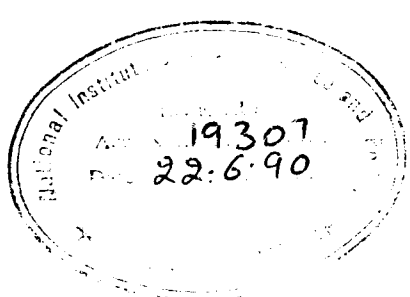
GROWTH OF MANUFACTURING INDUSTRIES IN INDIA 1975-76 TO 1985-86: A DISAGGREGATED STUDY

SAHANA GHOSH

NO.4 JUNE,1990



This paper is a part of the Macroeconomic and Industrial Policy Research programme at the National Institute of Public Finance and Policy, New Delhi and sponsored by the Ford Foundation. I thank the participants of an internal seminar at the NIPFP and especially Dr B.N. Goldar for useful comments and suggestions. The responsibility of the remaining errors is, however solely mine.

ABSTRACT

This paper studies the pattern of growth of the Indian manufacturing sector during the period 1975-76 to 1985-86. Forty nine major three-digit industry groups are chosen for the investigation and their growth rates over the ten years since 1975-76 are analysed. Growth of these industries in the first half of the eighties as compared to the second half of the seventies is also discussed. Performance of the manufacturing industries according to the use-based and the input-based classification are also looked into.

GROWTH OF MANUFACTURING INDUSTRIES IN INDIA 1975-76 TO 1985-86 : A DISAGGREGATED STUDY

Introduction

The well-documented phenomenon of industrial deceleration in India since the mid-sixties started showing signs of reveral from the mid-seventies.[1] The rate of growth of manufacturing value-added rose from 3.6 per cent per annum during the period 1964-65 to 1974-75 to 5.87 per cent per annum during the next eleven years, i.e. 1975-76 to 1985-86. Especially in the 1980s, Indian industry is believed to have moved up to a higher growth path. Nagaraj (1989) has gone as far as to state that the growth of manufacturing industries during the period 1980-81 to 1986-87 is "comparable to, if not better than, the growth rate achieved during 1959-60 to 1965-66" (p. 1484).

The fact that the mid-seventies was a watershed for Indian industries and that the growth rates, both on the aggregate and also for many individual industries, picked up considerably is beyond doubt. However, on a close scrutiny of the data available, it becomes clear that the extent of the revival has been overstressed by some authors.

It is well known that the value-added data as provided by the Annual Servey of Industries (ASI) is more reliable than the Index of Industrial Production (IIP) to analyse the growth performance of Indian industries [2] The IIP is known to give an insufficient representation of the manufacturing industries because of its limited coverage of firms and the dependence on voluntary responses. Also, the change in the base year from 1970-71 to 1980-81 for the IIP construction has been subject to some criticism. In the new IIP, 96 new items have been included and 95 old ones dropped, supposedly to take into account the changing industrial structure. Chandrasekhar (1988) writes, "the higher growth rate that the new index throws up could be because of arbitrary changes in the items covered leading to increased value-added per unit of physical output in the more rapidly growing industries" (p.2359).

Nagaraj, however, claims that the new IIP is still an underestimation although less so than earlier. Hence, the IIP growth rates, according to him, are quite reliable. This view is endorsed by Kelkar and Kumar (1990). To prove his contention, Nagaraj points out that the IIP growth rate for the period 1980-81 to 1986-87 is even less than the value-added growth for the same period. Therefore, it is asserted that the new IIP cannot be an overestimation.

This line of argument however, has one major fallacy. This arises from the fact that the new National Accounts Statistics (NAS) series for registered manufacturing value-added, on which Nagaraj depends for his comparison, is itself an approximation to some extent. For computing the real value-added series in the new NAS (Base: 1980-81=100), the normal practice of using ASI data for value-added and wholesale price indices (WPI) has been followed uptill 1984-85. But for the subsequent years as the ASI was not yet available, IIP has been used to estimate the value-added figures. Therefore, the comparison of IIP with NAS which itself incorporates IIP for two years, is not valid.

It is also reasonable to suspect that the high growth rates in the eighties as depicted by the NAS data, is partly the result of such statistical approximations. For instance, the value-added of output at current prices in 1985-86 as estimated by NAS was Rs. 1,25,976 crore whereas the actual value of output as quoted in the ASI for the same year was Rs. 1,20,155 crore. Obviously, this discrepancy of Rs. 5,821 crore occurs as a result of using the revised IIP to construct the output series and also the NAS method of correcting for non-response.

In order to arrive at a more genuine picture, we have computed value-added growth rates of manufacturing industries using directly the ASI data deflated by suitable price indices. This yields an exponential growth rate of 6.14 per cent per annum for the period 1980-81 to 1985-86. This is less than the rate of 7.6 per cent per annum achieved during 1959-60 to

1965-66 (as computed by Ahluwalia, 1985), which is in contrast to Nagaraj's result. Manufacturing value-added grew at the rate of 5.87 per cent per annum during 1975-76 to 1980-81.

The aggregate growth rates give an overall picture of industrial performance. For a detailed analysis, however, it is essential to go into a sufficient level of disaggregation so that the nature of industrial restructuring and the changing pattern of growth becomes evident. Almost all the studies that have dealt with industrial growth since the mid-seventies (Ahluwalia, 1987; Alagh, 1988; Chandrasekhar, 1988; Nagaraj, 1989; Kelkar and Kumar 1990) or for that matter, even those which investigated into the deceleration period, used the data at the two-digit level of National Industrial Classification (NIC). In view of the diversified nature of the industrial sector and the structural changes that have occured in the recent years it is felt that a study at a more disaggregated level is called for. This is precisely what this paper attempts to do. The growth rates of the major three-digit industry groups of the NIC are looked at. The aim of this paper is to study the nature of growth in the manufacturing sector during 1975-76 to 1985-86

Choice of Time Period and Data Base

The reference period chosen for this study is 1975-76 to 1985-86 in view of the fact that symptoms of revival in the Indian industrial sector was first observed in 1975-76 after the prolonged stagnation since the mid-sixties.[3] Not only did the aggregate manufacturing sector register a higher growth rate since 1975-76, most of the two-digit industry groups also grew faster than in the previous decade (see Appendix Table A.1).

To see if the liberalisation measures initiated since the mid-seventies, and intensified in the late seventies and early eighties, affected Indian industries, the eleven-year period has been broken down into two sub-periods, 1975-76 to 1980-81 and 1980-81 to 1985-86. It is true that the effects would

show up only after a lag and in that light, the post-1985 period would provide a more interesting case. But, ASI data are at present available only upto 1985-86 and so our study has to be limited till then. Besides it is justifiable to assume that the positive effects, if any, of liberalisation started in the seventies should have been reflected in terms of higher growth rates in the eighties.

The main purpose of this paper is to describe the pattern of growth and see whether the pick-up which started in 1975-76 was maintained in the eighties. It is also believed that the structural changes which had in fact started in the deceleration period became more pronounced in the eighties. A look at the first half of this decade therefore would be instructive to investigate into this phenomenon more precisely even if it is agreed that the changes in industrial and trade policies in the eighties would not be captured in this exercise.

