

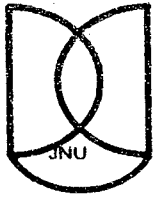
**PRIVATE INDUSTRIAL INVESTMENT IN INDIA:
TRENDS AND DETERMINANTS**

**Dissertation submitted to the Jawaharlal Nehru University
in partial fulfillment of the requirements
for the award of the degree of**

MASTER OF PHILOSOPHY

MANTHENA VARA PRASAD

**CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES
JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI-110067
INDIA
1999**




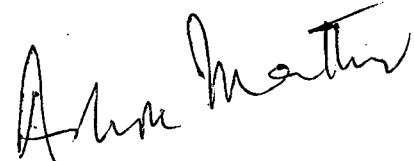
**JAWAHARLAL NEHRU UNIVERSITY
NEW DELHI - 110 067**

CENTRE FOR THE STUDY OF REGIONAL DEVELOPMENT
SCHOOL OF SOCIAL SCIENCES

CERTIFICATE

This is to certify that the dissertation entitled "PRIVATE INDUSTRIAL INVESTMENT IN INDIA: TRENDS AND DETERMINANTS" submitted by MR. M.VARA PRASAD in partial fulfillment of six credits out of total requirements of twenty four credits for the degree of Masters of Philosophy of the University is to the best of my knowledge a bonafide work and may be placed before examiners for evaluation.


CHAIRPERSON 16/6/99


SUPERVISOR

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For all the remaining errors and inadequacies in my dissertation, I am alone responsible.

NEW DELHI

M V Prasad
MANTHENA VARA PRASAD

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CHAPTER I

INTRODUCTION

The problem of capital formation has been central to development strategy for all less developed economies. The underdeveloped areas, as compared to the advanced areas, are under equipped with capital in relation to population and natural resources. Especially, the fluctuations in capital formation effect the economic development of these underdeveloped economies to a large extent. However, “capital is necessary but not a sufficient condition for progress”,¹ since the problem of economic development is also dependent upon human development, social attitudes and political conditions.

‘Capital formation’ , according to Nurkse , means that society does not apply the whole of its current productive activity to the needs and desires of current consumption, but directs a part of it to the production of capital goods, tools and instruments, machines and transport facilities, plant and equipment. All these are various forms of real capital that go to greatly enhance the capability and efficiency of the industrial sector.

Capital formation in general is defined as the addition to the capital stock at the end of the year, over and above the one which the economy inherited from the past at the beginning of the year.

¹ R. Nurkse, “*The problem of capital formation in under developed economies*”, Basil Blackwell, Oxford (1953), p. 1.

$$\text{i.e., } I_t = K_t - K_{t-1}$$

Where, I_t = Investment as in period t;

K_t = Capital stock in period t, and

K_{t-1} = Capital stock in period t-1

When stock of capital increases, naturally its technical form also undergoes changes. Capital changes its physical shape with the capital intensity of productions, i.e., value of capital per head increases whenever a shift towards technically upgraded machines takes place. This is in the very nature of capital which makes capital formation of prime importance, both for developed and underdeveloped economies. This is especially true of the period of economic crisis which is sweeping all round the world. A policy for long term growth can be guaranteed only through a steady rise in the rate of investment and a decline in capital-output ratio. In over-populated underdeveloped economies, where the increase in per capita output is related to increase in capital labour ratio, there arises a need for large net investment with low capital – labour ratio in case of the high population growth rate in a good many of the LDCs. With insufficient savings or inadequate quantum of investment because of low per capita income, the only solution would be rapid rate of capital formation.

Keeping in mind the above problem most of the economies during their earlier stages of development laid emphasis on public investment in the hope that it will act as a stimulus to investment activities and hence will enable the economy to attain a higher rate of investment, which is a

prerequisite in Harrodian growth model as well as in other growth theory. The argument was that it will crowd in private investment and raise the productive capacity in the economy and also help maintain stability in aggregate demand which is considered to be very important in the Keynesian view. Public investment has a considerable positive effect in production and hence in generating overall investment and demand. But these days, with dwindling faith in the relevance of Keynesian constraint on growth, namely, the demand constraint, the emphasis has shifted towards the supply side of the argument for adjustment. Unilaterally, government budget has become an important policy tool.

Before we inquire into the consequences of these policies, one needs to answer the question as to what determines the investment behaviour in a developing economy. For this study it is necessary for us to look in depth at the historical roots of economic development in both developed as well as developing economies and capture the process of transformation in developed economies so that the key factors in the transformation of developed economies may be applicable to developing economies.

HISTORICAL BACKGROUND

The developing economies have a dual economic structure with one sector of the economy flanked by a modern capitalistic system of production and a vast unorganised sector basically having low rates of growth, low marginal productivity and thus they lag behind the developed economies. The accumulation process is centre-specific with advanced regions being located in ports which are linked to a

mineral-rich area or a plantation based agglomeration, with the surplus being extracted in its raw form and exported to the advanced core.

The level of accumulation itself is very low with subsistence of backward sectors characterised by pre-capitalist mode of production and employing large population which consists of peasants, artisans, etc. They are exploited physically and mentally by landlords and moneylenders, while the advanced sector caters to the elite class. These economies export raw materials and import manufactured products from the advanced countries. They are also saddled with a lopsided infrastructure, poor transport facilities and so on. Thus, the economy revolves round the system of extraction of surplus, its accumulation in the form of savings, and investment in a form which would generate high rates of growth.

In the advanced capitalist countries, especially in Britain, there was a transformation in the production relations with the rise of the factory sector termed 'industrial revolution'. This system catered to the needs of ever expanding market with changing modes of production emphasizing more on specialisation and division of labour. With machine production becoming the order of the day, there began the development of infrastructure in the form of railways, roadways and waterways which reduced the transportation costs. However, the most fundamental change occurred in the monetary relations, when money exchange became the medium through which labour power was transacted for wages. Initially British industry, notably, cotton developed under tariff protection; but as machines production became more important and the size and scale of output expanded, the doctrine

of free trade market took over the reins. The main logic was to keep profits high and to have a large market. The wages were kept low at a subsistence level and the terms of trade with the colonies were kept in favour of Metropolitan countries from whom the raw materials were imported. This gave birth to free market which is the product of neo-classical economics. The crux of this theory rests on the maximising principle. Trade should be free and cost-competitive with regions specialising in the production of those commodities in which they had comparative advantage. Any attempt to impose restrictions was supposed to lead to a perverse allocation of resources resulting in loss of consumer and producer surpluses. Accordingly, market for labour and capital should also be let free, with each factor being paid value equal to its marginal product.

ROLE OF MANUFACTURING SECTOR IN ECONOMIC DEVELOPMENT

It is worth noting that in the process of development in the developed economies there is a major role played by the manufacturing sector. From Yotopolous and Nugent (1975)² study of linkages for developing economies we can conclude that manufacturing vis-à-vis agriculture possesses greater linkage potential. The greater the linkages, the greater the externalities and hence higher the pace and level of industrialisation. Kaldor (1961)³ concludes from his study of developed countries that it

² P.A. Yotopolous and J. B. Nugent, "A Balanced growth version of the linkage hypothesis-a test", *The Quarterly Journal of Economics*, 1977, vol. 87, no. 2, p. 157-174.

³ N. Kaldor, "Economic growth and the problem of capital formation", *Economics*, 26, August-November 1959.

is the growth of manufacturing sector that causes the growth of Gross Domestic Product. He finds that only in manufacturing sector there exist dynamic returns.

The other more important cause could be by strengthening of capital goods sectors- besides being a supplier of goods to different sectors in the economy, it also acts as a potent mechanism for generating and transmitting technical change.

More importantly, the rise in the productivity in manufacturing sector raises productivity in agriculture through the absorption of surplus labour off the land and in services because of increased output of the distribution sector. Thus the case for industrial development is strengthened with the growth of manufacturing as a key explanatory variable on the road to development.

The studies by Kuznets (1955)⁴, Hoffman (1958)⁵, Chenery (1955⁶ and 1979)⁷ and Sutcliffe (1971)⁸ have pointed out how the accumulation process was related to higher rates of growth of GNP and per capita income. The erstwhile socialist countries which had opted

⁴ S. Kulnets, "*Economics growth and income inequality*", American Economic Review, 1955, vol. 45, no. 1, p. 1-28.

⁵ W.G. Hottman, "*The growth of industrial economics*", 1958.

⁶ H.B.Chennery, "*Structural change and development policy*", 1979.

⁷ H.B.Chennery and H. Surquin, "*Patterns of development 1950-1970*", 1975.

⁸ R.B. Sutcliffe, "*Industry and Under development*", Addison Wesley Publishing Company London 1971.

for planned development programme and a policy of State intervention attained high levels of industrial growth in their initial stages of development. In fact, double the pace of growth of other industrialised countries was brought about by these countries.

A CASE FOR PRIVATE INDUSTRIAL INVESTMENT

From the proceeding discussion we can conclude that there is a crucial role played by manufacturing sector in the process of growth of developed economies. This need for growth of manufacturing sector demanded that large investments be made in manufacturing sector by developing economies, which can only be accompanied through state intervention in developing economies to catch up with the developed world. The strategy of development planning initiated by the developing economies for growth with social justice and to achieve balanced regional development is laudable. However, policy of import substitution is facing increasing criticism with the emphasis shifting away from the goal of achieving efficiency. For the developing economies which are still dependent for technology and capital on developed ones, It is important for them to follow liberal policies towards imports of capital goods.

With the advent of debt crisis in most of the developing economies there has been a radical change in the development strategy. Instead of concentrating on inward-oriented growth strategy, under the guidance of State directed investment, the new growth model is outward-oriented in nature and more specifically heavily reliant on market forces. Again as a

stabilisation measure in these economies there is a call for cut in public expenditure. This policy of streamlining the role of public sector is the result of past inefficiencies generated by the public sector in an attempt to indulge in too many investment activities through public enterprises in direct production of goods. More importantly, the expenditure cut is necessitated for overcoming the problem of rising fiscal deficit which is the product of lack of internal and external resources available to the government. Thus arose the urgency to encourage private investment, especially in manufacturing sector, in the process of stabilising these economies by way of raising Gross Domestic Product in manufacturing sector and in generating employment growth.

In the light of the problem of developing economies, characterised by demand and supply constraints and in the presence of structural and institutional factors like the absence of a well developed financial market, strategic role given to public investments in capital formation and administered interest rate regime, we shall make an attempt to study the private industrial investment scenario in India, its growth trends, and shall try to identify the major factors influencing the private industrial investment behaviour. We shall also examine regional disparities in industrial investments in the context of goal of balanced regional development.

OBJECTIVES OF THE STUDY

The specific objectives of the present study are:

1. to examine the trend and pattern of growth in private industrial investments during 1980 to 1994;
2. to ascertain whether the acceleration principle or past profits explain the movements in private investment in manufacturing factory sector;
3. to investigate whether public investments in industry crowd in or crowd out private investment;
4. to observe the impact of financial variables in inducing investments by private sector;
5. to check the regional disparities in industrial investment, if any, and suggest some remedial measures to correct the disparities if they exist.

METHODOLOGY

We shall use the Ordinary Least Square regression for estimation during the period 1980-81 to 1993-94.

The next chapter develops a model to study the determinants of private industrial investment under a modified flexible accelerator framework..

We shall estimate the equation for private fixed investment taking disbursements by All Financial Institutions, public investment, demand conditions and lagged private investment.

We also make use of the statistical tools like ratios, percentages etc.

For computing compound growth rates we use the following methods.

$$P_t = P_0(1+r)^t$$

Where P_0 = value in the base year,

P_t = value in the terminal year,

r = growth rate and

t = numbers of years.

For estimating trend rate of growth we used a semi-log linear regression model as follows :

$$\text{Log } Y = \alpha + \beta t$$

Where Y = value of any variable over time,

t = time and

β = trend coefficient.

To observe the regional disparities we used Hirschman-Herfindahl Index (HH).

$$HH = \sum_j P_{x_j}^2 / 100$$

Where P_{x_j} = Proportion of state j in the aggregate of the variable x .

DATA SOURCE

Annual survey of Industries (ASI) data of summary results of (factory) sector a two digit level of National Industry Classification has been used for 18 industrial sectors covered in the study. The analysis spatial as well as temporal, have been done in terms of variables like investment, defined as change in fixed capital plus depreciation and value added. The other major source of data is Centre for Monitoring Indian Economy (MIE) . Economic Intelligence Service and Investment Intelligence service volumes. The price deflators are taken from H.L.Chandhok , India data base. Economic survey and RBI Bulletin data have also been made use of. Data regarding disbursements from All Financial Institutions to Public and Private sector has been taken from Reports of Development Banking of Industrial Development Bank of India (IDBI) and that of disbursement from scheduled Commercial Bank (SCPS) to major states has been collected From National Informatic Centre, Hyderabad

PLAN OF THE STUDY

The scheme of the study is as follows. Chapter 1 deals with an introduction to this study. Chapter 2 summarizes the recent literature on factors affecting investment behaviour in the manufacturing sector and develops a model to estimate the major demand and supply factors influencing investment behaviour by investors of the private sector. Chapter 3 is devoted to a discussion of the industrial development planning strategies since the inception of planning to the 1990s. The relevance of the private sector investment in the Indian manufacturing sector's role in the growth and development of the Indian economy is also discussed. This is followed in Chapter 4 by an analysis of trends in investments in Indian industry and identifying the major factors influencing investments in that sector. A similar study is made at the regional level in chapter 5 and chapter 6 forms the main conclusions of this study.

CHAPTER II

REVIEW OF LITERATURE AND THE MODEL

Various theories of economic development like 'big push', 'critical minimum efforts', 'balanced' and 'unbalanced growth',¹ which have come to dominate the development economics in post-World War II period, laid emphasis on the rate of investment as a crucial factor of economic development. Thus, many economies have resorted to huge public expenditure in financing investment. But the biggest problem for developing economies is the scarcity of capital. In the previous chapter we have discussed the issue of public expenditure and the need for expenditure cut to overcome the problem of rising fiscal deficit in the developing economies. In this connection the importance of private investment, especially in manufacturing sector is necessitated for the purpose of achieving higher growth in Gross Domestic Product. But the major problem area is how to encourage private investment. Very little work has been done in identifying the factors which promote private investment in industry. In this chapter we shall survey the literature at three levels, first we shall discuss the theoretical literature behind the formulation of private investment function, then we go on to studies

¹ Ragnar Nurkse, "Balanced Growth" in G.M. Meier (ed.), (1970); Tibor Scitovsky, Growth, "Balanced or Unbalanced" in M. Abramovitz (ed.), *Allocation of Economic Resources*, Stanford, 1959; S.K. Nath, *Theory of Balanced Growth*, *Oxford Economic Papers*, vol. 14 (2), 1962, pp. 138-153; Paul N. Rosenstein-Rodan, Problem of Industrialisation of Eastern and South Eastern Europe, *Economic Journal*, vol. 53, (1943), pp. 202-211; and Paul N. Rosentein-Rodan "Notes on Big Push", in Howard S. Ellis (ed.), *Economic Development in Latin America*, Macmillan, London, 1961, pp. 57-66.

relating to private investment in developing countries and finally we review the econometric studies in private investment in India.

In the next section it is proposed to discuss the important factors affecting the fixed investment behaviour by private sector. The role of accelerator and of financial variables is considered. Among the financial variables retained earnings i.e. profits and external finance are studied. In addition the influence of public investment in determining private investment is also captured. To analyse the private investment behaviour and economic model has been built covering all the above mentioned economic variables.

THEORETICAL FRAMEWORK

Private investments in a free enterprise economy is affected by several economic variables and the various theories of investment can be broadly grouped into three categories, such as (i) those based on the accelerator principle (ii) those based on profit and (iii) those emphasising the financial variables.

The accelerator principle as originally formulated by Clark J.M (1917)², assumes a direct and proportional relationship between investment and rate of change of output. This basic principle has been extended to relate investment to the prevailing rate of change of sales proceeds. However, the naive accelerator model assumes that there is no excess capacity and

² J.M. Clark, "Business Acceleration and the Law of Demand; A Technical Factor in Economic Cycles", *Journal Political Economy*, March 1917, 25(1), pp. 217-35.

technological development and the supply of capital goods is infinitely elastic. Chenery(1952)³ made a comparison of the accelerator principle and the 'capacity principle', the latter implying that investment may be assumed to be proportional to the difference between the amount of capital needed for current period and the optimum degree of utilisation of capital. It is the flexible accelerator hypothesis of D.W. Jorgenson (1965)⁴ with financial variables that has received considerable attention. This hypothesis implies that adjustment of capital stock to desired level is not instantaneous, unlike J.M. Clark's accelerator hypothesis. There are time lags between changes in demand and adjustment of capital stock to desired level. Such lags arise on account of technological factors, expectations and institutional factors.

Profit-Investment relationship has two variants. Timbergen (1939)⁵ and Klein (1951)⁶ argue that retained profits measure expected profits. That is to say that investment is governed by profits expectations. This theory cannot be fully distinguished from the accelerator theories as profits are some functions of the level of output or sales. The second version of the

³ H.B. Chenery, "Overcapacity and the Acceleration Principle," *Econometrica*, Jan. 1952, 20(1), pp. 1-28.

⁴ D.W. Jorgenson, "Anticipations and Investment Behaviour" in Duesenberry, J.S.; From, G.; Klein, L.R. and Kuh, E., eds. *The Brookings quarterly model of the United States*, Amsterdam: North Holland, 1965.

⁵ J. Timbergen, A method and its application to investment activity, League of Nation, 1939.

⁶ L.R. Klein, "Studies in Investment behaviour", in Conference on Business cycle, University-National Bureau Committee for Economic Research, 1951.

profit theory is that the past profits act as a source of internal funds. When the cost of funds become highly inelastic.

The third category of investment theory stresses the importance of financial factor, especially the rate of interest charged for money borrowed by firms. Although a focus on interest rate is needed for looking at the determination of investment decision in any time period, by drawing, a horizontal line at the prevailing market rate of interest to an intersection with the marginal efficiency of investment schedule, the influence of finance on investment goes far beyond the interest rate, there are other source of financing investment like equity financing, undistributed profits or depreciation allowances.