From the three-digit NIC, 49 industry groups each with gross value-added of over Rs.100 crore in 1985-86 have been chosen. The data have been drawn from the ASI [4] Since we are here interested mainly in the manufacturing industries, electricity, gas and steam, water works and supply, storage and warehousing and repair services are not included. The 49 industries chosen accounted for 84.80 per cent of value-added in the manufacturing sector in 1985-86.

Gross value-added of each industry is the value of output minus the value of input of all factories registered under the Factories Act, 1948, that is, factories employing 10 or more workers and using power or those employing 20 or more workers but not using power. Value of input, as obtained from ASI, includes excise and transport costs but value of output does not. Admittedly, this may give rise to some bias in the measurement of value-added growth. Moreover, WPI includes excise but output figures do not, which is yet another source of bias in estimates of growth.

The gross value-added of the selected manufacturing industries has been deflated by the respective price indices.[5] As the product classification of the WPI series does not match exactly with the industrial classification of the ASI, deflation of value-added has been done with the best available price indices.

Methodology

To compute the growth rates of real value-added during the entire period 1975-76 to 1985-86, exponential trend lines are fitted by Ordinary Least Square (OLS) technique. We estimate the following regression equation:

$$\ln \quad Y_{it} = a_i + b_{it} + u_{it}$$

where Y_{it} is the real value-added of the i^{th} industry at time t and u_{it} is the error term. Estimated b_i gives the growth rate of the i^{th} industry.

For the growth rates in the sub-periods, the single kink model is used, following Poirier (1976) as the conventional method of estimating the semi-log equation with slope and intercept dummies is subject to errors due to fluctuations.[6] For the Indian manufacturing sector, Goldar and Seth (1989) found that the dummy method might lead to higher (or lower) growth rates for both sub-periods than the entire period. In the kink model, the growth rates of the entire period lie in between those of the sub-periods. This is so because in this method, the entire series is taken instead of fitting piece-wise regression equations and the effects of fluctuations are thereby minimised.

To obtain estimates of growth rates for the periods 1975-76 to 1980-81 and 1980-81 to 1985-86, we estimate the equation:

$$\text{Ln } Y_{it} = a_{i1}D_1+a_{i2}D_2+(b_{i1}D_1+b_{i2}D_2)t+u_{it} \qquad (1)$$

where D_1 = 1 for 1975-76 to 1980-81,
= 0 otherwise
D_2 = 0 for 1975-76 to 1980-81,
= 1 otherwise

The trend line is kinked at 1980-81 (i e., the 6th year) if $b_1 \neq b_2$. Thus, we impose the linear restriction that the trend lines depicting the two sub-periods intersect at 1980-81 Therefore we have

$$a_{i1} + b_{i1} = a_{i2} + b_{i2} \qquad (2)$$

Substituting for a_{i2} in equation (1), we get:

$$\text{Ln } Y_{it}=a_{i1}+b_{i1}(D_1t+6D_2)+b_{i2}(D_2t-6D_2)+u_{it} \qquad (3)$$

The OLS estimates of b_{i1} and b_{i2} for equation (3) give the exponential growth rates for the two sub-periods of the i^{th} industry.

The sub-period growth rates for the 49 manufacturing industries are also calculated by the dummy method. Although the two sets of growth rates are similar in most industries, the anomaly that Goldar and Seth had commented upon is evident in some cases. In industries where the value-added fluctuated widely, the sub-period growth rates by the dummy method do not average out to the growth of the entire period. Such fluctuating industries are oil and vanaspati, petroleum and coal products, n.e.c. fertilisers and pesticides,

turpentine and synthetic fibres etc., fabricated metal products and heavy industrial machinery. The kink method is, therefore, more reliable for our purpose.

Pattern of Growth

The growth rates of the 49 manufacturing industries during 1975-76 to 1985-86 and those in the sub-periods (calculated by the kink method and the dummy method) are shown in Table 1. Analysing the growth rates for the entire period, it is found that among the 28 industries which grew faster than average the trend growth rate was more than 10 per cent per annum in a number of industries. These included grain mill products, bidi, spinning and weaving of synthetic textiles cement, radio and television transmitting and receiving sets, electronic computers and control instruments, and two-wheelers. On the other hand, of the 21 industries which had less than average growth rates, many had very low or even negative growth rates. These results clearly bring out the wide divergence among industries in regard to their growth performance.

It is interesting to note that the leading industries were the typical sunrise industries while the sunset industries lagged behind. The phenomenon of growth being concentrated in the new industries was, however, not sudden. Reorganisation of capital away from the traditional industries started in the stagnation period itself. Mundle (1981) noted that a large number of relatively new industries whose weights were then low grew fast during 1966-73. These were concentrated mostly in the chemical, machine building and electrical goods sectors and included electrical appliances, communication equipment, motor cycles etc. classified as consumer goods.(See Appendix Table A.2 for a disaggregated picture of IIP growth rates during 1966-73). The transformation of the industrial structure took a more obvious form since 1975-76 and particularly in the eighties. The weights of the new industries rose by then and their fast growth contributed to the increase in the overall growth rate.

Table 1 :Growth rates of real gross value added of selected manufacturing industries (per cent)