In the present study we have considered marketing borrowing and retain profits as a source of financing investment.

REVIEW OF INTERNATIONAL STUDIES

The study by M .M . Masih Abul (1979)⁷ examine whether there is any functional relationship between private investment and financial variables in case of Pakistan covering the period 1955-56 to 1969-70. He estimates the equation relating to private investment expenditure in the large scale manufacturing sector and for the private sector in total through the ordinary least square regression method. This analysis brings to light the significance of the variables emphasising the importance of the supply of

⁷ M.M. Masih Abul, Specification and estimation of private investment functions in develop economic with particular reference to financial variables, the case of Pakistan, Indian Journal of Economics, vol. 60(236), 1979.

investible funds, especially of the flow of commercial loan, rather than rate of interest, in determining the private investment function, both for private large scale manufacturing and whole private sector in Pakistan.

The study by U. Tun Wai and Chong-Hury Wong (1982)⁸ examines a modified version of the flexible accelerator theory of investment with reference to five developing countries. Greece, Korea, Malaysia, Mexico and Thailand during the period 1960 to 1974. The empirical results confirm that government investment, the change in bank credit to the private sector and capital inflow to the private sector play an important role in determining private investment.

M.J.Blejer and M.S.Khan (1984)⁹ also applied the modified flexible accelerator framework to 24 developing countries with data pooled over the period 1971-79. The results establish a link between government policy variables and private investment. The study emphasises the role of public investment in the process of private capital formation by making a distinction between long-run (infrastructural) and shortrun public investment. Moreover, this paper clearly highlights the constraints imposed by the availability of finance for the private sector in developing economies and suggests that monetary policy by varying the flow of credit to the private sector can directly change private investment decisions.

⁸ U.Tun Wai and C.Wong , "Determinants of private investments in developing countries " *Journal of Development Studies* (London), vol. 19, 1982.

⁹ M.Blejer and M.S.Khan , "Government policy and private investment in developing countries, IMF staff paper 3rd August 1984.

The latest work available on private investment is of Lawrence Burton and Morrise and Samuliski (1992).¹⁰ Their study relates to 31 developing economies covering period 1988-1994. The objective was to assess the impact of privatisation on private fixed investment. For this study they used an updated version of economic model of Greece and Villa Nuera (1991) covering period 1975-1987 for 23 developing countries. The results show that each percentage point increase in privatisation revenues (relative to GDP) defined as income from sale of state owned assets increases the ratio of private investment to GDP by 0.4 percentage points in the following year. More importantly, the positive and highly significant regression coefficient of the privatisation variables of their study suggests that privatisation has a positive impact on private fixed investment above and beyond the concurrent effects of macroeconomic stabilisation and other structural reform.

REVIEW OF INDIAN STUDIES

There have been some attempts to study the determinants of fixed investment in India. Most of the studies relate to private corporate sector. Some are time series and others are cross-section studies. First we shall review the macro economic studies dealing with issues of capital formation in explaining growth performance.

¹⁰ Mauris and A.Sumliski, "Trends in private investment in developing countries", International Finance Corporation, discussion paper -31, 1997.

Sundararajan and Thakur (1980)¹¹ deal with the specific issues of crowding out of private investment by public investment using a growth model. Their study is basically modified way of applying the neo-classical model to take into account some of the institutional and structural factors inherent in the economic system of India and South Korea. The period of study is from 1960 to 1976. Taking the rate of interest as the linking variable between real and monetary sectors of the economy, they obtained an indeterminate result explaining crowding out hypothesis with the coefficient of public sector capital stock in the private investment equation to be statistically insignificant in both the countries. The reason could be that administered interest rate regime in Indian case would not prompt the private investors to equate rate of interest and marginal efficiency of capital in investment planning. Krishnamurthy, Pandit and Sharma (1989)¹² emphasised on the supply side as the explanation for the growth performance while dealing with issues of capital formation, resource mobilisation, crowding out and inflation while studying the sectoral allocation of private investment.

$$\text{Zimcp/Zip} = 0.596 + 0.418 \text{ Zimcg/Zig} + 0.277 \text{ Zig/Zy} + 1.152 [\text{Zig/Zy} + D(162-76)]$$

$$= 0.436 \text{ Pag/P} \quad (1.39) \quad (0.35) \quad (4.24)$$

$$(2.20)$$

¹¹ V.Sundararajan and Subhash Thakur , "Public Investment, Crowdingout and Growth: A dynamic Model applied to India and Korea", staff papers IMF (Washington), vol. 27, 1980.

¹² K.Krishnamurthy and V.Pandit and S. D. Sharma, Parameters of growth in developing mixed Economy: Indian experience Journal and Quantitative Economics, vol. 5, no.2, July 1989.

Where $Zimcp$ = Real Private Investment in Manufacturing and Construction

ZiP = Total Real Private Investment

$Zimcg$ = Real Public Sector Investment in Manufacturing and Construction

Zig = Total Real Public Investment

ZY = Real Gross Domestic Product (Market Price)

$D(62-76)$ = Dummy variable (1961/62-1975/76=1, otherwise 0.)

Pag = Implicit Price Deflator for GDP (Factor Cost) in Agriculture and Allied Activities.

P = Implicit Price Deflator for GDP (Factor Cost)

They found that the stimulating role of public sector investment has weakened since mid-seventies in manufacturing sector, though their results showed a significant crowding in phenomena till mid-seventies. The problem in their analysis is that they have neglected demand factors which influence growth.

Since private corporate sector has a major role to play in private sector, we shall review some of the studies concerning private corporate investment in India. Among the time series studies Krishnamurthy's

(1964)¹³ investment functions are aggregative in character covering the entire private sector for the period 1948-61. Capacity utilisation, profits and long term rates of interest are found to be of some importance in determining private investment in machinery and equipment. The studies by Divatia and Athawale (1972)¹⁴ that of Swamy and Rao (1974)¹⁵ are aggregative and relate to the corporate sector. These studies cover the period 1958-70 and 1954-70 respectively. Divatia and Athawale conclude that a combination of accelerator and profits can explain gross capital formation adequately. The study by Swamy and Rao attempts an integrated treatment of the flow of funds and their uses. They infer that the accelerator, flow of funds, (internal as well as external), and capital intensity are significant determinants of corporate fixed investment. The attempts by Krishna and Krishnamurthy (1974)¹⁶ focusses attention on public investment as a determinant, among others of corporate fixed investment. The period covered is 1950-66. Public investment can be viewed as a surrogate for aggregate demand. They infer that public investment expenditure is an important determinant of corporate investment.

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- ¹³ K.Krishnamurthy, Private Investment behaviour in India - A series studies, Arthamiti, January 1964.
- ¹⁴ V. Divatia and A.G.Athawale, Corporate Investment behaviour in India - An Empirical Study paper presented at the Indian Econometric Conference, Dec 1972.
- ¹⁵ S.Swamy and V.G.Rao, The flow of funds in the Indian manufacturing sector, paper presented at Indian Econometric Conference, Jan 1974.
- ¹⁶ K.L.Krishna and K.Krishnamurthy, "Investment functions for the corporate sector" in towards and Econometric Model of the Indian Economy Part 3 report submitted to ICSSR Feb 1974..



The study by Sarkar (1970)¹⁷ examines bivariate relationship of investment with change in sales, lagged profits and interest rate for several individual industries for the period 1950-1965. Finite distributed lag models in sales change and in profits are also tried. The result suggests that profit-investment relationship is more pronounced than investment-sales relationship. Interest rate is found to be generally of no importance. Janeson paper covers twenty-five individual industries in the corporate sector and relates to the period 1951-66. The paper emphasises the user cost variable and concludes that it has a significant impact on the rate of investment in most of the industries. The study by Rama Rao and Anjaneyulu (1974)¹⁸ on the cotton textile industry relates to the period 1952-69. They have an investment equation in a model integrating output, utilisation of capacity and investment. Sales and capital stock at the beginning of the year are significant determinants of fixed investment. Patnaik's¹⁹ study for the period 50-65 relates to some individual industries and to the aggregate corporate sector as well. The study suggests that the rate of investment and the rate of profit are closely related, but this relationship is obscured by the operation of special factors in certain years; the inclusion of dummy variables to take account of such special factors goes a long way towards explaining investment movements.

¹⁷ D.Sarkar, "Capital formation in Indian Industry: An Empirical application of Investment theories", EPW, Feb 1970.

¹⁸ T.Ramarao and D.Anjaneylu, An Econometric model of the Indian cotton textile Industry, a study prepared in department of statistics RBI, 1974.

¹⁹ Prabhat Patnaik, Private Corporate Industrial Investment in India , 1947-67: Factors effecting its size, cyclical fluctuations and sectoral distribution, UN published Doctoral dissertation, University of Oxford.

The above studies are at constant prices except that of, Swamy and Rao, Sarkar and Patnaik. All the studies relating to the corporate sector have made use of consolidated balance sheet data published periodically by the Reserve Bank of India.

Out of the earliest cross section studies in the field of corporate investment in India the most notable work is by Bagchi (1962)²¹. His study is a cross section analysis across twenty seven industries covering such diverse activities like tea plantation, electricity supply and shipping. The unit of analysis is industry, Yearly cross section have also been tried. The consolidated balance sheet data of public limited companies published by the Reserve Bank of India have been used. Investment equation, one with sales change and another with profits separately using yearly coverages for the two periods, 1952-55 and 1957-59 have been tried. The broad conclusion of the study is that profits after tax has a more dominant influence on the level of investment than changes in sales. Patnaik estimates a simple cross section relationship using average data for the three samples of Reserve Bank of India series with industry as a unit of analysis. No significant relationship is found between the rate of investment and rate of profit.

The study by V.K.Sastry (1966)²⁰ is a major attempt to analyze investment, dividends, external finance and their interdependence for the

²¹ A.K.Bagchi, "Investment by Privately own joint stock companies in India", Arthamiti, July 1962.

²⁰ V.K.Sastry, Dividends, investment and external finance behaviour of the corporate sector in India.

corporate sector. The study is based on individual balance sheets of public limited companies and includes firms all the way from mining and manufacturing to public utilities with varying capital intensities. The analysis relates to yearly cross section for the period 1955-60. The variables in the fixed investment equation are accelerator represented by sales change, profits, dividends, liquid assets, debt equity, the flow of external finance and depreciation. Both the ordinary least squares and the two stage least squares estimates are presented. The least square estimates suggest that accelerator, profitability and the flow of external finance are the prime factors influencing investment expenditures. The two stage least squares estimates further reveal that dividends have a significant negative impact on investment suggesting competitiveness between dividend payments and investment expenditures. These cross section studies of Bagchi, Patnaik and Sastry ignore inter-industry differences. The studies by Krishnamurthy and D.U. Sastry (1971)²² and that of D.U. Sastry (1973)²³ are individual industry studies. Both the studies make use of individual company balance sheet data of public limited companies. The study of Krishnamurthy and D.U. Sastry analyse investment, dividends and external finance behaviour for the chemical industry on the basis of annual cross section for the period 1962-67. An attempt is made in their study to appraise the importance of accelerator, retained earnings and the flow of external finance in the analysis of fixed investment. The analysis reveals that accelerator hypothesis has some validity in the explanation of investment. Financial variables are of significance. Retained earnings exert influence on investment when the supply of funds is limited on account of poor profits. The impact of external finance is felt on investment when

²² D.U.Sastry, "Some aspects of corporate behaviour in India: Across section analysis of Investment, dividends and external Finance for the chemical Industry, 1962-67" IER Oct 1971.

²³ D.U.Sastry, Investment behaviour in the Indian capital goods Industry, IEG, Delhi, 1973.

money-capital markets are tight. The study by D.U.Sastry on capital goods industry relates to the period 1957-67 both cross-section and time series approaches have been used. Within the cross section analysis, several variants viz. single year cross section, two year aggregate, three year aggregate and pooled cross section have been tried. The cross section results lend support to the importance of retained earnings and external finance in investment decision. The accelerator does not seem to have any impact. Time -series results of individual companies confirm the importance of finance variables.

All the cross - section studies are at current prices . The cross- section studies except that of Bagchi, attempt to correct for heteroscedasticity deflating the variable by a size measure. In the studies of V. K. Sastry and that of Krishnamurthy and D.U.Sastry different size measures have been used to deflate different variables in the equation so that some of the deflated variables acquire economic meaning. The specific examples are deflation of sales change by sales, investment by capital stock and debt by net worth.

The time series studies of Divatia and Athawale, Janeson, Swamy and Rao, and Rama Rao and Anjaneyulu are in the framework of capital stock adjustment models. The cross-section studies generally attempt the analysis in the same framework and use finite distributed lags in sales. Both the cross-section and time series studies except (V.K.Sastry), one use the ordinary least square estimation procedure. In our study we shall use the modified form of flexible accelerator framework in explaining determinants of private investment in manufacturing factory sector. To proceed with this analysis we shall

build an economic model to capture the economic variables affecting private investment behaviour in Indian manufacturing 'factory' sector.

THE MODEL

Economists often question the validity of the standard neo-classical investment function in developing countries due to the presence of structural & institutional factors specific to these economies, which cause imperfections in product & factor markets. These factors are taken care of by the operation of a lagged model. There also exist data availability problems regarding capital stock in these economies. Further, they are bound by demand and supply constraints, which influence private investment. Keeping all these factors in mind, it is necessary to build a model to look at the private industrial investment behaviour in India, which has bearing on growth and development. The model is basically a flexible accelerator model with lags.

MODEL SPECIFICATION

Under a capital adjustment framework, actual investment is defined as the process of removing discrepancy between desired and actual capital stock. In case of actual investment in private sector the equation is written as :

$$\Delta KP_t = \lambda (KP_t^* - KP_{t-1}) \quad \text{----- (1)}$$

where KP_t^* = desired private capital stock

KP_t = actual capital stock

Since it takes time to plan, build and install new capital, we write in the above equation the adjustment in actual investment by private sector in period t (ΔKP_t) as the difference between the desired private capital stock in period t (KP_t^*) and the actual stock in the previous period (KP_{t-1}); where λ is the coefficient of adjustment with $0 \leq \lambda \leq 1$. Thus, from the above equation (equation:1) we define net private investment in any given time period t , as some fraction λ of the desired change for that period. Although theoretically it is possible for the actual capital stock to adjust instantaneously to its desired level ($\lambda=1$), or for no adjustment to take place at all ($\lambda=0$), in actual practice, it should lie between 0 and 1; implying the various constraints faced by the private investors in their investment decisions.

Equation (1) can also be written as:

$$KP_t = \lambda KP_t^* + (1-\lambda) KP_{t-1} \quad \text{----- (2)}$$

The above equation signifies actual capital stock in period t as a weighted average of the desired capital stock in that period and the actual stock in the previous period.

Now we look at gross private investment which is defined as net private investment plus depreciation of the previous period's capital stock, that is,

$$IP_t = \Delta KP_t + \delta KP_{t-1} \quad \text{-----(3)}$$

Where δ is the rate of depreciation of capital-stock.

With the application of lag operation,

$$IP_t = [1 - (1-\delta)L] KP_t \quad \text{-----}(4)$$

where L is the lag operator with $LKP_t = KP_{t-1}$

From equation (4) we write

$$KP_t = IP_t \div [1 - (1-\delta)L] \quad \text{-----}(5)$$

Substituting the values of KP_t and KP_{t-1} in equation (2)

we get,

$$IP_t \div [1 - (1-\delta)L] = \lambda KP_t^* + (1-\lambda) [IP_{t-1} \div \{1 - (1-\delta)L\}]$$

$$\Rightarrow IP_t = [1 - (1-\delta)L] \lambda KP_t^* + (1-\lambda) IP_{t-1} \quad \text{-----}(6)$$

Under long run representation of accelerator model, we assume that the desired capital stock is proportional to the level of expected output. So,

$$KP_t^* = \beta Y_t^* \quad \text{-----}(7)$$

where β is a constant.

Here, Y_t^* is the expected level of output corresponding to KP_t^* . This is quite a standard formulation and can be rationalised by assuming the underlying production function has (technologically) fixed proportions among factor inputs, so that factor prices do not enter into the specification.

Now by substituting equation (7) in equation (6) we get the expression for a basic accelerator model for gross private investment as :

$$IP_t = \beta \lambda [1 - (1 - \delta) L] Y_t^* + (1 - \lambda) IP_{t-1} \quad \text{-----}(8)$$

Another way of deriving the above equation, i.e., (8) is by directly specifying a partial adjustment function for gross investment as follows:

$$\Delta IP_t = \lambda (IP_t^* - IP_{t-1}) \quad \text{-----}(9)$$

Where, IP_t^* is the desired level of private investment. In the steady state, desired private investment is given by :

$$IP_t^* = [1 - (1 - \delta) L] KP_t^* \quad \text{----}(10)$$

Combining the equation (9) and equation (10) and solving for IP_t then yields an equation exactly same as the one in equation (6). By substituting in equation (6) for $KP_t^* = \beta Y_t^*$, we get equation (8). The above factors, namely, lagged investment (IP_{t-1}) and change in output ($\Delta \beta Y_t$) will exert an influence on the demand side of investment and generate the prospects for profits. We have noted from the profit theory of Tim Bergen (1939) and Klein (1951), that realised profits (past or present profits) measure expected profit. Though, this theory cannot be distinguished from accelerator theory, profits will remain the major source of internal finance for investment. Thus we write expected private investment as a function of present and past profits.

$$IP_t^* = \alpha_1 P_t^* + \alpha_2 P_{t-1}^* \quad \text{-----(11)}$$

Where P_t = profits in the current period t

P_{t-1} = profits in the previous period $t-1$

Now by substituting for IP_t in equation (9),

$$IP_t = \lambda \alpha_1 P_t + \alpha_2 P_{t-1} + (1-\lambda) IP_{t-1} \quad \text{---- (12)}$$

combining equation (8) and (12) we get,

$$IP_t = \lambda [1 - (1-\delta) L] Y_t^* + \lambda \alpha_1 P_t + \lambda \alpha_2 P_{t-1} + (1-\lambda) IP_{t-1} \quad \text{---(13)}$$

Since the principal constraint on investment is the size rather than cost of financial resources for developing economies, we examine the effect of the flow of bank credit to the private sector. An increase in real credit to the private sector will in general, encourage real private investment.

$$\text{We write, } IP_t^* = \alpha_3 \Delta DFI \quad \text{----- (14)}$$

Where DFI = Disbursement from All Financial Institutions

Combining , equatoin (13) with (14),

$$IP_t = \lambda [1 - (1-\delta) L] Y_t^* + \lambda \alpha_1 P_t + \lambda \alpha_2 P_{t-1} + \lambda \alpha_3 \Delta DFI \\ + (1-\lambda) IP_{t-1} \quad \text{----(15)}$$

Finally, it is a well accepted proposition that in developing countries, private and public investment are related, although there is considerable uncertainty about whether, on balance, public sector's investment raises or lowers private sector investment. We examine this issue in the context of industrial sector in India. In broad terms, public sector investment can cause crowding out if it utilises scarce physical and financial resources that would otherwise be available to the private sector, or if it produces marketable output that competes with private output. Furthermore, the financing of public sector investment -- whether through taxes, issuance of debt, or inflation -- will lower the resources available to the private sector. On the other hand public investment in infrastructure and public goods can enhance the possibilities of private investment and raise the productivity of capital, increase the demand for private output through increased demand for inputs and ancillary services. To capture whether there is crowding out or crowding in manufacturing sector, desired private investment is expressed as a function of real public investment.

By this formulation the final equation representing gross private investment would become :

$$PI_t = \lambda \alpha_0 \Delta GDMP_t + \lambda \alpha_1 P_t + \lambda \alpha_2 P_{t-1} + \lambda \alpha_3 \Delta DFI + \lambda \alpha_4 GI_t + (1-\lambda) IP_{t-1} \quad \text{-----}(16)$$

Where $[1 - (1 - \delta) L] Y_t^*$ is written as ΔGDMP_t in order to overcome the unobservable nature of this variable expected output the above equation is formulated. Here GI_t represents the real public investment in time period t : ΔDFI implies change in bank credit to private sector and ΔGDMP_t is Gross Domestic Product in manufacturing sector in time period t .

CHAPTER III

A REVIEW OF DEVELOPMENT PLANNING STRATEGY IN INDIAN INDUSTRY

In the present chapter, we discuss the role of development planning in Indian industry. In this direction, we look at the contribution of public sector, with emphasis on public investment in manufacturing sector. An attempt is also made to study the change in industrial structure as a result of the planning process. The share of industrial investments in manufacturing sector during planning period and the rising incremental capital-output ratio in manufacturing sector, are also studied. In the final section, the case for private investment in manufacturing sector is discussed.

Indian planning, subscribing basically to a supply side view of the planning problem, has not paid much attention to the fact that, domestic demand can possibly be a constraint on the growth process. The rationale behind this notion is the emphasis on higher public investment to overcome the possible blocks in the economic system. (Please refer to Table-3.1). The next section studies the role played by public sector in India's industrial development.

THE ROLE OF PUBLIC SECTOR

The Nehruvian philosophy has guided the planning strategy for economic development; the prime importance being given to industrial sector in the second plan. The state has influenced the pattern of

industrialisation not only through the controls over foreign trade and investment but also through participation in direct production activity. The heavy presence of state owned enterprises in the capital goods sector is a characteristic feature of India's industrialisation. Table 3.1 shows the extent of state participation in the manufacturing activity. The public sector accounted for more than 50 percent of the outlays. Ear-marked for the manufacturing sector, in the various Five-Years plans up to mid 1970's.

The economic rationale behind state participation was that, the private sector would be unable or unwilling to meet the size of investment required and bear risks involved in a large scale development programme.

The objective of rapid growth in industry, with special emphasis on heavy-basic and capital goods industries received primary importance, hoping that this will transform the spurt in savings into additional real investment. A look at the sectoral shares in total investment suggests that the manufacturing sector's share is maintained around 26 percent, except for the Fourth five year plan, when its share fell to 23.4 % (Table I). In the year 1977-78, the public sector accounted for 31 percent of the total gross domestic capital formation in the manufacturing sector. Its contribution to the total GDP, originating in the manufacturing sector, however, is relatively low around 14.4 percent. In terms of sectoral composition of investment in the State Owned Enterprises, Steel predominates, (29%) followed by minerals and

TABLE 3.1
Plan-wise distribution of investment

(percentage)

Plan	Organised industry and mini			Total plan		
	Public	Private	Total	Public	Private	Total
First						
Second	870 (56.3)	675 (43.7)	1545 (100)	3731 (54.6)	3100 (45.4)	6831 (100)
Third	1700 (61.8)	1050 (38.2)	2750 (100)	7,180 (63.7)	4,100 (36.3)	11,280 (100)
Fourth	3298 (62.2)	2000 (37.8)	5298 (100)	13,665 (60.03)	8,980 (39.7)	22,635 (100)
Fifth				36,703 (57.6)	27,048 (42.4)	63,751 (100)
Sixth				84,000 (53)	74,710 (47)	1,58,710 (100)
Seventh	42,435 (40.6)	62,172 (59.4)	1,04,627 (100)	1,54,218 (47.8)	1,65,146 (52.2)	3,22,366 (100)
Eighth	47,100 (25)	1,41,300 (75)	1,88,400 (100)	3,61,000 (45.2)	4,37,000 (54.8)	7,48,000 (100)

Note : Figures in parentheses are percentages

Source:1. J.C.Sandesara. Industrial growth in India-"problems and prospects",
IEJ,Vol.30,no20
2 Sixth, Seventh and Eighth Five Year Plan documents,Vol.1.

metals (23 %), Chemicals (24%) and engineering industries (10%) [V.N. Balasubramanyam (1984)].¹ This policy of encouraging public investment, has resulted in diversifying the structure of manufacturing sector relatively quickly which is studied in the next section. Further, India has become one among the few developing economics possessing a sophisticated modern industrial structure, despite the low level of per capita income.

INDUSTRIAL STRUCTURE

In 1957, the traditional textile and food industries, accounted for 67 percent of the total manufacturing sector output . Their share declined to 35 percent by 1978-79. On the other hand, the share of chemical and engineering industries increased from 14 to 51 percent over the same period, (V.N.Balasubramanyam).²The import substitution policies were instrumental in affecting the change in the industrial structure . Detailed estimates by Padma Desai, based on alternative measures of import-substitution, show that while the First five-year plan years were marked by a high degree of import-substitution in consumer good industries, the second five-year plan year, were marked by a high degree of import-substitution in consumer good industries, The second Five year plan years were marked by a high degree of Import-substitution in capital goods and intermediate goods industries. Thus in mid-sixties, there was not much change in the industrial structure.

¹ V.N.Balasubramanyam, The Economy of India, International Economic Series, 1984.

² Ibid., p. 112.

The pre-1970 period saw the era of inward looking policies of import-substitution and self-reliance. The reasons for structural backwardness underlying this strategy of development planning were:

- (1) The problem of shortage of capital has prevented the introduction of more productive technologies which could prompt industrial development.
- (2) Low capacity to save due to low per capita income has resulted in slowing down the speed of capital accumulation.
- (3) Though capacity to save could be raised by suitable fiscal and monetary policies, there were structural limitations like an underdeveloped financial market preventing conversion of saving into productive investment, and
- (4) The surplus labour under employed in agriculture which was subject to secular diminishing returns, would be more productively employed in industries if industries exhibited increasing returns to scale. Thus, a high sectoral-linkage with surplus labour has added to the problem of rising unemployment with industry experiencing decreasing returns to scale.

THE IMPORT-SUBSTITUTION STRATEGY

The main policy instruments of the import-substitution strategy were tariffs and quantitative restrictions on imports, Coupled with a detailed system of foreign-exchange allocation and a complicated system of industrial licensing. The basic objectives of this kind of strategy were to regulate industrial investments according to plan priorities, limit the

concentration of ownership of industries, protect and promote small-scale industries , and to promote balanced regional development. The result of this strategy, as concluded by Bhaghavati and Desai, from their analysis was that the industrial licensing and import control policies served to eliminate competition to existing firms from both domestic rivals and imports ; and that the policy of allocating import licenses on the basis existing capacity had created an artificial and wasteful incentive to overbuild capacity. Further , the policies had imparted a bias in favour of producing for the relatively profitable domestic markets, and against exporting . In sum , the policy instruments , far from promoting the stated objectives , had contributed to wide spread economic inefficiencies in resource allocations , increased concentration of incomes and wealth and slow growth in employment.

The achievements of the policy regime were that the industry economy of the country was built with the help of the public sector as the private sector did not have the resources to undertake infrastructure projects, like the Bhakra Hydro-electric Power project, the Bhilai Steel Plant and the like. Thus, a need for basic infrastructure industries for the foundation of a modern industrial economy was felt, and steps were taken in this direction. An industrial base has been built with the setting up of key industries with foreign collaboration. A mixed economy approached has therefore become inevitable for rapid growth and development. Thus, the policy regime of development planning before 1970, has laid foundation for industrial development and created a base further growth potentialities.

A new growth paradigm emerged in mid – 1970s, as economists started realising the benefits of an open economy. The weak industry-agriculture linkage caused a shift from import-substitution policies of industrialisation to export-led growth. Thus it seems it supported Kaldor's argument of shifting emphasis to industrial production, once the demand constraint for agricultural growth was met. The aim of the new strategy, i.e., to attract large volume of foreign capital and make the balance of payments position strong, failed to succeed despite considerable diversification of export basket and faster rate of growth of non-traditional manufacturing over total exports. The reasons for this failure were the problems like tied aid, the import of old technologies, poor maintenance and replacement, infrastructure bottlenecks, and inability to raise productive capacity which resulted in India becoming a high cost economy. Thus we find a need to improve the productive efficiency of industry in particular and reduce the cost of productive to compete in the world market.

GROWTH PERFORMANCE

Now we shall witness the effects of these policies on the growth performance of manufacturing sector. From table-3.2, we can discern that the growth rate of Gross Domestic Product (GDP) in general and GDP in manufacturing sector in particular, fell in the first two decades of planning, from 3.63 to 3.24 and 6.11 to 4.77 respectively. This scenario continued in respect of GDP in manufacturing sector in subsequent five-year plans.

Table.3.2

SECTORAL RATES OF GROWTH OF GROSS DOMESTIC PRODUCT IN THE INDIAN ECONOMY, 1950/51 TO 1983/84 (%)

Sector	1950/51 to 1959/60	1960/61 to 1969/70	1970/71 to 1979/80	1980/81 to 1983/84	1970/71 to 1983/84
Agriculture (crops and livestock)	2.61	1.37	2.31	3.96	2.27
Mining	4.81	5.24	4.33	10.53	5.14
Manufacturing	6.11	4.77	4.75	3.25	4.21
All sectors	3.63	3.24	3.76	4.98	3.81

Source:- Development Planning(1987S.Chakravarty;)

A major cause for this industrial slow down (as some economists like Srinivasan and Narayana pointed out) was the decline in public investment. This phenomenon of decline in public investment (as seen from Table-3.1), is observed after the fourth plan. Nayyar, explained it in terms of a shrinking home market for industrial output i.e., demand constraint on growth. Prabhat Patnaik , on the other hand, put responsibility on the speculative activities of the private sector, comprising the agricultural landlords and the industrial capitalists. In Desai's view, it was inefficiency in the resource use that caused stagnation. In general wrong projection of demand , inappropriate technology and slowdown in the rate of increase of real public and private investment, prevented scale economies to reap the benefits.

We shall now discuss the efficiency of resource use in the growth process. As an indication to the growth process, many planners hinted at the sharp increase in the incremental capital output ratio (ICOR) from 1950s to 1980s. Studies by V.K.R.V. Rao, Sukhmoy Chakravarty and K.N. Raj are worth noting in this direction. While Chakravarty's inference runs in terms of declining investment productivity, Rao attributes it to an uneconomic policy in capital formation that could not produce the desired impact on growth. V.K.R.V Rao states that "It is clear from our analysis that the policy we have followed for capital formation during this period, from the point of view of maximising productivity and the impact on growth, has been erroneous."* The high rate of savings witnessed during 1951-1952 to 1983-84 could not accelerate the rate of growth of GDP correspondingly. Thus, we can conclude that there is a decline in investment productivity. To K.N. Raj, such a rise in ICOR has been an almost universal phenomenon for many developing economies. A study at sectoral level of the ICOR is necessitated in this direction.

From the above table, we can conclude that there is a continuous rise in ICOR in all sectors, especially in the manufacturing sector. The ICOR in this sector rose from 4.47 in 1951/52 - 1959/60 to 14.36 in 1980/81 - 1983/84, the higher ICOR compared to other sectors. The cause may be that, heavy public investment in capital goods industries during the planning period, prompted use of capital intensive technology. Also, the rise in wage rate has caused a shift from labour intensive to capital

* Sentence taken from S. Chakravarty, Development Planning: the Indian experience, 1987.

Table 3.3

ESTIMATES OF SECTORAL INCRIMINAL CAPITAL-OUTPUT RATIOS IN THE INDIAN ECONOMY, 1951-84

Sector	1951/52 to 1959/60	1960/61 to 1969/70	1970/71 to 1979/80	1980/81 to 1983/84
Agriculture (crops and Livestock)	2.18	3.23	4.22	3.17
Mining	2.59	5.62	14.56	9.98
Manufacturing	4.47	6.49	8.20	14.36
Other sectors	5.85	5.31	5.78	4.43
All sectors	3.93	5.93	5.97	5.16

Source:- as in table3.2

intensive technology. A rise in the cost of capital, with a rise in price of imports especially after 1980s, would have led to a rise in capital-output ratio. When we look at the structural ratios in public sector and private sector industries (Table-3.4), we can observe that an increase in capital intensity of capital used in public sector industries is several times that of private sector, which also is characterised by a capital intensive nature of industrial investment. Capital-output ratio is four to five times more in public sector industries. Net output is higher in the public sector (in terms of per unit of gross output) by about one-third. From Table 3.4, we also discern that the fixed capital to labour ratio is higher in public sector than in private sector. It stands at 80959 in public sector and at 12039 in private sector in 1978-79.

Indeed the public sector employs more than 70% of fixed capital, it contributes only 40% of total output. On the contrary more than 60% of employment, gross output and value added is generated by factories in

the private sector who employ only 30% of fixed capital. It seems that the capital intensity is higher in public sector than in private sector. The cause may be that the higher prices of capital goods might have resulted in public sector experiencing higher capital-output ratio.

Table.3.4

STRUCTURAL RATIOS IN PUBLIC AND PRIVATE SECTOR

		PUBLIC SECTOR	PUBLIC SECTOR	PRIVATE SECTOR	PRIVATE SECTOR
		1975-76	1978-79	1975-76	1978-79
Fixed capital/ employee	Rs.	54311	80959	10860	12039
Value added/ employee	Rs.	11254	14533	9587	12496
Fixed capital/ gross output ratio	Rs.	1.29	1.48	0.23	0.20
Fixed capital/ net output ratio	Rs.	4.83	5.57	1.13	0.96
Net output/ gross output ratio	Rs.	0.27	0.27	0.20	0.20

Source: Economics of Indian Industry: A.K. Mukherjee (1985)

From Ashok .V. Desai's (1981)³ analysis of average capital –output ratios in Government and in public limited companies during 1960-61 to 1975-76, we come to know that capital-output ratios are higher in the public sector than in the private sector in the same industries.

There was some improvement in the efficiency of public sector manufacturing investment also. But in absolute terms, such investment remained heavily unproductive. Available estimates of net rates of return for the periods 1960-75 and 1976-86 show that returns on private sector manufacturing investment between these two periods, increased from 7.7% - 11% (depending on whether an allowance is made for improvement in the quality of labour) to 16.7%-22.6%. The comparable figures for public sector manufacturing were 0.1%-2.1% and 3.1%-5.2% for the two periods respectively. The contribution of public sector manufacturing investment to the evaluation of industrial and economic growth in the eighties was thus relatively small.

The factors contributing to the decline in the productivity and profitability of the public sector are very well summarised by Bimal Jalan (1996)⁴. The Government at the Centre and in States, became heavily involved not only in planning and guiding investment priorities , but also in actually managing enterprises. Since most public sector enterprises operated as monopolies, without internal or external competition, there was no financial accountability or pressure to generate profits. The

³ Ashok V. Desai, "Factors Underlying slow Growth of Indian Industries", Economic and Political Weekly, Annual No., March 1981, pp.381-92.

⁴ Bimal Jalan, India's Economic Policy : Preparing for the Twenty first Century, Viking Publisher, 1996.

Government became the sole source of funds for investment and the sole arbiter of how public sector resources were to be used. The sector also became overtime, the principal source of providing fully secure jobs, at wages which were rising faster than elsewhere in the economy. Multiplicity of trade unions owing allegiance to different political parties, emerged in different plants. This had the effect of further politicising the public sector and placing a discount on productive efficiency. The result thus was a low contribution to saving from public sector. After 39 years of planning, the public sector contributes only 8% of the nation's savings; that also, in part, through heavy taxation and semi-fictitious profits of the Reserve Bank. The remaining 92% of the nation's savings comes from the private sector. Thus, the Government resorted to more and more borrowings, rather than depending on its own savings from financing public investment.

Thus, it is evident from the above analysis that in the Indian planning process, public investment throughout was the driving force behind the general strategy of import-substitution industrialisation. The planning and policy makers were of the view that investment played a crucial role, not only as a component of final aggregate demand, but also in terms of determining the size of the country's capital stock, thereby influencing its future source of growth and employment opportunities. It was also generally believed that private investors would be reluctant to provide required resources to key industrial channels because of the country's lack of social and economic infrastructure, fully developed markets for equity, insurance and information. Therefore, absence of Government investment in infrastructure and basic industry with their positive

spillover effects , were viewed as necessary by policy makers for achieving optimal rates of investment and growth.

However, with the onset and aftermath of the debt crisis in 1991, there has been a radical change in the overall development strategy. Instead of concentrating on inward-looking growth strategy under the guidance of the State directed investments, the new growth model is outward looking in nature and more importantly, heavily reliant on the market forces , as evidenced in the ongoing deregulation of product and factor markets and privatisation of the most State owned enterprises. Again, as a stabilisation prescription, there is call for a public expenditure cut. This unprecedented move in streamlining the role of public sector can partially be attributed to the limited internal and external resources available to the Government, during the 1980s, but more importantly, it is viewed as the result of past inefficiencies and failures generated by the public sector's attempt to indulge in so many investment activities, through public enterprise in direct production of goods, competing with the private sector.