Code	Industries	1975/76-85/86	Kink method 1975/76-80/81	Kink method 1980/81-85/86	Dusav method 1975/76-80/81	Dusav method 1981/82-85/86
201	Dairy products	4.22	6.06	2.69	6.79	4.51
204	Grain mill products	13.69	17.07	10.26	13.94	14.29
206	Refining of sugar	10.06	5.20	14.71	8.35	17.20
210&211	Edible oil & vanaspati	5.24	4.01	2.69	6.19	7.21
212	Tea processing	2.49	-5.38	10.26	-0.37	10.17
226	Bidi	10.87	19.30	2.44	20.67	5.86
227	Cigarettes,etc	-2.35	-15.55	9.91	-14.42	10.24
231	Cotton textiles	1.38	5.87	-7.1	5.12	-0.85
241	Woollen textiles	7.74	0.53	[illegible]	[illegible]	[illegible]
247	Synthetic textiles	12.87	15.45	[illegible]	[illegible]	[illegible]
251	Jute textiles	-2.57	5.[illegible]	-[illegible]	15.71	-14.[illegible]
280	Pulp & paper	1.59	[illegible]	[illegible]	2.88	[illegible]
284&285	Printing & Publishing	5.71	7.46	[illegible]	6.18	[illegible]
300	Tyre & tube industries	8.44	2.60	14.27	4.18	17.59
303	Plastic materials n.e.c.	11.94	8.24	15.60	10.60	20.33
304	Petroleum refineries	8.19	-3.51	19.39	-0.88	25.41
305&306&307	Petroleum & coal products n.e.c	-5.86	4.71	-16.42	9.64	-0.12
310	Basic industrial chemicals & gases	5.70	6.97	4.42	6.79	4.03
311	Fertilisers & pesticides	11.66	13.71	9.60	14.52	12.12
312	Paints, varnishes & lacquers	2.87	8.37	-2.64	11.25	1.95
313	Drugs & medicines	6.76	6.29	7.24	6.08	6.30
314	Perfumes, cosmetics, etc	3.42	5.83	1.01	5.83	2.58
316	Turpentine, synth resin,synth fibres,etc	6.05	4.37	7.74	3.94	17.23
319	Other chemicals	7.03	6.17	7.86	6.95	9.53
320	Structural clay products	4.68	5.11	4.25	6.45	7.07
321	Glass & glass products	5.75	2.44	9.47	5.32	11.77
324	Cement, lime, plaster	11.41	1.34	21.49	1.12	21.03
329	Miscellaneous non-metallic minerals products	6.68	6.36	6.99	6.36	6.98
330	Iron & steel industries	3.52	6.07	0.98	4.67	0.97
331	Casting & forging of iron & steel	1.26	2.83	-0.32	2.60	-0.81
340	Fabricated metal products	8.99	13.51	4.47	7.54	1.55
343	Hand tools & general hardware	-1.07	3.11	-5.24	4.36	-2.20
350	Agricultural machinery & equipment	7.11	9.18	5.04	10.49	5.14
351	Drills,coal cutting & other mach	8.49	8.04	8.97	10.35	12.87
352	Prime movers, boilers ,etc	3.10	-5.57	11.76	-4.88	15.22
353	Machinery for food & textiles	0.65	3.21	-1.90	5.19	2.26
354	Machinery for other industries	-0.45	3.06	-3.95	1.94	-2.02
356	Non-electrical machinery n.e.c	6.70	7.35	6.67	7.40	6.89
357	Machine tools	7.24	4.79	10.48	1.94	13.01
360	Electrical industrial machinery	8.42	4.79	12.05	2.84	7.95
361	Insulated wires & cables	10.08	17.26	2.90	16.90	3.28
362	Dry & wet battery	5.41	6.46	4.36	5.19	1.02
363	Electrical apparatus, appliances &others	10.10	13.19	10.08	11.38	6.07
364	Radio & television	13.11	1.73	24.49	7.67	26.45
366	Computers & other electronic equipment	19.35	18.82	19.89	18.10	18.57
370	Ship building & repairing	-0.85	12.59	-14.28	9.89	-22.05
371&372	Locomotives, railway wagons & parts	6.10	12.53	-0.33	14.22	1.92
374	Motor vehicles & parts	6.80	5.92	7.69	4.56	9.05
375&376	Motor cycles, bicycles, scooters	11.05	10.98	11.11	11.09	11.02

Source :Computed from Annual Survey of Industries, various issues

and Indices of Wholesale Prices in India, Ministry of Industry

Table 1 :Growth rates of real gross value added of selected manufacturing industries (per cent)

Code	Industries	Kink method			Dubey method	
		1975/76-85/86	1975/76-80/81	1980/81-85/86	1975/76-80/81	1981/82-85/86
201	Dairy products	4.33	6.06	2.59	6.89	4.61
204	Grain mill products	13.69	17.47	10.26	13.94	14.29
206	Refining of sugar	10.60	5.70	14.71	3.35	17.13
210&211	Edible oil & vanaspati	3.24	4.01	2.59	6.19	3.21
212	Tea processing	2.49	-5.58	10.36	-0.27	10.27
226	Bidi	10.87	19.30	2.44	20.67	5.86
227	Cigarettes,etc	-2.85	-15.55	9.91	-14.42	12.24	
231	Cotton textiles	1.28	5.87	-7.[illegible]	8.72	-0.85
241	Woollen textiles	7.74	1.59	[illegible]	[illegible]	11.22
247	Synthetic textiles	12.83	15.[illegible]	[illegible]	[illegible]	10.22
251	Jute textiles	-1.57	5.[illegible]	-[illegible]	[illegible]	-[illegible]
280	Pulp & paper	1.09	[illegible]	[illegible]	[illegible]	[illegible]
284&285	Printing & Publishing	5.71	7.46	3.97	5.15	6.27
300	Tyre & tube industries	8.44	2.60	14.27	4.18	17.59
303	Plastic materials n.e.c.	11.94	8.74	15.60	10.60	20.75
304	Petroleum refineries	8.19	-2.51	19.89	-0.88	25.41
305&306&307	Petroleum & coal products n.e.c	-5.86	4.71	-16.42	7.84	-0.12
310	Basic industrial chemicals & gases	5.70	6.57	4.42	6.79	4.03
311	Fertilisers & pesticides	11.66	13.71	9.60	14.52	12.12
312	Paints, varnishes & lacquers	2.87	8.57	-2.64	11.25	1.95
313	Drugs & medicines	6.76	6.29	7.24	6.08	6.80
314	Perfumes, cosmetics, etc	5.42	5.82	5.01	5.83	5.53
316	Turpentine, synth resin,synth fibres,etc	6.05	4.37	7.74	3.34	17.03
319	Other chemicals	7.03	6.17	7.86	6.95	9.53
320	Structural clay products	4.68	5.11	4.25	6.45	7.07
321	Glass & glass products	5.75	2.44	9.47	5.32	11.77
324	Cement, lime, plaster	11.41	1.34	21.49	1.12	21.03
329	Miscellaneous non-metallic minerals products	6.68	6.76	6.59	6.36	6.98
330	Iron & steel industries	3.52	6.07	0.98	4.67	0.97
331	Casting & forging of iron & steel	1.26	2.83	-0.32	2.60	-0.81
340	Fabricated metal products	8.99	13.51	4.47	7.54	1.55
342	Hand tools & general hardware	-1.07	3.11	-5.24	4.36	-2.20
350	Agricultural machinery & equipment	7.11	9.18	5.04	10.49	5.14
351	Drills,coal cutting & other mach	8.49	8.04	8.97	10.35	13.67
352	Prime movers, boilers ,etc	3.10	-5.57	11.76	-4.38	15.22
353	Machinery for food & textiles	0.65	3.21	-1.90	5.19	2.26
354	Machinery for other industries	-0.45	3.06	-3.95	1.94	-3.03
356	Non-electrical machinery n.e.c	6.70	7.35	6.07	7.40	6.89
357	Machine tools	7.24	4.79	10.48	1.34	10.01
360	Electrical industrial machinery	8.42	4.79	12.05	2.84	7.95
361	Insulated wires & cables	10.08	17.26	2.90	16.00	0.28
362	Dry & wet battery	5.41	6.46	4.36	5.19	1.72
363	Electrical apparatus, appliances &others	10.10	13.19	10.08	11.28	6.07
364	Radio & television	13.11	1.73	24.49	7.67	26.46
366	Computers & other electronic equipment	19.35	18.82	19.89	18.10	18.37
370	Ship building & repairing	-0.85	12.59	-14.28	9.89	-22.05
371&372	Locomotives, railway wagons & parts	6.10	12.53	-0.33	14.22	1.92
374	Motor vehicles & parts	6.80	5.92	7.69	4.56	9.05
375&376	Motor cycles, bicycles, scooters	11.05	10.98	11.11	11.09	11.03