Thus, there arises a need to encourage private investments in manufacturing sector from an angle of profitability and productivity to boost economic growth as a source of providing employment. It is important to take note of the factors determining private investment in manufacturing sector as they are responsible towards facilitating private investments on a large scale. In this direction we shall next observe the growth pattern of private investment in industry during the period for 1980 to 1994.

CHAPTER IV

AN ANALYSIS OF PRIVATE INVESTMENT IN THE MANUFACTURING SECTOR IN INDIA

INTRODUCTION

In order to sustain the ongoing process of liberalisation and opening up of the economy, the need for a fresh focus on the performance of industrial sector in general and private industrial investment in particular cannot be overemphasised. The period of study, i.e., from 1980 to 1994, shows large fluctuations in private investment, which can be explained through an analysis of disbursements by All Financial Institutions, Public Investment, Demand Conditions and Lagged Private Investment.

INVESTMENT GROWTH IN MANUFACTURING SECTOR

Data on investment, defined as change in fixed capital plus depreciation of current year have been taken from the Annual Survey of Industries (ASI) and deflated by price index of machinery and equipment (data taken from H.L.Chandhok and RBI bulletin). The annual compound growth rates of private investment, public investment and total investment in the manufacturing sector, between 1981-85, 1986-90 and 1991 - 94 have been given in table 4.1. We observe from the table, that the rate of private investment was higher during all the sub-periods as compared to rate of public investment. This can be attributed to a significant improvement in the investment climate. The liberalisation of industrial and trade policies during this period, seem to have resulted in a large increase

Table- 4.1

Growth of Investment in Manufacturing (Factory) Sector

	1981-85		1986-90		1991-94		1981-94	
	Trend	CAGR	Trend	CAGR	Trend	CAGR	Trend	CAGR
Public	-0.01	-3.63	0.09	22.59	0.04	6.57	0.03	2.52
Private	0.02***	6.47	0.08	10.92	0.1	17.74	0.06	15.04
Toatl	0.01	2.08	0.08*	17.08	0.06	10.59	0.04**	8.33

Note: 1. Trend growth rates are estimated fitting semi-log model, i.e. $\log Y = a + bt$
 2. *, **, and *** are level of significance at 1%, 0.5% and 5% respectively.

Source : Annual Survey of Industries, Summary Results of Factory Sector, Vol 1
 Various Issues

Table- 4.2

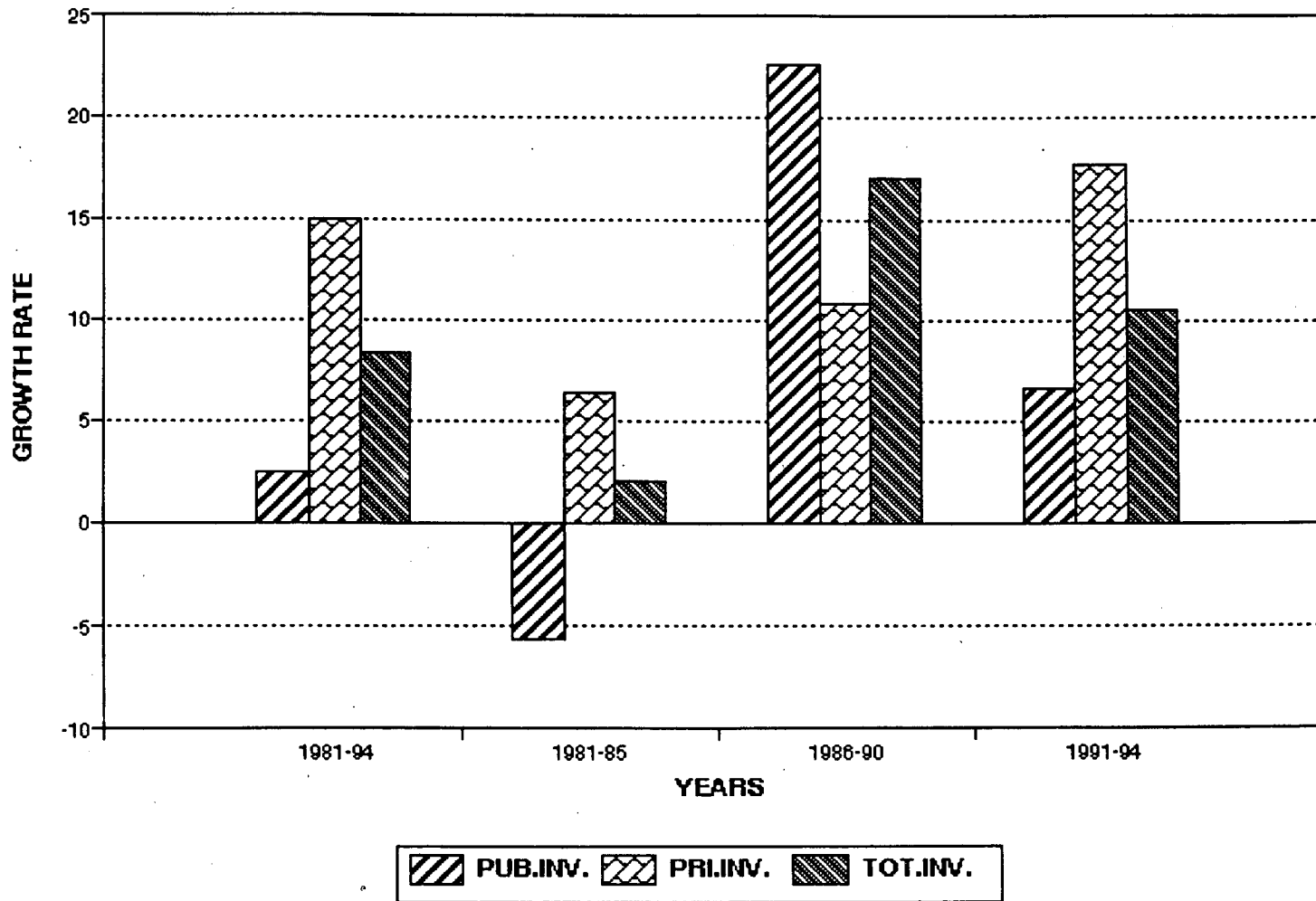
**Distribution of Investment By Ownership
 in Mnaufacturing Sector**

(in Percent)

Years	Public	Joint	Private	Total
1981-82	56	12	32	100
1982-83	53	8	39	100
1983-84	46	13	41	100
1984-85	61	9	30	100
1985-86	38	22	40	100
1986-87	48	11	41	100
1987-88	52	10	38	100
1988-89	17	36	47	100
1989-90	50	-15	65	100
1990-91	61	8	31	100
1991-92	31	11	58	100
1992-93	51	1	48	100
1993-94	27	2	71	100

Source : Same as in table 4.1

GROWTH RATE OF INVESTEMENTS IN MANUFACTURING SECTOR



in capacity utilization and efficiency. Much of this improvement was reflected in a substantial increase in the real rates of return on investment in the private manufacturing sector. During the sub-period 1981-85, private investment showed a positive trend, in contrast to public investment. The huge cut in public expenditure during this period, as part of the then fiscal policy, explains these trends to some extent. The Compound Annual Growth rate of total investment, during the 14 year time period, was around 8.33 % p.a.. This was less than that of private investment (Which registered 15.04% growth) and more than that of public investment (registering 2.52% growth).

If we examine the sector-wise distribution of investments in manufacturing sector (Table 4.2), we observe a clear increase in the share of private investment and a corresponding decrease in the share of public investment, during the period, 1980 - 94. In 1993-94, private industrial investment accounted for 71% of total industrial investment as compared to 27% of public industrial investment. The above trends is supported by the Investment to GDP ratio in the manufacturing sector (ref. Table 4.3), which shows a steady increase during the said period, in the case of private investment and a steady decline in the case of public investment. In 1993-94, the ratios of Investment to GDP in the case of Private, Public and Total were 21.96, 8.46 and 30.98 respectively. Thus, so far, the trends and related factors highlight the increasing contribution of private investment in the manufacturing sector. At this juncture, it becomes imperative to study the industry wise investment structure, in order to enhance our understanding regarding the implications of such investments for future growth.

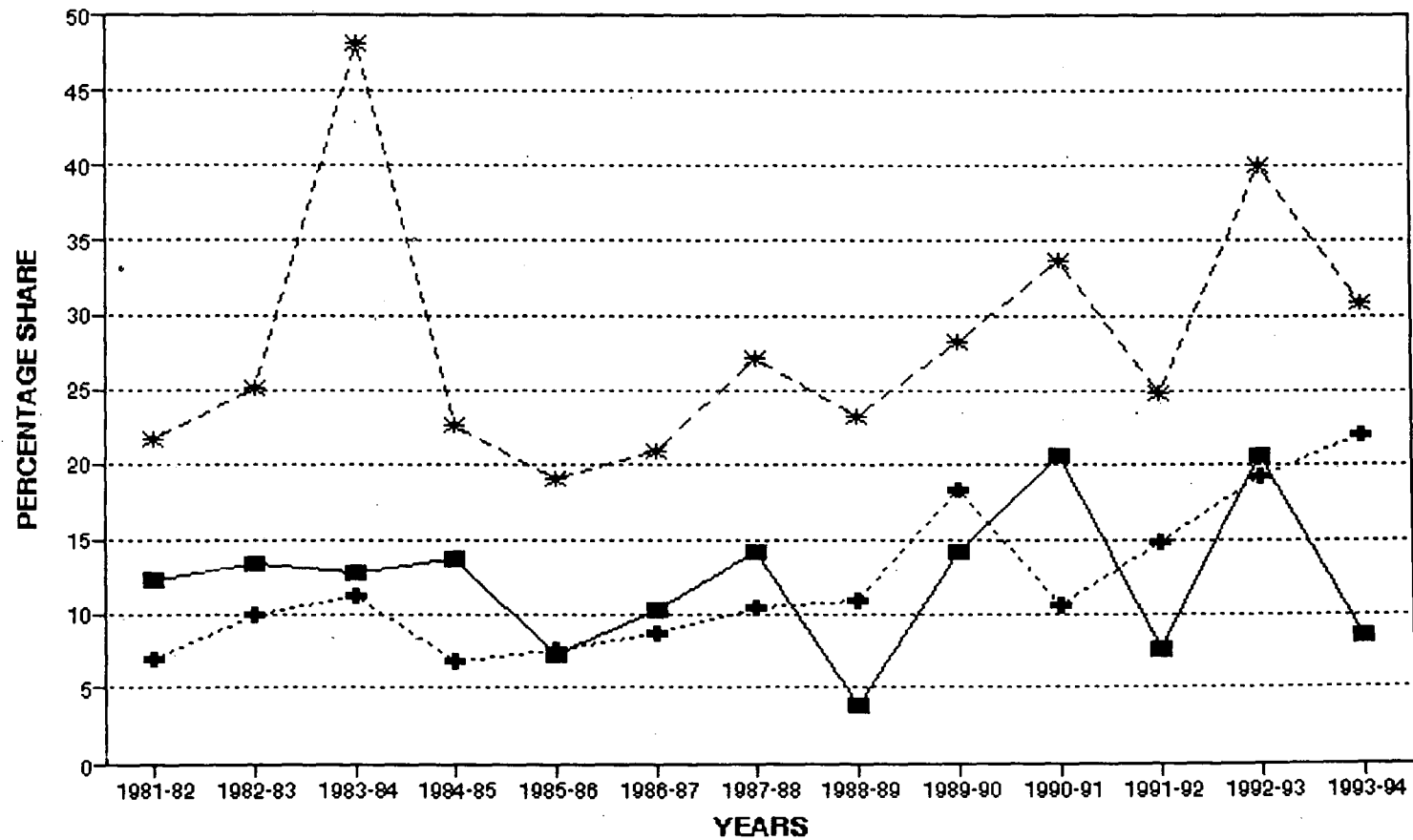
Table 4.3

**Share of Investment to GDP
in Manufacturing Sector (%)**

Year	Public	Private	Total
1981-82	12.13	7.05	21.72
1982-83	13.35	9.85	25.2
1983-84	12.66	11.13	48.16
1984-85	13.71	6.77	23.31
1985-86	7.18	7.62	19.03
1986-87	10.20	8.60	21.05
1987-88	14.20	10.40	27.21
1988-89	3.93	10.88	23.26
1989-90	14.19	18.36	38.27
1990-91	20.61	10.53	33.78
1991-92	7.61	14.65	24.92
1992-93	20.66	19.27	40.13
1993-94	8.46	21.96	30.98

Source : Same as in Table 4.1

INVESTMENTS TO GDP RATIO IN MANUFACTURING SECTOR



PUB/GDPM
 PRI/GDPM
 TOT/GDPM

INVESTMENT STRUCTURE

A study of the survey conducted by the Centre for Monitoring Indian Economy (CMIE), in 1993, of 2, 664 large investment projects, amounting to Rs.6,34,793 Crore and in 1994, of more than 3000 investment projects, amounting to Rs. 7,76,444 Crores, reveals the industry wise distribution of private and public investment in the manufacturing sector* Table 4.4 shows a heavy concentration of private investment for 1993, in the Basic Metals industry (38.33%), followed by Chemicals(26.64%), Textiles(8.06%), Food & Agro product (3.88%), Paper (3.52%), Transportation (3.19%) and Plastic & Rubber products (3.02%). The shares of Non-Electrical Machinery (1.58%) and Electronics & Electrical machinery (2.07%) remained insignificant in that year. The situation remained the same for 1994, except a sharp increase in the share of Textiles industry to 12.09%. Public Investment too showed a similar pattern.

A comparison of the above trend with the ASI data, shows a similar distribution of Total Investment (Table 4.5). While the Basic Metals industry has the largest share and is consistent over the period 1981-93, the Chemicals industry share shows a marked decline from 15.93% in 1981-82 to 7.49% in 1992-93 amidst high fluctuations in between. The Plastic and Rubber products industry, on the other hand has shown a consistent

* It is to be noted here that these Investments were in various stages of approval or implementation.

Table-4.4**Distribution of Investment: Industry by Ownership (%)**

Industry	As on 1993			As on 1994		
	Public	Private	Total	Public	Private	Total
Food & Agro Products	0.22	3.88	2.98	0.67	5.77	4.91
Textiles	0.11	8.06	6.09	0.15	12.09	10.01
Paper	2.22	3.52	3.20	3.58	4.56	4.39
Plastic & Rubber Products	0.11	3.02	2.31	0.03	2.59	2.17
Chemicals	34.89	25.64	27.93	40.87	23.70	26.59
Other Non-Metallic Products	1.82	10.22	8.14	3.90	10.89	9.73
Basic Metals	51.84	38.33	41.66	43.90	31.87	33.90
Non-Electrical Machinery	1.29	1.58	1.51	1.16	0.95	0.99
Electronics & Electrical Machinery	2.73	2.07	2.24	3.57	2.70	2.85
Transportation	2.13	3.19	2.93	0.89	4.35	3.77
Miscellaneous Products	2.62	0.45	0.99	1.24	0.50	0.61

Source : Centre for Monitoring Indian Economy, August 1993-1994.

TABLE 4.5

SHARE OF INVESTMENT BY INDUSTRY GROUP (%)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-98	1990-91	1991-92	1992-93
20-21	5.87	6.63	8.02	5.85	5.98	8.58	6.76	6.46	12.69	5.74	7.45	6.60
22	0.70	0.22	1.60	0.34	2.50	1.27	1.58	1.88	0.42	0.96	1.05	1.47
23	5.25	9.27	6.70	6.57	6.71	5.17	2.98	5.09	4.57	3.68	4.20	5.34
24	5.14	6.60	5.22	3.04	2.99	4.47	6.39	1.04	7.58	4.10	5.66	5.08
25	0.35	0.64	0.27	1.08	0.12	0.07	0.65	1.61	0.04	0.44	0.46	0.13
26	0.42	0.59	0.48	0.66	0.65	0.54	1.98	0.33	1.07	0.63	1.11	0.64
27	0.22	0.39	0.93	0.40	0.16	0.37	0.49	0.46	0.30	0.08	0.09	0.23
28	5.80	6.61	5.96	8.54	4.08	10.30	3.66	5.44	0.82	4.17	3.38	2.88
29	0.36	0.58	0.34	0.38	0.62	0.22	0.44	0.66	0.54	0.75	0.47	0.53
30	9.96	8.44	8.64	6.19	10.21	7.37	7.71	13.02	61.50	17.95	14.78	19.86
31	15.93	8.76	19.89	13.18	25.16	21.34	15.07	16.91	27.00	7.57	6.10	7.49
32	6.40	7.39	8.13	5.46	14.80	12.82	8.67	9.28	6.63	3.66	9.48	4.86
33	25.99	22.74	17.15	26.90	11.61	13.74	20.96	16.47	15.08	37.04	27.57	25.87
34	0.99	1.59	1.93	0.98	1.31	1.15	2.65	2.70	0.55	2.31	1.23	1.94
35+36	9.24	11.97	9.90	9.59	14.77	3.92	12.33	12.01	9.75	7.83	9.55	10.67
37	6.72	7.13	4.09	10.68	5.90	7.73	6.65	5.74	4.49	2.66	6.42	5.43
38	0.64	0.43	0.74	0.95	0.61	1.09	1.03	0.90	1.24	0.43	0.97	1.24

SOURCE: Same as in table 4.1

increase in its share from 9.96% in 1981-82 to 19.86% in 1992-93. Its share reached as high as 61.50% in 1989-90, while during the same year chemical industry showed a share of 27.28%.