Source :Computed from Annual Survey of Industries, various issues

and Indices of Wholesale Prices in India, Ministry of Industry

It would be interesting to see now whether the fast growth in the initial years of these new and dynamic industries could be maintained for long. Comparing growth rates of the two sub-periods in Table 1 it is found that 23 industries accelerated in the eighties, while the remaining 26 industries which accounted for 50.15 per cent of the total value-added of the manufacturing sector, decelerated. It is also seen that while in the first sub-period the growth rates were negative for four industries, they were so for ten industries in the second sub-period. Thus, it is clear that although on the aggregate, the growth rate of manufacturing industries rose from 5.59 per cent per annum in the first sub-period to 6.14 per cent per annum in the second the performance of many individual industries worsened in the eighties. Singh and Ghosh (1988) also found lower growth rates during the eighties as compared to the second half of the seventies for many two-digit industry groups.

It is worth exploring whether the industries which decelerated in the second sub-period were the ones which grew rapidly in the earlier period. In Chart A the growth rates for the two sub-periods have been plotted on the two axes such that each industry is represented by a point. When a 45 degree line is drawn through the origin, the industries showing deceleration are represented by points above the line and those showing acceleration by points below the line.

A greater number of the fast growing industries during 1975-76 to 1980-81 (i.e., with growth rates above the average of 5.59 per cent per annum) decelerated in the eighties Some industries even moved from the fast growth category to the negative growth category. Examples are cotton textiles, paints and varnishes ship building and locomotives and railway wagons On the whole, 19 fast growing industries of the first period decelerated and only 7 accelerated. Of the 23 industries which grew faster in the second period, 14 were slow growing in the first period. However, the points are concentrated near the 45 degree line which implies that the deceleration (or acceleration) was not of very high magnitude in most industries with, of course some exceptions

Growth Rates During 1975-76 to 1980-81

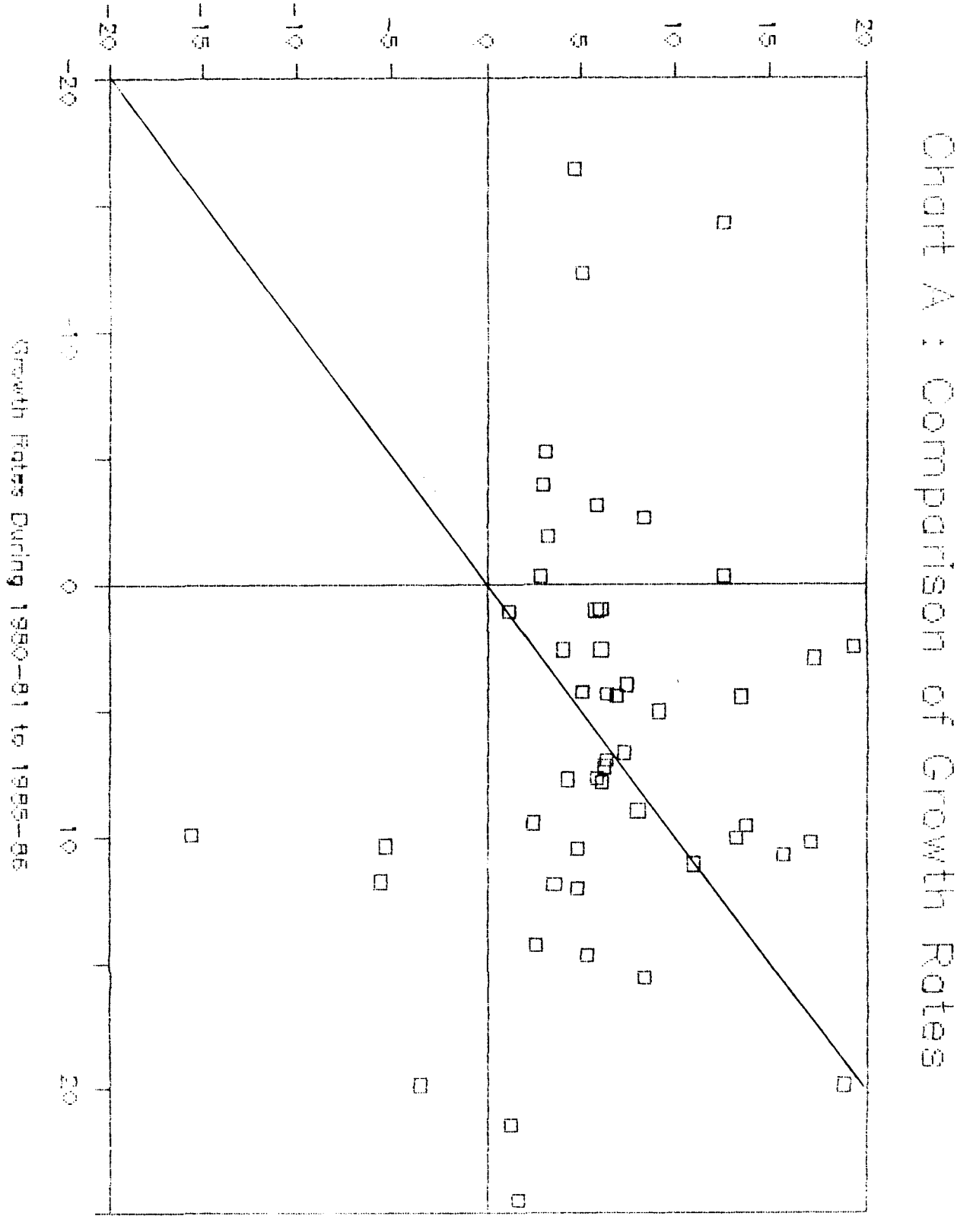


Chart 4 : Comparison of Growth Rates

Quite a few industries which maintained high growth rates over the ten-year period, decelerated in the eighties (see Table 2). These were grain mill products, bidi, spinning and weaving of synthetic textiles, basic industrial chemicals and gases, fertilisers and pesticides, fabricated metal products, agricultural machinery, non-electrical machinery, n.e.c., wires and cables, electrical apparatus and appliances, locomotives and railway wagons. It can be said, therefore, that some industries many of which were the new industries and which started off on a low base, grew rapidly initially but the pace slackened subsequently. An important example is spinning and weaving of synthetic textiles. The industry took shape in the early 1970s and maintained fairly high growth in that decade. But growth slowed down in the 1980s as a result of high capital and raw material costs (see Chandrasekhar 1987 for a detailed survey of the industry). Other new industries like radio and TV, computers and electronic control equipment, motor vehicles and two-wheelers, however, grew faster in the first half of the eighties as compared to the second half of the seventies.