If we observe Table 4.6, we find that investment growth rates for the period 1981-94 were highest for Textile products (24.96%) . Next in order were Furniture industry (20.78%), Metal products (19.19%) and Plastic & Rubber industry (15.49%). It is important to note here that the percentage shares of the above industry-sectors for the said period remained relatively insignificant except Plastic & Rubber industry while the industry-sectors having major share of total investment showed comparatively lower growth rates of investment.(see Table-4.5). A disaggregated study of the investment growth rates, reveals large fluctuations in some industry groups. For the sub-periods, 1981-85, 1986-90 and 1991-94, Furniture Industry registered -1.10% , -10.46% and 126.63% growth in investments. Basic Metals Industry recorded -10.17%, 47.52 % and -5.19% for the first, second and third sub-periods respectively. In contrast to the above, Textile industry showed a consistent increase in the three sub-periods with 15.14%, 24.85% and 44.40% investment growth in 1981-85, 1986-90, 1991-94 respectively. This type of trend was shared by Metal Products industry and Food products industry (see Table 4.7) as well.

Table 4.7 shows that , the Value-Added also grew along the same lines for the period 1981-94. They were high for Textiles, Leather and Plastic & Rubber products industry.

TABLE 4.6

INDUSTRY-WISE INVESTMENT GROWTH RATES IN
MANUFACTURING SECTOR (%)

	1981-94	1981-85	1986-90	1991-94
20-21	11.66	5.93	11.64	13.33
22	11.03	35.91	14.44	4.68
23	11.04	10.82	12.99	29.05
24	11.71	-5.31	18.89	19.07
25	5.82	-15.28	73.10	-10.55
26	24.96	15.14	24.85	44.40
27	20.78	-1.10	-10.46	126.63
28	7.03	-1.64	0.99	22.29
29	14.03	17.78	55.24	22.87
30	15.49	6.08	44.58	24.49
31	6.68	15.64	-1.67	38.66
32	11.34	24.81	-5.87	6.28
33	5.68	-10.17	47.52	-5.19
34	19.19	11.53	39.13	51.43
35+36	5.42	15.91	38.95	-5.43
37	6.39	2.81	-2.31	1.06
38	16.77	4.28	0.30	30.15
TOTAL	9.50	5.54	20.98	12.73

SOURCE: Same as in table 4.1

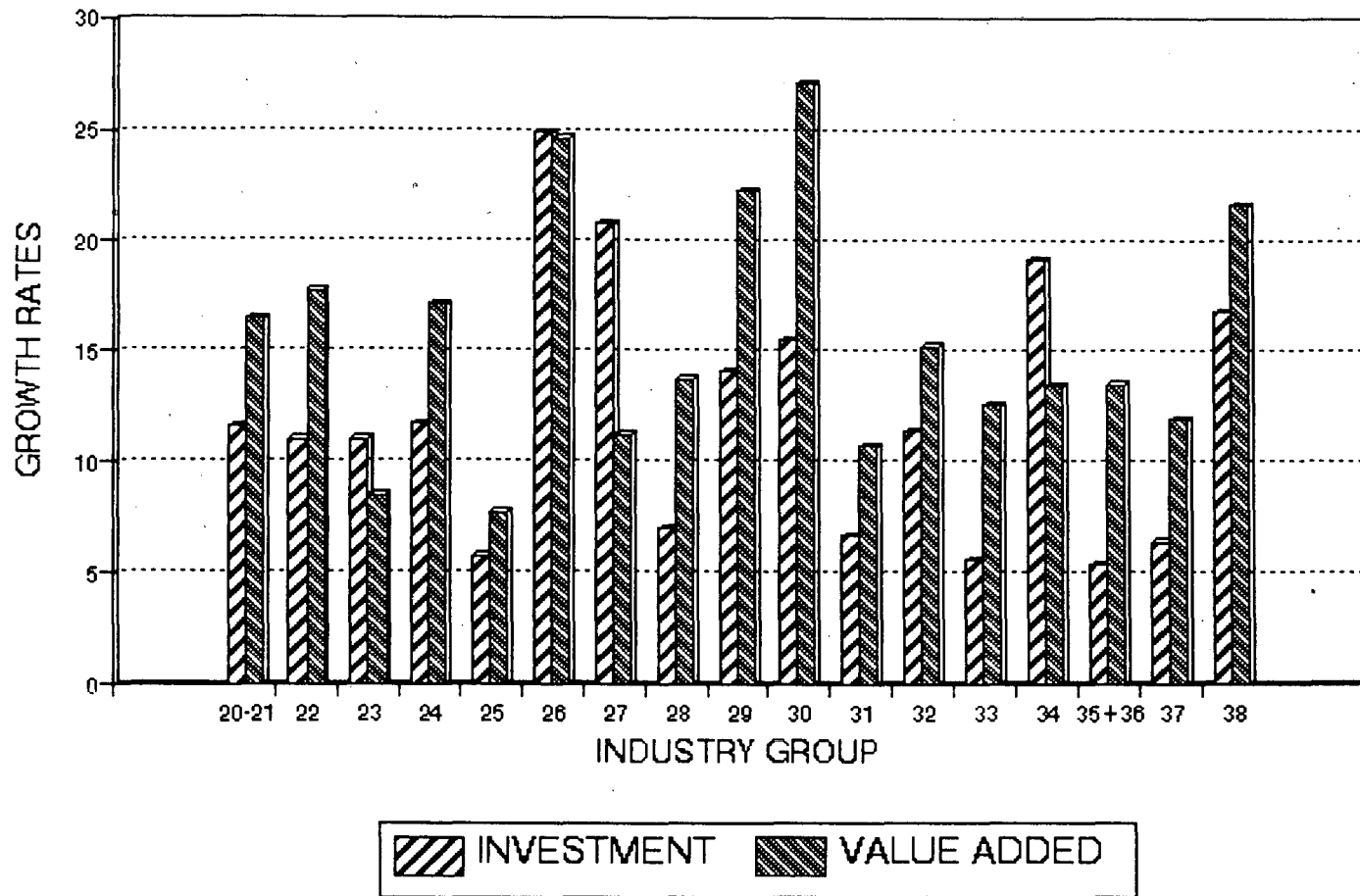
TABLE 4.7

**INDUSTRY-WISE VALUE ADDED GROWTH RATES IN
MANUFACTURING SECTOR (%)**

	1981-94	1981-85	1986-90	1991-94
20-21	16.52	13.66	14.67	15.21
22	17.72	12.35	16.94	9.03
23	8.49	3.78	12.53	8.80
24	17.14	10.62	17.31	31.59
25	7.74	2.20	8.31	3.71
26	24.69	8.90	27.56	31.01
27	11.24	6.18	12.55	14.75
28	13.72	3.43	15.04	15.41
29	22.31	12.35	26.26	22.22
30	27.12	25.27	26.12	24.49
31	10.74	10.82	3.68	25.57
32	15.23	18.25	17.41	-2.35
33	12.55	6.05	20.64	25.98
34	13.41	7.59	15.37	12.00
35+36	13.51	11.44	15.53	6.93
37	11.93	6.66	13.76	8.95
38	21.67	25.30	7.97	33.57
TOTAL	14.90	10.48	15.66	16.44

SOURCE: Same as in table 4.1

GROWTH RATES OF INVEST. & VALUE ADDED OF MAJOR INDUSTRY GROUP (1981-94)



Plastic and Rubber products industry recorded the highest rate of 27.12% followed by Textiles (24.69%), Leather products (22.31%), Food products (16.52%). However, a comparison of these variables shows that growth in value-added was less than that of investment in Cotton Textiles, Furniture and Basic Metal industries. Among the other industry sectors, Food and Agro products, Paper products and Chemicals Industry have performed better both in value growth and with investment growth rates of 11.66%, 7.03% and 6.68% respectively.

A quick glance at the industrial sector indicates that in spite of the low level of per capita income, India has a well diversified and modern manufacturing sector. Table 4.8, shows that the major contribution to value added during 1993-94 comes from the Plastic & Rubber industry (18.59%). It is followed by Electronics & Electrical machinery (13.80%), Basic Metals (11.13%), Food Products (9.31%) and Chemical industry (8.91%). If we observe the trends over the period 1981-94, the Plastic & Rubber industry was the most consistent, in terms of a steady increase in the contribution to value added. The study shows that there has been a marked shift in the contribution, with Basic Metals being taken over by the Plastic & Rubber industry. This diversification has provided the scope of channeling new and increased investment in the manufacturing sector.

As we have so far observed, Private Investment has played an influencing role in maintaining the tempo of structural change. In the light of the above observations, a study of the factors influencing Private Investment

TABLE 4.8

SHARE OF VALUE ADDED BY INDUSTRY GROUP (%)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
20-21	7.76	8.50	10.16	9.23	8.95	9.33	9.14	9.69	10.91	8.93	9.61	8.41	9.31
22	2.09	1.87	3.28	2.58	2.27	2.81	2.87	3.02	2.86	2.97	3.49	3.17	2.87
23	10.07	8.34	9.21	7.62	7.36	7.85	6.49	6.01	7.02	6.85	5.85	5.08	4.77
24	4.08	3.84	3.86	3.95	4.11	4.09	3.71	3.05	4.22	4.39	3.64	3.46	5.25
25	1.80	1.60	1.29	2.02	1.22	1.52	1.44	1.28	1.13	1.09	1.11	0.92	0.78
26	1.21	1.18	1.08	1.51	1.13	1.25	1.22	1.63	1.86	2.04	2.47	2.27	3.52
27	0.60	0.56	0.66	0.59	0.49	0.51	0.51	0.48	0.38	0.44	0.41	0.37	0.40
28	4.44	3.53	3.40	4.13	3.19	3.79	3.63	3.20	3.65	3.69	3.99	3.65	3.89
29	0.61	0.61	0.69	0.79	0.67	0.65	0.79	0.74	0.85	1.01	1.19	1.05	1.38
30	5.00	6.81	3.80	5.79	9.36	9.11	9.40	9.02	14.36	14.04	15.21	18.65	18.59
31	14.39	14.63	15.71	14.40	14.61	14.54	15.68	15.02	8.13	8.42	7.11	9.20	8.91
32	4.01	5.28	5.13	5.58	5.63	4.82	4.68	4.35	4.46	5.19	7.05	4.56	4.16
33	14.57	12.90	12.56	10.44	11.87	10.48	10.82	13.92	11.91	12.94	8.79	11.16	11.13
34	3.02	2.73	2.77	2.75	2.65	2.51	3.01	3.33	2.70	2.48	2.87	2.34	2.55
35+36	16.16	17.08	16.59	18.61	16.87	16.23	17.32	16.19	16.75	16.14	17.82	17.09	13.80
37	9.15	9.36	8.55	8.61	7.67	9.05	7.91	7.89	7.51	8.33	7.95	7.25	6.51
38	1.04	1.18	1.25	1.40	1.95	1.46	1.38	1.17	1.28	1.04	1.45	1.39	2.19

SOURCE: Same as in table 4.1

in the manufacturing sector becomes imperative and is undertaken in the next section.

DETERMINANTS OF PRIVATE INVESTMENTS IN INDUSTRY

Empirical results

We shall here outline the demand and supply factors influencing investments in the private sector according to the specification given in the model. In the given modified flexible accelerator framework, private investment in industry (PI_t) is regressed over change in Gross Domestic Product in manufacturing private sector ($\Delta GDMP_t$), denoting demand factor affecting investments, Profits (P_t) in the manufacturing sector,* Absolute change in disbursements by Financial Institutions (ΔDFI), Public investments in manufacturing sector (GI_t) and lagged investments in Private manufacturing sector (PI_{t-1})

$$\text{i.e., } PI_t = \alpha + \alpha_0 \Delta GDMP_t + \alpha_1 P_t + \alpha_2 \Delta DFI_t + \alpha_3 GI_t + \alpha_4 PI_{t-1}$$

Here, $\alpha_4 = (1-\lambda)$: λ = Coefficient of adjustment

We shall expect, $\alpha_0 > 0$, $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 \geq 0$ and $\alpha_4 > 0$.

1) $\alpha_0 > 0$ implies that the higher the demand for manufacturing products, the higher the investments in private sector. That is to say, private

* Lagged Profit variable (P_{t-1}) given in the model of Chapter:3 has been excluded.

investments and change in Gross Domestic Product in private manufacturing sector are positively correlated.

2). $\alpha_1 > 0$ shows that the greater the profits of the sector, the greater the impetus for private investments. This means that profits and investment are also positively correlated.

3). $\alpha_2 > 0$, shows that, the more the bank credit to the private sector, the greater the private industrial investments. Thus, we expect the sign of α_3 to be positive.

4). $\alpha_3 \geq 0$ captures the crowding in and the crowding out effect of public investment on private investment. If $\alpha_2 > 0$, it indicates that public investments are inducing private investments. On the other hand, if $\alpha_2 < 0$, there is crowding out of private investments by public investments in the manufacturing sector.

5). α_4 , i.e., $(1-\lambda) > 0$, i.e., $\lambda < 1$, explains the positive influence of lagged investment on private investment.

All the variables are at constant prices (except that of disbursements, where absolute change is taken). Investments are deflated by price index of machinery and equipment. Whose data are taken from H.L.Chandhok (1978) and also from reports of RBI bulletin. They are based on 1980-81 prices. Profits, also deflated by the same deflator, and GDP are taken at 1981-82 prices. The period covered is from 1981-82 to 1993-94. Date of Disbursements from All Financial Institutions to private sector has been taken from Industrial Development Bank of India, report on development banking various issues.

The empirical findings are displayed in Table 4.9. From this table, we can examine seven equations, taking two or more independent variables at random, the dependent variable being private investment in industry for the year t. This random selection of variables is done to overcome the problem of degrees of freedom. Since it is a time series study, we check for serial correlation by Durbin-Watson statistic. In our case, one should observe Durbin- H statistic, as the model is an auto-regressive one with a lagged dependent variable as one of the independent variables.

$$D.h. = (1 - \frac{1}{2} d) [n/1-n(\text{var}(\delta_2))]^{1/2}$$

Here,

D = Durbin-Watson statistic.

n= Sample size on number of observations.

$\text{var}(\delta_2)$ = Variance of the coefficient of the lagged dependent variable. $-1.96 \leq h \leq 1.96$

From table 4.9, it may be observed equation (1) explains the significant part played by profits in influencing private investments in industry. One percent change in private investment is brought about by a 1.70 percentage change in profits. It is also significant at 0.5 percent level. The role played by demand factor, (captured by change in Gross Domestic Product) in manufacturing private sector, has expected sign and the value of the coefficient is 0.21. It is also significant at 0.5 percent level.

The problem is this equation is that of negative sign for legged dependent variable. This may be due to the problem of multi-collinearity. The

correlation between independent variables, profit and lagged private investment is high at around 0.92% and profit and disbursements from All Financial Institutions is at 0.95% (refer Table A5). Also the variable public investment exhibits a negative sign. When we include disbursement from All Financial Institutions and exclude public investment from equation (1), equation (2) also depicts the existence of multi-collinearity. Since Durbin h statistic is within the limits signifying no auto correlation we can proceed with the usual testing of hypothesis. In other words we can rely on observed values of testing for the above two equations.

In equation (3), (4) and (5) profit variable has been excluded and the remaining independent variables, like change in $GDMP_t$ and public investment has been included in equation (3), $GDMP_t$ and disbursements by All Financial Institutions in equation(4) and $GDMP_t$, disbursements by All Financial Institutions and public investment in equation (5). Equation (3), (4) and (5) bring out a clear explanation with expected sign for lagged dependent variable and which is also significant. But the more acceptable equation could be equation (5) because its explanatory power is more compare to the other two equations. Thus, equation (5) is the true explanation of the factors influencing industrial investments in private sector. From equation (5) we get the value of the adjustment coefficient (λ), [i.e., $1-\lambda=0.60$, $\Rightarrow \lambda=0.40$]

That is the tune of 40 percent of the discrepancy in planned investment get adjustment within a single period.

Among the other determinants disbursement by All Financial Institutions play a key role, as may be seen from the equation (5). A .62% change in

disbursements to private sector brings about 1 % change in investment. The demand factor influencing investments in private sector, captured by $GDMP_t$, has come out to be negligible and is also insignificant. This variable is study in detail in the next section of investment and growth.

The important conclusion we draw from the results is that of public investment crowding out private investment in manufacturing sector. It is significant at 15 percent level. (equation 5).

Profits in manufacturing sector would also become an important variable influencing industrial investment, as shown by equation (6), with an expected sign and the value of the coefficient being 0.84, which is also significant. Equation (6) don't have a problem of serial correlation too.

So far, we have discussed the empirical findings with respect to factors determining Private Industrial Investment at All India Level. Our analysis remains incomplete, unless we examine the relationship between investment and growth.

INVESTMENT AND GROWTH

The accelerator theory of investment states that investment depends on change in output or income. In this context we shall examine the role played by gross output, i.e., GDP at factor cost, in influencing industrial investment. Data on investment, defined as change in fixed capital plus depreciation have been taken from ASI, and has been deflated by price index of machinery and equipment. Grow Domestic Protect (GDP) at factor cost of manufacturing sector has been obtained from data of Central

Statistical Organisation at 1980-81 prices. GDP of manufacturing in public sector has been deducted from GDP in manufacturing sector to get the data of GDP in manufacturing private sector.

Whether growth of the economy is contributing to growth of the investment in industry is an important question which can be answered from our analysis. From table 4.10, in equation (1), we may notice that one percent change in industrial investment is brought about by 0.34 percent change in GDP in manufacturing sector and is also significant at 25% level. The coefficient of adjustment (λ), calculated from the coefficient of lagged investment is $1-\lambda=0.54 \Rightarrow \lambda=0.46$. That is 46 percent of discrepancy in planned investment get adjusted in a single period. On the other hand from equation (2) we may witness that one percent change in private industrial investment is brought about by 0.03 percent change in gross domestic product in private manufacturing sector. It is also insignificant. The value of λ , adjustment coefficient, i.e., $1-\lambda=0.80$.

Implying $\lambda=0.20$. That is 20 percent of discrepancy is only adjusted in planned investment in a year. So addition of some more variables affecting private investment may reduce the constraints and increase the value of λ , as we have studied earlier.

In the next chapter, trends and determinants of investments in manufacturing sector at regional level is undertaken.