TABLE 2 : INDUSTRIES CLASSIFIED ACCORDING TO GROWTH PERFORMANCE, 1975-76 TO 1985-86

	Acceleration 1	Deceleration 2
High Growth (ROG ⩾ 5.87%)	206, 241, 300, 303, 304, 313, 316, 319, 324, 329, 330, 351 357, 360, 366, 364, 374 375 & 376	204, 226, 247, 311, 340, 350, 356, 361, 363, 371 & 372
Low Growth (ROG < 5.87%)	212, 321, 352	201, 210 & 211 231 280, 284 & 285, 310, 312, 314, 320 331 353, 362
Nagative Growth	227	251, 305 to 307 343, 354, 370

Note: Column 1 shows industries which accelerated in 1980-81 to 1985-86 and column 2 shows industries which decelerated in the same period as compared to 1975-76 to 1980-81.

Source : Table 1.

Use-Based and Input-Based Criteria

During 1975-76 to 1985-86 consumer durables grew the fastest, at the rate of 9 per cent per annum. Consumer non-durables and basic goods came next with growth rates of 6 per cent per annum each Capital goods grew at a rate of 5 per cent per annum (see Table 3 for a profile of growth according to the use-based criterion)

In our sample of 49 industries all the consumer durables were in the fast-growing group and maintained relatively high shares in the manufacturing sector. Motor vehicles and electrical household goods each contributed over 3 per cent of total manufacturing value added (see Table 5 for the shares).

Table 3: Growth profile of manufacturing industries under use-based classification (1975-76 to 1985-86)

High growth industries (rate of growth > 5.37 %)	ROG	Low Growth Industries (Rate of growth < 5.37 %)	ROG	Negative Growth Industries	ROG
BASIC GOODS		BASIC GOODS		BASIC GOODS	
Fertilisers & pesticides	11.66	Iron & steel	3.53	None	
Cement,lime & plaster	11.41	Casting & forging of iron & steel	1.26		
Basic industrial chemicals & gases	5.70				
CAPITAL GOODS		CAPITAL GOODS		CAPITAL GOODS	
Drills,coal cutting & other mach	8.86	Prime movers, boilers,etc	3.10	Mach for other industries	-3.45
Machine tools	7.24	Machinery for food & textiles	0.65	Ship building	-0.85
Non-electrical machinery,n.e.c	6.70			Hand tools & hardware	-1.07
Electrical industrial machinery	8.42				
Agricultural machinery	7.11				
Wires & cables	10.08				
Locomotives & railway wagons	6.10				
INTERMEDIATE GOODS		INTERMEDIATE GOODS		INTERMEDIATE GOODS	
Tyres & tubes	8.44	Paints & varnishes	2.87	Jute textiles	-3.57
Petroleum refining	8.19	Dry & wet batteries	5.56	Petroleum & coal prod n.e.c	-5.36
Turpentine,synth resins,etc	6.05				
Other chemicals	7.03				
Plastic products,etc	12.68				
Structural clay products	4.68				
Misc non-metallic mineral products	6.68				
Fabricated metal products	8.99				
CONSUMER DURABLES		CONSUMER DURABLES		CONSUMER DURABLES	
Electrical apparatus & appliances	10.10	None		None	
Radio TV	13.11				
Motor vehicles & parts	6.80				
Computers & electronic equipment	19.35				
Motor cycles,bicycles,etc.	11.05				
CONSUMER NON-DURABLES		CONSUMER NON-DURABLES		CONSUMER NON-DURABLES	
Grain mill products	14.67	Dairy products	4.33	Cigarettes	-2.81
Sugar	10.00	Oil & vanaspati	3.30		
Bidi	10.87	Tea	2.49		
Drugs & medicines	6.76	Pulp & paper	1.09		
Woollen textiles	7.74	Printing & publishing	5.71		
Synthetic textiles	9.10	Perfumes, cosmetics,etc	3.42		
Glass & glass products	6.11	Cotton textiles	1.38		

Source :Table 1

Out of the 14 consumer non-durable industries eight grew fast. Significant among the rapidly growing consumer non-durables were synthetic and woollen textiles drugs and pharmaceuticals grain mill products and bidi. Cotton textiles, with a share of 6.36 per cent in 1985-86, and pulp and paper, with a share of 1.54 per cent were the slowest growing industries. Cigarettes showed negative growth.

Eight of the 12 intermediate goods grew fast but these did not have very high shares. Notable among these were plastic products n.e.c., tyres and tubes and fabricated metal products Growth of the petroleum refining industry increased and its share rose from 1.60 per cent in 1980-81 to 5.57 per cent in 1985-86 Jute textiles and petroleum and coal products n.e.c., had negative growth. Jute textiles however, had a relatively high share in total value-added, although it was declining.

Basic goods showed reasonably high growth rates. This is mainly accounted for by cement, lime and plaster which grew very rapidly after the partial decontrol in 1982.[7] The share of cement rose sharply from 1.13 per cent in 1981-82 to 2 per cent in 1982-83 and further to 3.18 per cent in 1985-86. Fertilisers and pesticides also grew faster than average over the period but its rate of growth fell in the eighties. Iron and steel, a major basic good industry and with a share of 8.81 per cent in 1985-86, grew much slower than average. So did casting and forging of iron and steel which had a share of 2.87 per cent. It should be noted that electricity, gas and steam, water works and supply, which are also usually classified as basic goods are not included in our set of industries.

In the capital goods sector machinery for food and textiles grew slowly and those for other industries had negative growth. Their shares also showed falling trends. Share of food and textiles machinery declined from 1.25 per cent in 1975-76 to 0.93 per cent in 1985-86 and that for other machinery fell from 1.15 per cent to 0.75 per cent over the same period. In this sector wires and cables, heavy non-electrical machinery and electrical machinery were the leading industries Seven out of the 12 industries in this group grew

Table 4: Growth profile of manufacturing industries under input-based classification (1975-76 to 1985-86)

High growth industries (rate of growth > 5.87 %)	RGG	Low Growth Industries (Rate of growth < 5.87 %)	RGG	Negative Growth Industries	RGG
AGRO BASED		AGRO BASED		AGRO BASED	
Sugar	10.60	Dairy products	4.33	Jute textiles	-1.87
Bidi	10.37	Tea	2.49	Cigarettes	-2.31
Woollen textiles	7.74	Cotton textiles	1.38		
grain mill products	14.67	Pulp & paper	1.09		
Tyres & tubes	8.44	Edible oil & vanaspati	3.30		
CHEMICAL BASED		CHEMICAL BASED		CHEMICAL BASED	
Basic ind chem & gases	5.70	Paints & varnishes	2.87	None	
Fertilisers & pesticides	11.60	Perfumes, cosmetic,etc	3.42		
Drugs & medicines	6.76	Dry & wet batteries	5.56		
Turpentine,synth resins,etc	6.05				
Other chemicals	7.03				
Plastic products n.e.c	12.68				
METAL BASED		METAL BASED		METAL BASED	
Fabricated metal products	8.99	Iron & steel	3.53	Handtools & hardware	-1.07
Agricultural machinery	7.11	Casting & forging of iron & steel	1.26	Mach for other industries	-0.45
Drills,coal cutting & other mach	8.86	Prime movers, boilers,etc	3.10	Ship building	-0.85
Machine tools	7.24	Machinery for food & textiles	0.65		
Electrical industrial machinery	8.42				
Electrical apparatus & appliances	10.10				
Locomotives & railway wagons	6.10				
Motor vehicles & parts	6.80				
Motor cycles,bicycles & scooters	11.05				
Non-electrical mach n.e.c	7.25				
MISCELLANEOUS INDUSTRIES		MISCELLANEOUS INDUSTRIES		MISCELLANEOUS INDUSTRIES	
Cement,lime & plaster	11.41	Structural clay products	4.68	Petroleum & coal prod n.e.c	-5.66
Misc non-metallic mineral products	6.68				
Petroleum refining	8.19				
Printing & publishing	5.71				
Glass & glass products	6.11				
Radio & TV	13.11				
Computers & electronic equipment	19.35				

Source: Table 1

Table 5:Share of industries in total manufacturing value-added (per cent)

Code	Industries	1975-76	1980-81	1985-86
201	Dairy products	0.55	0.40	0.40
204	Grain mill products	0.64	0.94	1.20
206	Refining of sugar	2.84	1.83	2.55
210&	211 Edible oil & vanaspati	0.96	1.09	0.96
212	Tea processing	1.79	1.14	1.88
222	Bidi	0.84	0.56	0.64
223	Cigarettes,etc	1.33	0.43	0.43
[illegible]	Cotton textiles	10.68	11.27	9.36
[illegible]	Woolen textiles	0.61	0.47	0.64
[illegible]	Synthetic textiles	2.32	2.62	2.79
[illegible]	Jute textiles	2.64	2.58	1.96
240	Pulp & paper	2.67	2.12	1.54
284&285	Printing & Publishing	1.17	1.23	1.10
300	Tyre & tube industries	1.18	1.12	1.36
303	Plastic materials n.e.c.	0.47	0.72	1.03
304	Petroleum refineries	1.68	1.60	5.57
305&306&307	Petroleum & coal products n.e.c	0.88	1.08	0.47
310	Basic industrial chemicals & gases	2.36	2.82	2.94
311	Fertilisers & pesticides	3.36	3.46	3.70
312	Paints, varnishes & lacquers	1.15	1.24	0.88
313	Drugs & medicines	3.57	3.00	3.03
314	Perfumes, cosmetics, etc	1.39	1.31	1.19
316	Turpentime, synth resin,synth fibres,etc	1.65	1.54	1.92
319	Other chemicals	0.89	0.92	0.80
320	Structural clay products	0.75	0.85	0.78
321	Glass & glass products	0.55	0.50	0.63
324	Cement, lime, plaster	1.34	1.10	3.18
329	Miscellaneous non-metallic minerals prod	0.55	7.76	0.71
330	Iron & steel industries	8.07	8.29	8.81
331	Casting & forging of iron & steel	3.41	3.22	2.87
340	Fabricated metal products	0.82	0.86	0.78
343	Hand tools & general hardware	0.95	0.95	0.59
350	Agricultural machinery & equipment	0.59	0.82	0.80
351	Drills,coal cutting & other mach	0.47	0.68	0.52
352	Prime movers, boilers ,etc	1.50	1.32	2.30
353	Machinery for food & textiles	1.25	1.39	0.93
354	Machinery for other industries	1.15	0.77	0.75
356	Non-electrical machinery n.e.c	1.30	1.48	1.52
357	Machine tools	1.05	0.86	1.10
360	Electrical industrial machinery	3.98	3.51	2.84
361	Insulated wires & cables	0.95	1.26	0.67
362	Dry & wet battery	0.48	0.46	0.38
363	Electrical apparatus, appliances &others	0.56	0.66	0.65
364	Radio & television	1.19	0.98	1.54
366	Computers & other electronic equipment	0.33	0.45	0.63
370	Ship building & repairing	0.70	0.82	0.23
371&372	Locomotives, railway wagons & parts	1.80	2.46	1.45
374	Motor vehicles & parts	3.66	3.93	4.38
375&376	Motor cycles, bicycles, scooters	0.58	0.81	1.11
	Total of 47 industries	84.70	91.65	84.80

Source: Computed from Annual Survey of Industries, various issues.

faster than average and three industries had negative growth. Interestingly, even in the machinery sector, the traditional industries like food and textile machinery, machinery for other industries, prime movers, boilers, etc. had very low or even negative growth. On the other hand, electrical industrial machinery, heavy non-electrical industrial machinery grew fast.

According to the input-based criterion (see Table 4), it is seen that the miscellaneous and chemical-based industries grew the fastest. Their growth rates were 8.6 per cent per annum and 8.2 per cent per annum respectively. Metal-based industries grew at 4.8 per cent per annum while agro-based industries lagged behind with a rate of 3.4 per cent per annum. Among the miscellaneous industries, computer and electronic equipment, radio and television and cement grew the fastest. All the chemical-based industries, except paints and varnishes perfumes and cosmetics and dry and wet batteries, grew fast. Most rapid growth was shown by plastic products n.e.c., fertilisers and pesticides and other chemicals. In the metal-based group, the leading industries were two-wheelers, electrical apparatus and appliances electrical industrial machinery, fabricated metal products and heavy non-electrical machinery.

Conclusion

The extent of industrial revival has been over-estimated in some earlier studies. Our investigation shows that although there was acceleration in the aggregate manufacturing value-added since 1975 and more in the eighties, the growth rates were lower than some earlier estimations. This is true at the disaggregate level as well.

Looking at the composition of growth, some interesting features emerge:

1. The leading industries in the recent years have been the typical sunrise industries, such as, electronics, synthetics, motor vehicles and two-wheelers.

2. Many of the industries which grew fast in the second half of the seventies decelerated in the eighties. Industries which slowed down had a combined share of over 50 per cent in total manufacturing value-added. These included the new industries also. This indicates that once the base of the new industries rose to a certain level, symptoms of sluggishness started appearing.

3. According to the use-based classification, consumer durables grew the fastest. Intermediates grew much slower than the average rate. Within the groups too, the newer industries generally grew faster than average.

4. According to the input-based classification agro-based industries lagged behind all others. Miscellaneous industries, which included most of the booming industries grew the fastest Chemical-based industries followed close behind. Metal-based industries, which includes the traditional machinery industries, grew much slower.

Notes

1. Industrial deceleration since the mid-sixties has been analysed by a number of scholars. Nayyar (1978) Ahluwalia (1985) and Krishna (1987) have surveyed the literature. The reversal in growth has been analysed by Alagh (1988), Raj (1984), Ahluwalia (1987), Chandrasekhar (1988), Nagaraj (1989), Kelkar and Kumar (1990).

2. The inadequacies of the IIP has been discussed at length by Ahluwalia (1985). Not surprisingly, she found that the IIP trend diverges widely from the value-added trend.