Table 4. 9

ESTIMATES OF THE EQUATION FOR GROSS PRIVATE FIXED INVESTMENT
(MANUFACTURING SECTOR)

	Constant	GDMPt	Pt	DFI	GI	lpt-1	R2	DW	Dh
1	-48.45027 (3.491)	.21003* (3.491)	1.70411* (9.677)	---	.11972**** (1.594)	-0.8611* (-4.979)	0.98	2.1	-0.21
2	-36.50856 (4.609)	.25874* (4.609)	1.51207* (10.381)	.18976*** (2.518)	---	-0.7556* (-5.093)	0.98	1.27	1.78
3	9.69705 (.310)	0.06801 (.310)	---	---	-0.10026 (-3.52)	.86206* (3.392)	0.66	2.6	---
4	7.6868 (.577)	0.11918 (.577)	---	0.31285 (1.116)	---	.58178* (2.067)	0.7	2.75	---
5	16.7205 (1.375)	0.32199 (1.375)	---	.62318*** (1.878)	-.45010*** (-1.508)	.60828** (2.344)	0.78	3.05	---
6	-18.5904 (1.964)	.23464*** (1.964)	.84417* (6.274)	26463**** (1.390)	-0.1858 (1.187)	---	0.93	3.12	---

Note :1 Figures in the parentheses are t- values of the coefficients.

2 *, **, ***, and **** denotes significance at .5%, 5%, 10% and 15% respectively.

Table 4.10

ESTIMATES OF THE EQUATION FOR GROSS PRIVATE FIXED INVESTMENT
(MANUFACTURING SECTOR)

	Dependant Variable	Constant	ΔGDPT	It-1	R2	DW	Dh
1	It	40.87312	.34052** (1.21)	.53843*** (1.9136)	0.33	2.06	-0.78
2	lpt	7.64642	0.3973 (.202)	0.80543* (4.101)	0.66	2.57	-2.33

NOTE 1 Figures in the paranthesis are t values of the coefficients.

2 *, **, and *** denote significance at 5%, 10%, and 25% respectively.

CHAPTER V

INDUSTRIAL INVESTMENT: A REGIONAL ANALYSIS

Regional disparities in Industrial development in India are reflected in the undulated spread of Industrial Investments over space. In order to get further insights into the regional pattern of industrial investment, we study the growth rates of investment and value added at State level. The study confines itself to 15 major states, which contribute to around 96% of the total investments. Before we go into the study of the industrial investment scenario at regional level, it is worthwhile to have a quick look at the theoretical dimensions of the problem of regional development.

Since the imperatives of development called for optimal utilisation of resources of the economy, it was natural that the investment projects would be on the criterion of maximizing growth.

In the initial stages of development, in order to fully utilise the external economies of scale and other general benefits, industries would be located in a particular centre, the location being determined by the historical circumstances or natural endowments. The logic is that, since industrial development starts, it will develop in a course of its own, sweeping entire economy, transforming production relations and raising the productive capacity and thereby inducing higher rates of investment for further growth.

Gunnar Myrdal (1957)¹ observes that there is an inherent tendency in the free play of market forces not only to create but increase the inequalities between the regions through the “backwash effect”. For once growth takes place in any region due to social, political, economic or historical reasons, the process of growth gets accentuated in that place due to snowballing effect of migration, inter-regional trade and transfer of capital. This in turn leads to deprivation and pauperization of the regions of their locally generated capital, workers skilled and share of tertiary activities, and welfare services (Hirschman, 1958).² But as growth proceeds, according to Hirschman, the regional inequalities tend to decline due to presence of complimentary between regions.

Jeffrey Williamsons (1965)³ has shown that in the initial stages of development , the inequalities between the regions would tend to increase. This, coupled with the fact that if inter-regional linkages are low in the early stages of development, it will tend to expand the inequalities and act as a damper to income-multiplier growth. Over time, as the development process sustains itself with the help of this growth impetus, inequalities across regions tend to converge . As factor and product markets spread over these regions due to technological change, capital markets also have a tendency to develop. Thus, if one thinks of the index of regional inequality as a statistic and considers its

¹ G. Myrdal, *Economic Theory and Under developed Regions*, (Reprint), Bombay, Vara & Co. Publishers, 1958.

² A. O. Hirschman, *The Strategy of economic Development*, New Haven, Yale University Press, 1958.

³ J.G. Williamson, “regional Inequality and The Process of National development : A Description of Patterns” , EDCC, vol. 13, 1965, pp. 3-5.

distribution over time income space one could get a curve of the shape of an inverted U, implying that in the initial stages of development inequalities tend to increase and finally converging at higher income levels. The existence of such disparity has been proved in the case of Italy, Brazil, Spain, U.S. and in a host of other countries (Kuznets, 1965).⁴

In case of LDCs this problem may be more acute because of the fact that given the legacy of a colonial rule, which linked the ports and the mineral rich region and the plantation industry, the initial impetus to growth may result in a perverse development of the erstwhile growth centers. Thus in India, historical forces guided the development of port towns of Bombay, Calcutta and Madras which again acted as an impetus for the growth of Maharashtra, West Bengal and Tamil Nadu. In 1938-39, the presidencies of Bombay, Calcutta and Madras shared about 68% of the total companies at work (Sharma and Chauchan, 1969).⁵ Besides these three presidencies, the thirties also experienced the rise of several centers of industrial development especially, Ahmedabad, Delhi, Kanpur, Madurai and Coimbatore, which were primarily engaged in the cotton textile manufacturing. The spread of industrial production was sided by the creation of local markets through tariff protection particularly during the inter-war period between the two World Wars (Bagchi 1972).⁶

⁴ S. Kuznet, "Quantitative Aspects of Economic Growth of Nations : Part-8, Distribution of Income by Size" EDCC, vol. XI January.

⁵ T.R.Sharma and S. D. Chauhan : Indian Industries , S.L. Agrawal & Co. 1969.

⁶ A.K.Bagchi : Private Investment in India – 1900-1939, Orient Longman, Madras, 1972.

The increasing inequalities in the early stages of economic growth are not likely to decline on their own, there is an anonymous need for government invention. In India, this intervention is observed in granting licenses to private sector and changes in the spatial pattern brought about by the state ownership and control of industries. The former policy whose objective was “balanced economic development of different regions in the country so as to reduce disparities in levels of development”,⁷ has failed to achieve it because the licensing authorities have to keep in mind availability of raw materials and also facilities like power, transport and water while granting licences. The later policy which is reflected in public sector investment in manufacturing by centre was somewhat successful in reducing regional disparities, till 1970, and failed there after. (refer V.K. Seth, 1980).⁸

Ashok Mathur (1983)⁹ vindicates the hypothesis of Williamson in his analysis of regional disparities and economic development 14 major states of Indian during 1950-75. He concludes that in the industry based manufacturing sector the 1950s marked a period of rising regional After studying the roots of the colonial legacy, its impact on industrial development and the role played by government in reducing regional The shares of the states in cumulative annual investment in central public

⁷ Ninth Report of the Estimates Committee, Room No. 4 Lok Sabha, Lok Sabha Secretariat, 1967, pp.11-12.

⁸ V.K. Seth : Industrialisation In India : Spatial Perspectives, Commonwealth Publishers, New Delhi, 1987.

⁹ Ashok Mathur, Regional Disparities and Economic Development in India, EDCC, 1983, pp. 475-503.

undertakings are reported in Table. 5.1. The data source is annual reports of the Bureau of Public Enterprises.

Table 5.1 shows that the combined cumulative percentage share of Bihar (19.72), Madhya Pradesh (14.6) and Orissa (5.78) was 40.17 in 1980. Therefore their relative share has declined consistently, and their combined share has declined by 15 percent over the period 1980-94. Among these backward states, the share of Bihar has fallen tremendously from 19.72% 1980-81 to 8.78%, in 1993-94.

On the other hand, the combined share of industrially developed states of Maharashtra, Gujarat, West Bengal and Tamil Nadu increased by 13%. Among the industrialised states, the share of Maharashtra continued to increase throughout the period, and it registered the highest percentage increase in its share from 10.17 in 1980-81 to 22.54 percent in 1993-94.

In case of less developed states, the relative share of Uttar Pradesh, Andhra Pradesh and Assam have increased continuously. In Andhra also a developing state exhibited a decline in percentage share from 4.70% in 1980-81 to 2.44% in 1993-94.

Pradesh it increased from 5.50 % to 9.19 %, in Assam from 3.74 % to 4.04 % and in Uttar Pradesh from 5.66% to 9.19%. Karnataka which is Public sector investment during this period was more biased towards the chemical and engineering Industries. Industries were established on commercial lines competing with the private sector, and significantly influenced by market considerations. Moreover the importance of regional pulls and pressures increased during this period. Public investment in infrastructure development also favoured the industrial

TABLE 5.1

PUBLIC INVESTMENT IN MAJOR STATES (%)

	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
AP	5.50	5.58	7.57	8.81	9.54	10.20	10.96	10.97	11.24	11.29	12.03	10.59	9.98	9.19
ASSAM	3.74	5.91	5.58	5.51	5.76	5.80	6.18	5.65	5.37	5.00	5.06	4.27	3.99	4.04
BIHAR	19.72	18.66	16.62	14.71	13.72	12.16	11.29	10.09	9.58	9.54	9.92	9.29	9.01	8.78
GUJARAT	5.95	5.12	4.15	4.31	4.16	4.63	5.18	5.57	5.75	5.60	0.57	6.74	6.78	7.53
HARYANA	1.45	1.33	1.11	1.03	0.97	1.05	1.05	1.01	0.92	0.89	0.99	0.57	0.61	0.55
HIP	0.82	0.77	0.60	0.50	0.50	0.63	0.85	0.94	1.08	1.28	1.28	1.42	1.34	1.50
KARNATAK	4.70	4.46	3.77	3.42	3.12	2.98	2.79	2.56	2.47	2.56	2.50	2.11	2.31	2.44
KERALA	2.68	2.50	2.19	2.04	1.95	1.78	1.74	1.73	1.73	1.68	1.72	1.45	1.46	1.47
MAHARASTR	10.17	11.44	14.95	16.89	17.88	17.40	17.65	18.47	18.36	19.72	20.42	20.27	21.25	22.54
MP	14.67	14.68	13.68	12.88	12.69	13.19	13.90	13.58	13.05	12.45	11.97	10.39	10.36	9.26
ORRISA	5.78	5.88	5.39	6.18	7.05	7.85	7.51	6.77	6.49	5.90	6.40	6.20	6.47	6.89
PUNJAB	2.33	2.07	1.72	1.53	1.32	1.16	1.04	0.99	0.91	0.83	0.83	0.68	0.79	0.69
RAJASTHAN	2.01	2.17	1.97	1.83	1.52	1.38	1.26	1.49	1.59	1.70	2.06	1.94	1.86	2.05
TN	5.14	4.98	5.52	6.07	5.99	5.69	4.90	5.37	5.56	5.84	6.62	5.70	5.53	5.47
UP	5.66	5.33	6.53	5.98	5.95	6.38	6.35	8.11	9.41	8.70	9.49	10.50	9.60	9.19
WB	9.67	9.13	8.66	8.31	7.87	7.71	7.35	6.71	6.50	7.01	8.15	7.87	8.65	8.42

SOURCE: BUREAU OF PUBLIC ENTERPRISES: ANNUAL REPORT OF THE WORKING
OF INDUSTRIAL AND COMMERCIAL UNDERTAKINGS OF CENTRAL GOVT. GOVERNMENT OF INDIA

developed states. Therefore, all these factors, market orientation biases infrastructural facilities accompanied by regional pulls and pressures resulted in further spatial spread of public-sector investment, favouring developed more than the industrially under developed states. The extent of regional disparities widened with private sector investment also preferring industrially developed states. Table 5.2 portrays the distribution of investment in public and private sector conducted by Centre for Monitoring Indian Economy (CMIE) in 1994 of 3,201 investment projects and in 1997 of 3,521 investment projects. We observe that the share of private sector is more than 50 percent in the states of Andhra Pradesh, Guajrat and West Bengal, Karnataka, Madhya Pradesh, Maharashtra, Orissa and West Bengal in 1994 and 1995. Two more states Tamil Nadu and Uttar Pradesh have also experienced this period in 1997. In the remaining states, of Andhra Pradesh, Bihar, Haryana Himachal Pradesh and Kerala the public sector had an upper hand.

Table 5.3 picturises the percentage share of major states in total investment both in public and private sector. We witness that more than 55 percent of private investment is shared by the states of industrially developed and developing ones. These are Andhra Pradesh (10.78), Gujarat (13.48), Maharashtra (14.60), Karnataka (7.88), Tamil Nadu (4.51) and Uttar Pradesh (6.20) in 1994. This situation remained same in 1997. On the other hand the backward states, Madhya Pradesh and Orissa which shared more than 25 percent of private investment in 1944, could not maintain the same in 1997. It falls to 14 percent by 1997.

Table 5.2

DISTRIBUTION OF INVESTMENT: STATE BY OWNERSHIP

STATES	DECEMBER 1994		AUGUST 1997	
	PUBLIC SECTOR	PRIVATE SECTOR	PUBLIC SECTOR	PRIVATE SECTOR
AND PR	25.86	73.75	46.08	50.17
BI	75.11	24.12	79.88	19.04
GUJ	34.56	57.16	31.29	57.07
HAR	66.78	30.33	83.52	15.01
HIP	64.94	32.36	70.93	33.07
KAR	21.62	66.09	23.62	56.24
KER	68.26	30.14	54.08	43.30
MP	39.85	56.85	38.31	46.42
MAH	37.62	57.88	47.53	46.17
ORR	34.89	63.88	21.71	52.45
PUN	31.37	23.05	32.44	10.08
RAJ	59.92	39.57	42.30	57.64
TN	44.18	40.75	45.44	49.92
UP	45.09	42.83	39.67	46.19
WB	36.22	51.25	39.14	42.91

Source : Centre for Monitoring Indian Economy, Dec. 1994 and Aug. 1997

Table 5.3

DISTRIBUTION OF INVESTMENT: STATE BY OWNERSHIP

STATES	DECEMBER 1994			AUGUST 1997		
	PUBLIC SECTOR	PRIVATE SECTOR	TOTAL	PUBLIC SECTOR	PRIVATE SECTOR	TOTAL
AND PR	4.64	10.78	7.46	8.11	7.95	7.49
BI	4.61	1.20	2.55	5.55	1.19	2.96
GUJ	10.01	13.48	12.03	7.82	12.85	10.65
HAR	3.56	1.32	2.22	2.96	0.48	1.51
HIP	4.85	1.97	3.10	3.31	1.39	1.99
KAR	3.16	7.88	6.08	5.46	11.72	9.85
KER	3.18	1.14	1.93	4.60	3.32	3.62
MP	10.50	12.20	10.95	5.02	5.48	5.58
MAH	11.41	14.30	12.60	11.91	10.42	10.67
ORR	8.86	13.22	10.55	4.82	10.49	9.46
PUN	1.80	1.08	2.38	1.75	0.49	2.30
RAJ	3.48	1.87	2.41	2.71	3.33	2.73
TN	6.00	4.51	5.64	10.83	10.71	10.15
UP	8.01	6.20	7.38	5.71	5.99	6.13
WB	3.34	3.85	3.83	5.32	5.26	5.79

Source : Same as in Table 5.2

Thus, we see the large percentage share of private investment is concentrated in infrastructurally well equipped states. These are states which are industrially developed too. Since the share of private sector in total investment is rising, after 1991, (as observed in the pervious Chapter). There are the states which also occupied large share in total investment. (Table 3). We shall now discuss the regional investment scenario from the data provided by Annual Survey of Industries, as we don't have the data relating to the private investment at regional level.

GROWTH RATES

Table -5.4, studies the investment growths in the 15 major states over the time period 1981-94 and also for the sub-periods 1981-85, 1986-90 and 1991-94. Himachal Pradesh tops list with 22-24% for the entire period (1981-94). This is followed by Gujarat (19.43%), Haryana (15.88%), Rajasthan (14.71%), Punjab (12.52%) and Maharastra(12.42%). Kerala has the least growth of 0.21% for the said period. An analysis of sub-periods, shows fluctuating trends in the case of Andhra Pradesh, West Bengal and Uttar Pradesh. Among them, West Bengal recorded 2.49 % growth during 1981-85, 190.72 % during 1986-90 and -13.56 during 1991-94. Orissa showed a negative growth during all the sub periods, registering -3.76%, -23.79% and -27.49% in the first, second and third sub-periods respectively. These wide ranging fluctuations reflect the inconsistency of government policies on Public investments.

An analysis of the state-wise distribution of investment (Table 5.5) shows that Maharashtra accounts for the largest share (22.25%), followed by Gujarat(20.53%), Tamil Nadu(10.53 %), Bihar (7.72%), Uttar Pradesh

TABLE 5.4**GROWTH RATES OF INVESTMENT IN MANUFACTURING
SECTOR OF MAJOR STATES (%)**

	1981-94	1981-85	1986-90	1991-94
AP	7.25	16.88	55.86	-35.96
BIHAR	10.24	5.25	7.06	9.13
GUJARAT	19.43	27.87	16.47	130.41
HARYANA	15.88	25.60	14.63	24.75
HIP	22.29	34.39	52.52	26.13
KARNAT	9.08	12.92	10.07	-0.20
KERALA	0.21	13.71	17.19	-21.16
MP	-2.27	-27.66	12.26	28.85
MAHARAS	12.42	1.20	11.69	33.90
ORRISA	11.51	-3.76	-23.79	-27.49
PUNJAB	12.52	7.27	29.35	7.54
RAJASTHA	14.71	22.48	15.70	.3.07
TN	7.51	8.44	26.57	16.18
UP	2.13	-25.37	11.64	-14.38
WB	3.95	2.49	190.72	-13.56
TOTAL	9.46	5.03	21.32	8.37

SOURCE: Calculated from Annual Survey of Industries,
Summary results of factory sector

6.75%) and Rajasthan (5.03%). A contrasting feature emerges in the case of Himachal Pradesh .While Himachal Pradesh enjoys a high growth rate of 26.13%; its share in total investment is very low, amounting to around 0.66% during 1991-94. It might be due to small base of the state.

On the other hand, Uttar Pradesh had a negative growth in investment during 1991-94 . (-14.38%). But its share in total of investments of the 15 major states ; was at a respectable level of around 7.9% . These trends question the government policy towards industrial investments in according to much importance to industrially developed states.