3. Alagh (1985) suggests 1976-77 as the cut-off year. He gives three reasons for this. First, the Indian economy surmounted the severe balance of payments problems and low domestic savings and investments of the earlier years Second, gross capital formation increased to 20 per cent in that year. Third, in that year the absolute level of public investment increased by Rs 900 crore and it has been rising since then. However, we have preferred 1975-76 as the benckmark as the rate of industrial growth was about the average in 1975-76 while it was very high in 1976-77. Sandesara (1988) finds 1975 had a growth rate of 5.3 per cent whereas 1976 recorded 12.2 per cent

4. A few related industries have been combined in groups and included in our data set although some or all items individually were below the cut-off level. Three industries viz , dairy products ship building and parts and batteries had lower value-added in 1985-86 but are chosen considering that the cut-off point was crossed in 1984-85

5. Since the WPI series with base 1980-81 is yet to be made available, we have to rely on the WPI series with 1970-71 base to deflate the value-added series.

6. In the dummy method, the growth rate is found by estimating the equation

$$\text{Ln } Y_t = a + a_1 D + bt + b_1 Dt + U_t$$

where D = 0 for the first period
= 1 otherwise.

Estimated b gives the exponential growth rate in the first period and the estimate of $(b+b_1)$ that of the second period.

7. See Studies on the Structure of the Industrial Economy, Bureau of Industrial Cost and Pricing, Vol.3, May 1987 for a survey of the cement industry. Installed capacity for the production of cement expanded from 33.17 million tonnes in 1982-83 to 42.26 million tonnes in 1985-86.

REFERENCES

1. Ahluwalia, I.J. (1982), Industrial performance in India: 1959-60 to 1978-79; An Analysis of Deceleration in Growth since the Mid-Sixties, Indian Council for Research on International Economic Relations, Delhi.

2. ---------- (1985), Industrial Growth in India: Stagnation since the Mid-Sixties, Oxford University Press, Delhi.

3. ---------- (1987) "The Role of Policy in Industrial Development" in P.R. Brahmananda and V.R. Panchmukhi (ed.), The Development Process of the Indian Economy, Himalaya Publishing House, Delhi

4. Alagh Y K. (1985) "Some Aspects of Planning Policies in India" Govind Vallabh Pant Memorial Lecture.

5. ---------- (1988) "Indian Industrialisation in the Seventies" in Y.K. Alagh (ed.) Processes of Industrial and Technological Alternatives, Indian Council for Social Science Research Delhi

6. Boyce J.R. (1986) "Kinked Exponential Models for Growth Rate Estimation", Oxford Bulletin of Economics and Statistics, Vol. 48, No.4.

7. Chandrasekhar, C.P.(1987), "Investment Behaviour, Economics of Scale and Efficiency under an Import Substituting Regime", Economic and Political Weekly, Annual Number, November.

8. ---------- (1988),"Aspects of Growth and Structural change in Indian Industry", Economic and Political Weekly, Special Number, August.

9. Goldar, B.N. and Seth, V.(1989), "Spatial variations in the Rate of Industrial Growth in India", Economic and Political Weekly, June 3.

10. Government of India (1986), "Trends in Industrial Production During the Sixth Five Year Plan, A Review", Reserve Bank of India Bulletin, May.

11. Kelkar V.L and Kumar, R.(1990) "Industrial Growth in the Eighties: Emerging Policy Issues", Economic and Political Weekly, January 27, 1990.

12. Krishna, K.L (1987) "Industrial Growth and Productivity in India" in P.R. Brahmananda and V.R. Panchmukhi (ed.), The Developpment Process of the Indian Economy, Himalaya Publishing House Delhi

13. Mundle S (1981) "Some speculations on Growth, Disparity and Capital Reorganisation in the Indian Economy", Centre for Development Studies, Trivandrum (mimeo).

14. Nagaraj R. (1989), "Growth in Manufacturing Output since 1980s: Some Preliminary Findings", Economic and Political Weekly, July 1.

15. Nayyar, D. (1978), "Industrial Development in India: Some Reflections on Growth and Stagnation", Economic and Political Weekly, Special Number, August.

16. Poirier, D.J. (1976), Econometrics of Structural Change, North Holland, Amsterdam.

17. Singh, A. and Ghosh, J. (1988), "Import Liberalisation and the New Industrial Strategy: Analysis of their Impact on Output and Employment", Economic and Political Weekly, Special Number, November.

18. Sandesara, J.C. (1988), "Indian Industrialisation: Tendencies Interpretations and Issues", in ICSSR, India Since Independence, New Delhi

Appendix A.1: Growth rates of value-added of manufacturing industries (two-digit classification)

Industries	1951/52-64/65	1964/65-74/75	1975/76-85/86
Food products	5.41	3.26	5.22
Beverages & tobacco	7.64	-0.58	2.9
Textiles	2.72	1.94	2.95
Wood products	14.39	-2.56	0.11
Paper,paper prod,printing,etc	8.57	4.93	1.33
Leather & leather prod excl footwear	5.92	-10.19	5.75
Rubber,petroleum & coal products	14.40	6.04	6.44
Chemicals & chemical products	9.88	8.10	6.53
Non-metallic minerals excl petroleum	10.87	4.99	6.24
Basic metals	12.16	3.97	3.48
Metal products excluding machinery & transport equipment	10.12	1.71	2.86
Non-electrical machinery	23.24	4.43	5.71
Electrical machinery,apparatus & appliances	17.41	10.71	9.28
Transport equipment	11.94	-4.47	8.69
Miscellaneous manufactures	12.10	4.05	9.41
Net manufacturing value added	7.88	3.60	5.18

Source: C.P.Chandrasekhar, EPW Special Number,1988, p.2361-2362

APPENDIX : A. 2

COMPOUND ANNUAL GROWTH RATES AND WEIGHTS
IN THE INDEX OF INDUSTRIAL PRODUCTION

	INDUSTRY	INDEX OF INDUSTRIAL PRODUCTION ANNUAL COMPOUND RATES OF GROWTH OF GROWTH				WEIGHTING IN THE INDEX OF INDUSTRIAL PRODUCTION	
		1961-73	1961-65	1966-68	1969-73	1960	1970
		(1)	(2)	(3)	(4)	(5)	(6)
I.	BASIC INDUSTRIES	6.72	10.4	5.9	5.2		
1.	Mining & quarrying	3.48	5.7	3.1	2.6	9.72	9.69
2.	Salt refining					0.19	0.21
3.	Heavy organic chemicals	10.30	16.4	8.1	7.9	0.10	0.54
4.	Heavy inorganic chemicals					0.[illegible]0	1.01
5.	Fertilizers	28.04	20.3	21.2	17.9	0.46	1.39
6.	Cement	5.72	6.2	4.2	4.7	1.17	1.17
7.	Iron & Steel Basic Industries	2.86	13.1	0.0	1.4	6.23	7.04
8.	Aluminium manufacturing	14.57	78.7	18.3	5.5	0.57	1.30
9.	Brass manufacturing					0.29	0.35
10.	Electricity	11.13	13.8	11.8	7.6	5.37	9.28
II.	CAPITAL GOODS INDUSTRIES	4.76	19.5	-4.8	5.4		
11.	Machinery, apparatus and supplies for power transformers	11.24	33.8	-7 7	9.6	0.38	1.48
12.	Electrical motor/ furnaces	9.23	34.4	4.1	-1.7	0.27	0.35
13.	Cables & insulated wires	7.54	14.7	-1.2	9.5	0.68	0.85
14.	Railroad equipment	-8.20	21 0	-20.4	-7 7	3.50	2.99
15.	Motor vehicles	4.68	6.3	3.2	3.5	2.51	3.03
III.	INTERMEDIATE GOODS	3.89	7 0	1.9	3.4		
16.	Cotton spinning	1.28	3.9	0.9	1.0	11.79	6.24
17.	Jute manufactures	-1.79	3.8	-7.1	-1.2	3.97	2.71
18.	Tyres & tubes	9.26	11.7	9.5	6.5	1.48	1.43