A look at the value-added growth rates of the 15 major states, for the period 1981-94 (Table - 5.6) shows that Himachal Pradesh tops the group with 22.36%, followed by Uttar Pradesh (17.50%), Punjab (17.21%), Orissa (16.45%), Karnataka (16.36 %) and Gujarat (16.13%). A sub period analysis reveals declining trend in the case of Himachal Pradesh. And Uttar Pradesh, whereas West Bengal , Maharashtra, Madhya Pradesh & Gujarat show a consistent increase in the growth of value-added. Table-5.7 shows the share of states in value-added. During 1991-94, Maharashtra had the highest share, amounting to around 24% . Tamil Nadu came next having around 11.5% share, disparities in the process of industrial development after independence till 70s, we shall look into the regional pattern of industrial investment. First we shall examine the part played by public investment doing the

TABLE 5.5

DISTRIBUTION OF INVESTMENT IN MAJOR STATES:MANUFACTURING SECTOR

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-98	1990-91	1991-92	1992-93	1993-94
AP	4.87	5.70	8.74	5.06	8.32	8.53	4.29	7.23	4.90	29.85	18.10	2.95	3.74
BIHAR	7.04	12.95	5.31	4.84	7.12	6.89	3.81	4.72	8.23	3.69	7.56	2.33	7.72
GUJARAT	6.62	14.58	15.37	5.81	17.69	18.29	8.72	6.41	10.21	14.92	2.14	17.61	20.53
HARYANA	2.11	3.82	2.02	2.85	5.15	2.35	2.30	3.90	3.17	1.77	2.90	2.14	4.42
HIP	0.22	0.14	0.98	0.27	0.75	0.14	0.89	-0.08	0.02	0.44	0.59	0.65	0.93
KARANATAK	3.22	7.11	4.51	3.70	4.63	5.15	6.95	6.68	3.60	3.17	3.94	3.36	3.08
KERALA	2.73	3.71	2.35	1.39	4.05	1.62	2.37	2.09	1.68	1.36	2.25	1.29	0.86
MP	9.96	10.30	8.44	13.65	1.54	8.24	8.50	8.34	3.86	5.59	1.36	17.61	2.28
MAHARASTR	15.73	10.61	23.23	22.99	13.06	20.79	16.15	21.06	29.57	13.75	11.79	23.30	22.25
ORRISA	2.42	3.16	2.67	4.09	1.56	6.52	13.97	5.99	1.54	0.64	10.27	1.99	3.08
PUNJAB	2.66	3.17	2.91	3.22	2.96	1.60	6.40	1.98	4.33	2.20	3.90	2.45	3.81
RAJASTHAN	2.74	3.64	3.66	4.90	5.91	3.65	3.21	3.58	2.55	2.88	5.85	2.65	5.03
TN	13.31	6.85	10.50	10.00	15.61	7.05	8.06	12.83	7.24	8.72	8.55	10.61	10.53
UP	16.62	8.26	4.71	9.30	3.01	9.09	9.44	10.52	14.32	5.99	13.69	3.15	6.75
WB	9.76	6.00	4.59	7.93	8.63	0.08	4.93	4.74	4.77	6.31	9.83	7.91	4.99

Source : Same as in table 5.4

period of our study (1980 to 1994). Disparities but thereafter this sector showed a consistently declining trend of disparities followed by Gujarat (10.5%). Though Himachal Pradesh has a comparatively respectable growth rate of value-added at around 10 %, during the sub period 1991-94, its share in value-added for the States, was very insignificant at around 0.45%.

A comparison of growth rates of investment and value added assumes significance at this juncture. During the period 1981-94, value- Added for the States of Gujarat and Haryana had growth at a lower rate than investment (Tables-5.4 & 5.6). On the other hand, for Uttar Pradesh and West Bengal, having low investment growth rate there has been a remarkable growth in value added. This shows a neglect of high growth areas while formulating the investment plan by the Central and State Governments. This negligence is also reflected in the distribution of public sector investment among states. The high percentage share of investment is garnered by Maharashtra at the cost of the backward states of Orissa, Madhya Pradesh and Bihar during the period 1981-1994 (Table 5.1). The industrially less developed states like Andhra Pradesh, Karnataka etc., are also not accruing as much public investment as they should have disparities in the process of industrial development after independence till 70s, we shall look into the regional pattern of industrial investment. First we shall examine the part played by public investment during the period of our study (1980 to 1994). Disparities but thereafter this sector showed a consistently declining trend of disparities.

TABLE 5.6**GROWTH RATES OF VALUE ADDED IN MANUFACTURING
SECTOR OF MAJOR STATES (%)**

	1981-94	1981-85	1986-90	1991-94
AP	15.75	12.36	16.30	16.29
BI	11.09	6.02	14.75	6.04
GUJ	16.13	11.64	10.46	22.54
HAR	14.72	9.92	17.36	12.06
HIP	22.36	23.77	27.08	10.02
KAR	16.36	14.81	17.35	7.17
KER	11.78	7.50	13.66	0.91
MP	14.32	4.80	25.17	21.23
MAH	14.86	11.34	14.12	26.33
ORR	16.45	10.33	22.38	6.21
PUN	17.21	11.61	23.13	15.90
RAJ	15.56	11.94	18.92	8.01
TN	15.91	10.37	16.98	16.71
UP	17.50	11.59	17.52	10.00
WB	10.03	6.14	10.48	13.78
TOTAL	14.78	10.10	15.66	16.51

SOURCE: Same as in table 5.4

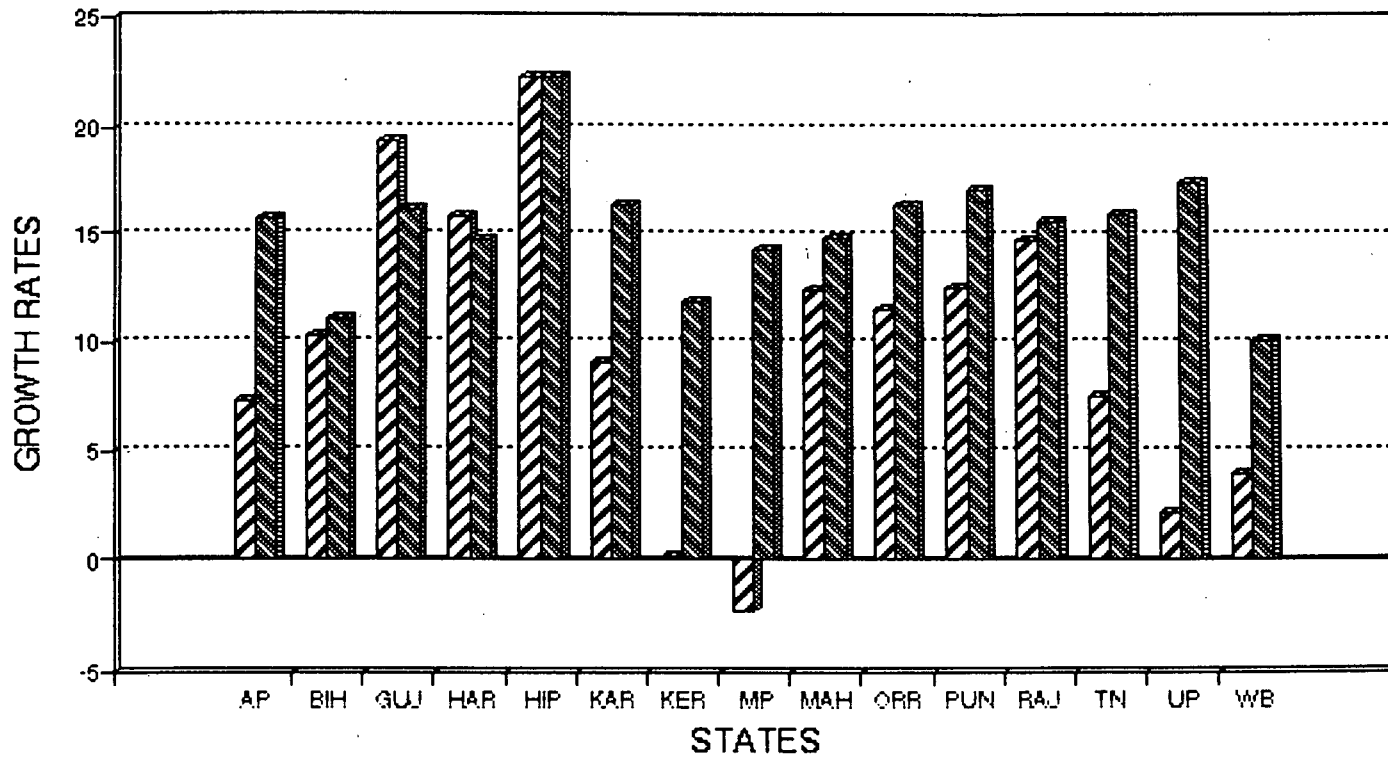
TABLE 5.7

DISTRIBUTION OF VALUE ADDED IN MAJOR STATES: MANUFACTURING SECTOR (%)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
AP	4.90	5.73	6.27	6.58	5.43	5.48	5.26	4.81	5.49	5.63	5.50	5.84	5.46
BIHAR	7.58	6.10	5.73	6.24	6.28	6.18	7.16	8.01	7.18	5.94	6.37	6.93	4.96
GUJARAT	9.80	10.27	11.42	9.84	10.50	11.43	10.68	10.87	9.10	9.08	9.80	12.36	11.41
HARYANA	3.30	3.16	2.73	3.09	3.28	3.37	3.35	3.01	3.36	3.63	3.69	2.82	3.28
HIP	0.16	0.15	0.16	0.14	0.29	0.22	0.27	0.38	0.22	0.35	0.44	0.37	0.37
KARNATAK	4.35	4.97	12.33	5.24	5.36	5.24	5.30	7.97	5.83	5.63	6.67	5.58	5.19
KERALA	3.01	3.03	2.68	3.18	2.67	2.75	3.22	2.73	3.73	2.52	3.28	2.60	2.13
MP	6.10	6.21	5.30	5.35	4.77	4.20	5.30	5.75	5.28	6.23	5.14	5.12	5.79
MAHARASHTR	26.16	23.86	23.57	24.83	27.67	26.12	23.16	23.99	23.74	24.43	20.70	24.33	26.39
ORRISA	1.42	1.31	1.44	1.05	1.43	1.69	1.81	2.77	2.63	2.24	2.25	1.94	1.71
PUNJAB	3.08	2.81	2.77	2.96	3.30	2.77	3.36	3.11	4.14	3.79	4.11	3.16	4.05
RAJASTHAN	2.20	2.25	3.00	2.54	2.39	2.74	2.58	2.19	2.56	3.15	3.02	2.88	2.40
TN	10.77	11.12	9.57	12.21	10.91	11.40	10.73	11.04	11.63	12.07	12.16	11.46	12.23
UP	6.08	7.94	4.12	6.82	6.51	7.81	8.02	6.94	9.19	8.46	9.80	8.65	8.25
WB	11.08	11.09	8.91	9.92	9.22	8.60	9.80	6.44	5.93	6.84	6.86	5.96	6.39

SOURCE: Same as in table 5.4

GROWTH RATES OF INVESTMENT AND VALUE ADDED OF MAJOR STATES DURING (1981-94)



INVESTMENT
 VALUE ADDED

REGIONAL DISPARITIES IN INDUSTRIAL INVESTMENT

In this section we shall address the question whether regional disparities are widening due to unequal distribution of industrial investments among regions or because of some other factors. As we have seen from the theories of regional development the role of public sector in reducing the regional disparities as developments takes place. This scenario worked well until 1980, where a convergence in regional inequalities has been noticed. But after 1980, with the onset of liberalisation the role played by public sector has diminished. Though it can play a major role atleast in the development of backward regions, it continued to fail in fulfilling this objective as we discussed earlier. Has this failure affected the regional distribution of investment is the biggest question one has to answered before one looks at the problem of disparities in regional development. If there are disparities in regional investments, naturally there will be disparities in development of regions.

So we finally look at the State-wise distribution of per capita investment over the period 1981-82 to 1993-94 (Table-5.8). Here per capita investment is calculated as percentage share of state to the total sum of 15 states considered divided by percentage growth of population of that particular state. A consistent increase in investments is observed in the case of Gujarat, Maharashtra, Tamil Nadu, Punjab and Himachal Pradesh. Most of the remaining States either do not show any considerable increase in per-capita investments or show a declining trend. If we examine the Covariance for the said period, we find a constant

TABLE 5.8

	1981-82	1982-83	DISTRIBUTION OF PERCAPITA INVESTMENT IN MAJOR STATES: MANUFACTURING SECTOR (%)										
AP	1.44	1.69	2.60	1.51	2.49	2.56	1.29	2.19	1.48	8.80	5.33	0.87	1.10
BIHAR	1.60	2.93	1.20	1.10	1.61	1.56	0.86	1.07	1.86	0.84	1.71	0.53	1.73
GUJ	3.08	6.78	7.15	2.70	8.24	8.53	4.08	3.01	4.81	7.06	1.01	8.35	9.73
HARYANA	0.26	0.47	0.23	0.35	0.62	0.28	0.28	0.47	0.38	0.21	0.34	0.25	0.52
HIP	0.81	0.53	3.65	1.00	2.82	0.53	3.37	-0.31	0.09	1.66	2.22	2.46	3.50
KARNATAK	0.14	0.30	0.19	0.16	0.20	0.22	0.30	0.29	0.16	0.14	0.17	0.15	0.13
KERALA	1.70	2.33	1.49	0.89	2.62	1.05	1.54	1.37	1.11	0.91	1.51	0.87	0.59
MP	3.32	3.43	2.81	4.55	0.51	2.75	2.83	2.78	1.29	1.86	0.45	5.87	0.76
MAHARASHTR	3.93	2.65	5.81	5.75	3.27	5.20	4.04	5.26	7.39	3.44	2.95	5.83	5.56
ORISSA	1.46	1.91	1.62	2.49	0.95	4.00	8.59	3.69	0.95	0.39	6.36	1.23	1.90
PUNJAB	2.52	3.02	2.78	3.08	2.84	1.54	6.18	1.92	4.17	2.13	3.77	2.37	3.67
RAJASTHAN	1.26	1.67	1.67	2.22	2.67	1.64	1.43	1.60	1.14	1.28	2.60	1.17	2.22
TN	4.37	2.27	3.48	3.33	5.23	2.38	2.73	4.43	2.51	3.05	3.01	3.77	3.77
UP	2.37	1.18	0.67	1.32	0.43	1.29	1.33	1.48	2.02	0.84	1.93	0.44	0.95
WB	0.28	0.17	0.13	0.23	0.25	0.00	0.14	0.14	0.14	0.18	0.28	0.23	0.14
MEAN	1.90	2.09	2.37	2.05	2.32	2.24	2.60	1.96	1.97	2.13	2.18	2.29	2.42
STD	1.29	1.61	1.97	1.58	2.10	2.18	2.30	1.57	1.97	2.52	1.85	2.45	2.49
COV	67.55	77.08	83.24	77.06	90.57	97.55	88.32	79.97	100.37	117.90	84.76	106.98	102.77
H-H	0.06	0.08	0.11	0.08	4.00	0.11	0.14	0.07	0.09	0.13	0.09	0.13	0.14

SOURCE: Same as in Table 5.4.

TABLE 5.9

Compound growth rates of covariance and
Hirschman-Herfindahl index (%)

	1981-94	1981-85	1986-90	1991-94
CAGR	3.28	6.04	3.86	6.63
HH	6.54	13.10	2.23	13.65

SOURCE: Same as in Table 5.4.

increase from 67.55% in 1981-82 to 102.77 in 1993-94. Similarly, the Hirschman-Herfindahl Index increased from 0.06 in 1981-82 to 0.14 in 1993-94. These trends suggest increasing spatial disparities in per capita investment. This is strengthened by the fact that the compound annual growth rate (CAGR) for the coefficient of variance (COV) as well as for the Hirschman-Herfindahl (HH) are on a rising trend recording 3.28 and 6.54 respectively for the period 1981-1994 (Table 5.9). The above trends require to be further analysed in the light of the factors influencing such trends.

The major factor could be that the failure of the public investment in developed regions to refinance the development in backward regions. In the words of Hirschman, "...with regard to the central government's pattern of regional investment it should be clear that after development has proceeded for some time, the need for public investment relative to private may tend to diminish, and in any case a large portion of public investment may be financed from earnings of previous investments." This, of course, provides an excellent opportunity to alter the geographic composition of public investment in favour of the less developed areas (Hirschman, 1958, p.1954).

The result, low percentage share of public investment endowed to backward regions like adding a pinch of salt to the already sore finger, in the private foreign investment especially after 1991, (between August 1991 to March 1998) more Industrial Entrepreneur Memorandas (IEMs) as much as 51.14 percent have gone in favour of industrial developed

states like Maharashtra, Gujarat, Tamil Nadu and Uttar Pradesh (Economic Times, 13 July, 1998).

Thus, we can conclude that neither public investment nor private investment is helping the cause to reduce regional inequalities, and that regional disparities in industrial investment is witnessed and has become the major cause for regional disparities in industrial development. In the next section we shall examine the major determinants effecting the industrial investment across regions.

DETERMINANTS OF SPATIAL PATTERNS OF INDUSTRIAL INVESTMENT:

At the regional level, a cross-sectional study is made across 15 states to identify the factors influencing industrial investments taking profits defined as difference between net value added and wages (data obtained from ASI) and disbursements from Scheduled Commercial Banks (data obtained from NIC).

Table 5.10

Estimation of Equation for Industrial Investments in India: A Cross-Section Analysis

S.No.	Dependant Variable (I_t)	Constant	P_t	FI	I_{t-1}	R^2	D.W.
1	I 1984-85	78.52563	.07903 (.194)	—	.74889* * (1.826)	.68	1.38
2	I 1988-89	138.968	.47229* * (1.908)	.44381* * (1.84)	.01893 (.106)	.77	1.84
3	I 1992-93	457.26430	.59452* (1.843)	.360301 (1.070)	-.37580* (-2.30)	.77	2.48

Where P_t = profits in period t

FI = disbursements from Schedule Commercial Banks (SCBs)

I_{t-1} = Investment in the period $t-1$.