19.	Synthetic fibres	5.97	11.7	9.8	0.1	0.64	1.19
20.	Dye stuff and dyes	6.96	7.2	8.5	3.2	0.61	0.63
21.	Paint, varnish and lacquer					0.32	0.30
22.	Petroleum products	10.98	9.7	17.9	5.0	1 34	1 62
23.	Structural clay Products	11 77	4 4	23 3	11.0	0.77	0.65
24.	Batteries					0.38	0.55
IV.	CONSUMER GOODS	4.07	5.0	1 1	4.2		
V.	CONSUMER NON-DURABLES	2.81	3.8	-0.9	4 1		
25.	Sugar factories and refineries	3.24	4.5	-12.2	11 0	3 50	2.79
26.	Hydrogenated oil (Vanaspati)	4.33	4.9	3 4	-0.3	1.09	0.68
27.	Tea	2.10	2.7	-2.8	6 8	5 12	2.57
28.	Cigarettes	4.43	7.9	3.8	0.7	2.15	2.21
29.	Cotton textile weaving	-0.73	0.0	-1.3	-0.6	9.39	5.41
30.	Woollen fabrics					0.36	0.31
31.	Paper & paper products	7.32	8.0	7.9	5.3	1.61	2.24
32.	Footwear					0.43	0.44
33.	Fine & pharmaceutical chemicals	3.85	6.0	4.9	4.4	2.21	3.12
34.	Soaps & detergents	8.65	3.9	8.5	8.5	0.95	0.65
35.	Matches	-1.73	2.1	-4.1	-5.3	0.50	0.26
36.	Glass & glass products	2.10	5.6	-2.7	3.5	0.57	0.50
VI.	CONSUMER DURABLES	9.08	10.7	8.5	4.4		
37.	Commercial office & household machines	3.27	6.6	2.0	3.7	0.53	0.52
38.	Electrical appliances	7.78	8.8	3.8	8.8	0.56	0.97
39.	Communication equipment	18.80	16.8	32.9	3.9	0.61	0.48
40.	Motorcycles & bicycles	10.14	10.5	10.1	8.5	0.62	0.75
VII.	GENERAL INDEX	4.88	9.0	1.6	4.5		

Source : Studies on the Structure of Indian Economy and Planning for Development, Planning Commission, G.O.I., 1977, Table 9, Para 19.

NIPFP WORKING PAPER SERIES : 1990-91

Working Paper No.	Title	Author's Name
1/90	Economic Reforms in China and their Impact : an overview	Amaresh Bagchi (February, 1990)
2/90	A Note on the Measurement of Import Substitution	Hasheem N. Saleem (March, 1990)
3/90	Regional Pattern of Development in India	Uma Datta Roy Choudhury (April, 1990)

NATIONAL INSTITUTE OF PUBLIC FINANCE AND POLICY
NEW DELHI

LIST OF PUBLICATIONS

1. **Incidence of Indirect Taxation in India 1973-74** R.J. Chelliah & R.N. Lal (1978) Rs 10.

2. **Incidence of Indirect Taxation in India 1973-74** R.J. Chelliah & R.N. Lal (Hindi version) (1981) Rs 20.

3. **Trends and Issues in Indian Federal Finance*** R.J. Chelliah & Associates (Allied Publishers) (1981) Rs 60.

4. **Sales Tax System in Bihar*** R.J. Chelliah & M.C. Purohit (Somaiya Publications) (1981) Rs 80.

5. **Measurement of Tax Effort of State Governments 1973-76*** R.J. Chelliah & N. Sinha (Somaiya Publications) (1982) Rs 60.

6. **Impact of the Personal Income Tax** Anupam Gupta & P.K. Aggarwal (1982) Rs 35.

7. **Resource Mobilisation in the Private Corporate Sector** Vinay D. Lall, Srinivas Madhur & K.K. Atri (1982) Rs 50.

8. **Fiscal Incentives and Corporate Tax Saving** Vinay D. Lall (1983) Rs 40.

9. **Tax Treatment of Private Trusts** K. Srinivasan (1983) Rs 140.

10. **Central Government Expenditure: Growth, Structure and Impact (1950-51 to 1978-79)** K.N. Reddy, J.V.M. Sarma & N. Sinha (1984) Rs 80.

11. **Entry Tax As An Alternative to Octroi** M.G. Rao (1984) Rs 40 Paperback, Rs 80 Hardcover.

12. **Information System and Evasion of Sales Tax in Tamil Nadu** R.J. Chelliah & M.C. Purohit (1984) Rs 50.

13. **Evasion of Excise Duties in India: Studies of Copper, Plastics and Cotton Textile Fabrics (1986)** A Bagchi et. al (1986) Rs 180.

14 **Aspects of the Black Economy in India** (also known as "Black Money Report") Shankar N. Acharya & Associates, with contributions by R.J. Chelliah (1986) Reprint Edition Rs 270.

15. **Inflation Accounting and Corporate Taxation** Tapas Kumar Sen (1987) Rs 90.

16. **Sales Tax System in West Bengal** A. Bagchi & S.K Dass (1987) Rs 90

17. **Rural Development Allowance (Section 35CC of the Income-Tax Act, 1961): A Review** H.K. Sondhi & J.V.M. Sarma (1988) Rs 40 Paperback.

18. **Sales Tax System in Delhi** R.J. Chelliah & K.N Reddy (1988) Rs 240.

19. **Investment Allowance (Section 32A of the Income Tax Act, 1961): A Study** J.V.M. Sarma & H.K. Sondhi (1989) Rs 75 Paperback Rs 100 hardcover.

20. **Stimulative Effects of Tax Incentive for Charitable Contributions: A Study of Indian Corporate Sector** Pawan K Aggarwal (1989) Rs 100.

21. **Pricing of Postal Services in India** Raghbendra Jha, M.N. Murty & Satya Paul (1990) Rs 100.

---

* Available with respective publishers. Publications sent against draft/ pay order. Postage Rs 10 per copy.

NATIONAL INSTITUTE OF PUBLIC FINANCE AND POLICY
18/2, Satsang Vihar Marg
Special Institutional Area
New Delhi-110067.