Note: * and ** denote a significance level of 5% and 10% respectively.

From the above table, we can witness the role played by profits and disbursements by Scheduled Commercial Banks, in influencing industrial investments across regions. From equation (1), we can estimate that lagged industrial investments had a crucial role to play during 1984-85. The value of the coefficient (λ), calculated from the coefficient of lagged dependent variable, is $(1-\lambda=.75 \Rightarrow \lambda=.25)$. That is to the tune of 25% of discrepancy in planned investment has got adjusted in a single year. In 1992-93, the observed lagged investment variable is showing a wrong sign (equation-3).

Equation (2) will give us a true picture of the factors influencing industrial investments. In 1988-89, a .48% change in the profits of that year brought about a 1% change in industrial investment and is significant at 10% level. Similarly a .44% change in Disbursements from Scheduled Commercial Banks to different regions has brought about 1% change in the industrial investments which is also significant. The value of the coefficient of adjustment (λ) computed is .99% which means to the tune of 99% of discrepancy in planned investment has got adjusted during a single year.

Thus we can conclude from the analysis of industrial investments across regions , that there is a significant role played by profits and bank credit in explaining industrial investment pattern across regions.

CHAPTER VI

CONCLUSIONS

In the process of industrialisation, industrial investments play a major role in raising Gross Domestic Product and in generating employment. This study has attempted to sketch the important factors affecting industrial investments during the period 1980-81 to 1993-94, period covering financial crisis and the recovery period in the manufacturing sector in the advent of economic liberalisation. To approach this problem the background of the Indian economy has been studied in the light of the development planning strategy perceived by India in the process of industrialisation. The role of public sector and the import substitution strategy were discussed in detail and came to conclusion that public sector investment in capital goods sector has created inefficiencies in management and low productivity which resulted in the fiscal crisis of the 1980s. A case of private industrial investments has been put forwarded as a remedy to counter the failure of public sector investment in contributing to the growth of the economy.

In the light of the problem faced by developing economies like India, characterised by demand and supply constraints and in the presence of structural and institutional factors like the absence of a well developed financial market, strategic role given to public investment in capital formation, and administered interest rate regime, we made an attempt to study the private industrial investment scenario, its growth trends, and tried to identify the major factors influencing the private industrial investment behaviour.

In the event of not having necessary data to calculate cost of capital in manufacturing sector, we are bound to use the data of profit assuming that the profitability nature of this sector is captured. We also examined the accelerator theory of investment both in private sector and in total (public + private).

Change in Gross Domestic Product in the respective sector has been used to apprise the role played by demand factor in promoting industrial investments in private sector. The most important factor influencing private investment in industry is the public sector itself. An attempt is made to observe the nature of relationship between public and private sector. The role played by bank credit in effecting private investment is also analysed. The lagged private investment variable is also considered in the modified form of flexible accelerator framework built for the purpose of studying the above factors influence on industrial investments.

The other aspects covered in our study include an analyse of the spatial pattern of industrial investments and the determinants affecting the spatial pattern of investments.

The basic data source in our analysis is Annual Survey of Industries (ASI), summary results of factory sector, vol. 1. This volume does not provide with the investment data in manufacturing sector but it supplies the data of fixed capital and depreciation. So we had to define investment as change in fixed capital plus depreciation in current year. Profits are defined as the difference of value added and wages. Since, this data is of book value, we had to deflate investments and profits by price index of machinery and equipment, data furnished from H.L. Chandhok's India data base and Reports of

RBI Bulletin at 1981-82 prices. The other data source include Centre for Monitoring Indian Economy's (CMIE's) Investment Intelligence Service reports, annual reports of IDBI and the National Accounts Statistics of the Central Statistical Organization.

Though, modified flexible accelerator framework worked out in the model cannot be accepted completely in developing economies, the out come of the result of disbursements from all Financial Institutions playing a pivotal role in determining industrial investments by private sector is worthnoting. The other major findings in our analysis include public investment in manufacturing sector crowding out private investments of that sector. Regarding the role played by accelerator theory, the coefficient of the variable Gross Domestic Product in manufacturing private sector has come out very low, though it has a proper sign. When we include the above significant factors affecting industrial investments, in the equation of private investment, the value of coefficient of adjustment (λ) estimated from the lagged private investment variable has improved, implying that constraints faced by private investments has been captured and that discrepancy in planned investment to get adjusted in a single period is covered. Profit variable has also come out significant explaining the role played by profit in investment.

With regard to spatial pattern of industrial investments also the determinants affecting investments scenario like profits and bank credit disbursements from Schedule Commercial Bank) has emerged very important and with these variables, in the estimated equation of investment nearly cent percent of discrepancy in planned investments has got adjusted. On the darker side, one witnesses a rising disparities in regional development as a result of regional inequalities in the growth of industrial investments.

At a more disaggregated level a study of industrial investment at 2 digit level of National Industrial Classification of each industry group in the manufacturing sector provides us with a valuable conclusion. The pace and level of the growth of industrial value added of some industrial groups is not guided by the same pace and level of the growth of industrial investment. In some industry groups growth of the industrial value added is less than the industrial investment. In the same way a similar conclusion is reached when a study of growth of industrial investment at a regional level is made. The pace and level of industrial growth of value added did not correspond to the growth of industrial investment of that region i.e. the growth of industrial investment is more than the growth of industrial value added of a region. This result may be due to greater inefficiencies of management and productivity in some industrial groups and specified regions respectively.

The present study has dealt with only the industrial investments in private sector limiting to manufacturing (factory sector) and the inter-state spread of industrial investments in India. It did not address itself to the problem associated with the identification of suitable regional planning policy for India. To evolve a suitable regional planning policy we need further elaboration on the micro-processes which are peculiar to different regional and different industries. However, the study does help in drawing certain useful lessons. These are :

(a) public investment in manufacturing sector has been crowding out private investment. Thus it appears that public investment has to focus more on the provision of infrastructure in order to encourage private investment in industry and in backward regions.

(b) public investment in recent years is concentrating on commercial lines and forgetting its major objective of 'socialistic pattern of society'. Consequently, a large share of public investment is concentrated in industrially developed states, resulting in the rising regional disparities due to regional inequalities in industrial investments. Thus, there is an urgent need to reduce regional disparities in the spread of industrial investment which calls for public investment in mineral rich backward regions of Madhya Pradesh, Orissa and Bihar.

(c) The availability of bank credit turns out to be the most important determinant of private investment and of spatial spread of industrial investment in India. The disbursements from the development finance institutions have increased manifold since 1980-81 due to lack of a corporate bond market in India. Coupled with this, it is the only source of long term finance which helped in the promotion of private investments. Thus there arises a major need to encourage these institutions by the government in supplying subsidised funds. On the aspect of reducing regional disparities, a diversified spread of these financial institutions and schedule commercial banks is needed.

In the light of these observations, it can be suggested that in the existing circumstances the government should try to concentrate on the improvement of its fiscal and monetary policy, and institutional and technological transformation of the industrial sector for achieving regional spread of modern industry.

Appendices

Appendix - A

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TABLE A

STATE-WISE INVESTMENT IN MANUFACTURING SECTOR (Rs. Crores)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
AP	213.85	261.28	663.18	277.59	466.40	475.64	342.23	654.02	461.70	4375.33	2021.42	423.12	530.91
BIHAR	308.98	593.54	403.17	265.24	399.04	384.54	304.01	426.92	776.23	540.84	844.19	334.73	1097.12
GUJARA	290.27	668.49	1166.64	318.66	992.25	1020.36	694.79	579.97	963.30	2187.09	238.57	2525.22	2918.39
HARYAN	92.49	175.20	153.39	156.12	289.05	131.27	183.72	352.35	299.14	259.77	323.72	306.40	628.44
HIP	9.61	6.51	74.43	14.67	42.13	7.80	71.19	-7.29	2.32	64.37	65.54	93.58	131.50
KARANA	141.37	326.03	342.32	203.18	259.50	287.16	553.77	604.06	339.78	464.03	440.19	481.30	437.55
KERALA	119.57	169.93	178.13	76.31	227.29	90.28	189.02	188.58	158.56	199.55	250.77	184.34	122.87
MP	436.90	472.38	640.79	748.86	86.54	459.83	677.54	754.11	364.32	819.77	151.60	2525.80	324.34
MAHAR	690.11	486.61	1762.56	1261.00	732.44	1159.44	1287.88	1904.28	2788.60	2015.08	1316.97	3341.15	3161.76
ORRISA	106.10	144.75	202.62	224.32	87.61	363.58	1113.56	542.12	145.30	93.45	1147.11	285.11	437.40
PUNJAB	116.83	145.55	221.09	176.62	165.94	89.25	510.03	179.51	408.48	323.13	435.43	352.00	541.60
RAJAST	120.18	166.73	277.87	268.90	331.25	203.82	255.84	323.84	240.69	422.58	653.44	379.33	715.48
TN	583.83	314.28	796.48	548.42	875.34	393.25	642.38	1160.64	682.38	1277.62	954.57	1521.24	1496.92
UP	729.18	378.48	357.35	509.99	168.83	506.73	752.91	951.79	1350.38	878.78	1528.44	451.19	959.35
WB	428.01	275.03	347.98	435.09	484.03	4.46	393.21	429.01	449.84	925.27	1097.05	1134.40	708.61
TOTAL	4387.28	4584.77469	7588.00372	5484.96697	5607.63211	5577.40798	7972.0784	9043.9063	9431.03184	14659.7738	11165.8178	14338.9079	14212.2354

SOURCE Calculated from Annual Survey of Industries, Summary results of factory sector

TABLE A.2

INDUSTRY-WISE INVESTMENTS IN MANUFACTURING SECTOR (Rs. Crores)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93
20-21	266.43	328.02	604.86	332.54	355.35	498.01	549.99	625.27	1176.89	863.58	768.00	1054.94
22	31.99	10.73	120.51	19.34	148.37	73.73	128.71	182.40	38.96	144.75	108.70	234.90
23	238.57	458.55	504.84	373.23	398.79	300.20	242.22	493.05	423.92	552.74	433.12	853.79
24	233.63	326.50	393.85	172.68	177.85	259.36	519.30	100.26	703.43	616.13	583.99	811.32
25	16.12	31.58	20.69	61.37	7.04	4.22	52.83	156.27	3.59	65.58	47.02	20.55
26	19.07	29.22	35.91	37.47	38.60	31.27	161.18	32.15	99.24	94.88	114.73	102.49
27	9.78	19.45	70.05	22.79	9.25	21.46	39.84	44.07	28.02	12.36	9.78	36.46
28	263.47	326.86	449.28	485.34	242.61	597.51	297.52	526.63	76.21	627.81	348.46	459.75
29	16.34	28.81	25.50	21.59	37.04	12.52	35.70	63.63	49.76	112.83	48.56	84.21
30	452.11	417.61	631.30	351.45	607.21	427.40	627.37	1260.32	5704.86	2699.89	1523.44	3173.57
31	723.57	433.04	1499.73	748.51	1496.03	1238.45	1225.29	1637.11	2530.55	1138.19	629.30	1197.61
32	290.60	365.48	613.29	310.34	880.19	743.90	704.95	898.47	615.42	549.78	977.77	776.94
33	1180.48	1124.94	1293.44	1528.35	690.44	797.19	1704.83	1594.54	1398.79	5570.18	2842.40	4133.78
34	45.09	78.88	145.47	55.85	77.81	66.77	215.71	261.23	50.99	348.10	127.29	310.11
35+36	419.70	592.21	746.56	544.65	878.23	227.28	1002.76	1162.90	904.75	1177.39	984.95	1705.76
37	305.28	352.89	308.35	606.83	350.70	448.81	541.21	555.58	416.91	399.36	662.12	867.64
38	29.24	21.29	56.11	54.19	36.06	63.16	83.51	86.76	115.31	64.11	99.49	198.20
TOTAL	4541.47	4946.07	7539.73	5680.92	5946.36	5802.81	8132.90	9680.65	9276.51	15037.65	10309.10	15980.93

SOURCE: Calculated from Annual Survey of Industries,
Summary results of factory sector

TABLE A.3

STATE-WISE VALUE ADDED IN MANUFACTURING SECTOR

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-98	1990-91	1991-92	1992-93	1993-94
AP	57202	77154	104574	112046	102448	109387	119707	141143	185534	232763	243443	329329	382835
BI	88487	82140	95595	106300	118547	123344	163125	234753	242927	245451	291145	390273	347142
GUJ	114381	138194	190383	167565	198323	228101	243306	318499	307684	375028	434161	696355	798974
HAR	38541	42491	45557	52572	61835	67313	76207	88248	113479	149842	163241	159071	229718
HIP	1886	2054	2619	2463	5477	4384	6205	11146	7335	14527	19523	21044	25996
KAR	50769	66951	205656	89236	101263	104530	120615	233761	196987	232659	295540	314446	363825
KER	35130	40818	44758	54202	50438	54826	73368	79978	125966	104008	143395	146680	149391
MP	71162	83625	88444	91118	89966	83768	120700	168651	178440	257391	227580	288513	405520
MAH	305266	321083	393044	422760	522343	521483	527572	703272	802802	1009156	916762	1370930	1848396
ORR	16522	17644	24019	17943	27008	33772	41147	81147	89002	92716	99863	109392	119638
PUN	35983	37763	46140	50366	62314	55330	76609	91127	140049	156574	182015	178150	283408
RAJ	25695	30314	50044	43173	45162	54742	58715	64073	86504	130193	133675	162299	168431
TN	125699	149622	159682	207940	205907	227675	244393	323521	393363	498651	538718	645788	856427
UP	70991	106824	68708	116071	122844	155957	182742	203407	310714	349651	434241	487209	577916
WB	129276	149262	148602	168940	174163	171748	223251	188676	200420	282657	303893	335982	447626
TOTAL	1166990	1345939	1667825	1702695	1888058	1996360	2277662	2931402	3381206	4131267	4429197	5635461	7005243

SOURCE: Calculated from Annual Survey of Industries,
Summary results of factory sector

TABLE A.4

INDUSTRY-WISE VALUE ADDED IN MANUFACTURING SECTOR (Rs.Crores)

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
20-21	93638	118844	165207	164731	177643	195308	217208	285980	397494	387220	446772	484619	683239
22	25231	26193	53402	46038	45166	58894	68129	89258	104121	128772	162209	182631	210256
23	121433	116603	149780	135996	146195	164502	154300	177390	255881	296800	271825	292680	350133
24	49244	53665	62817	70481	81569	85658	88182	89941	153801	190293	169064	199289	385214
25	21742	22419	21044	36029	24238	31766	34143	37874	41276	47356	51389	53030	57320
26	14651	16465	17610	26915	22439	26131	28909	48231	67857	88236	114719	130610	257987
27	7262	7828	10697	10506	9800	10577	12169	14214	13670	19105	19197	21102	29003
28	53587	49304	55375	73654	63417	79409	86354	94359	133130	159964	185504	210198	285186
29	7389	8497	11290	14025	13224	13654	18850	21981	30953	43807	55474	60716	101281
30	60250	95229	61770	103296	185881	190775	223383	266200	523204	608701	706833	1075185	1363634
31	173535	204568	255424	256946	290097	304549	372678	443591	296096	364876	330249	330694	653959
32	48332	73842	83504	99586	111761	100878	111340	128457	162640	225116	327841	263065	305255
33	175682	180378	204274	186205	235610	219550	257097	410989	433972	560957	408465	643420	816704
34	36481	38124	44984	49060	52596	52568	71467	98362	98542	107456	133357	134681	187333
35+36	194872	238794	269822	331968	334859	339975	411692	477883	610287	699660	827948	985395	1012346
37	110312	130914	139049	153558	152262	189592	188098	233069	273734	361244	369284	418152	477628
38	12525	16527	20312	24897	38691	30622	32839	34638	46815	44932	67307	80290	160381
TOTAL	1206166	1398194	1626361	1783891	1985448	2094408	2376838	2952417	3643473	4334495	4647437	5765757	7336859

SOURCE: Calculated from Annual Survey of Industries, Summary results of factory sector

Table A:5

Correlation Matrix of Explanatory Variables
in Private Investment

	Ipt	IPt-1	GDMPT	DFI	Pt
Ipt	1.00				
IPt-1	0.81	1.00			
GDMPT	0.14	0.12	1.00		
DFI	0.92	0.88	-0.05	1.00	
Pt	0.94	0.92	-0.006	0.95	1.00

Source : Derived from ASI Data

Appendix - B

National Industrial Classification Codes and Descriptions

Codes	Description
20-21	Manufacture of Food Products
22	Manufacture of Beverages, Tobacco and Tobacco producers
23	Manufacture of Cotton Textiles
24	Manufacture of Wool, Silk and Synthetic Fibre Textiles
25	Manufacture of Jute, Hemp and Mesta Textiles
26	Manufacture of Textiles Products (including wearing apparel other than footwear)
27	Manufacture of Wool and Wool Products, Furniture and Fixtures
28	Manufacture of paper and Paper Products, Printing and Publishing and Allied Industries
29	Manufacture of Leather, Leather and Fur Products (except repair)
30	Manufacture of Rubber, Plastic, Petroleum and coal Products
31	Manufacture of Chemicals and Chemical Products (Except products of petroleum and coal)
32	Manufacture of Non-metallic Mineral Products
33	Basle metal and Alloys Industries
34	Manufacture of Metal Products and Parts except Machinery and Transport Equipment
35	Manufacture of Machinery, Machine Tools and Parts except Electrical Machinery
36	Manufacture of Electrical Machinery, Apparatus, Appliances and Supplies and Parts
37	Manufacture of Transport Equipment and parts
38	Other Manufacturing Industries
40	Electricity
41	Gas and Steam
42	Water Works and Supply
74	Storage and Ware-housing
741	Cold Storage
97	Repair Services

APPENDIX C

ABBREVIATIONS:

EPW		Economic and Political Weekly
EDCC	-	Economic Development and Cultural Change
IDBI	-	Industrial Development Bank of India
IEG	-	Institute of Economic Growth
IEJ	-	Indian Economic Journal
IER	-	Indian Economic Review
LDCS	-	Less Development Countries
RBI	-	Reserve Bank of India

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