

A Review of Indian Manufacturing

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I INTRODUCTION

India's industrial policy framework began to be liberalized from the late 1970s, and this process accelerated with the major economic reforms initiated in the year 1991. Industrial deregulation and liberalization have opened up opportunities for growth, but at the same time have raised many apprehensions. How has Indian manufacturing performed during this period of policy changes? What are some of the key features of its development? We examine these questions in this chapter. A major part of this chapter is based on an analysis of data from Annual Survey of Industries (ASI) for the period from 1979-80 to 1997-98. The period under study- the period from the late 1970s or early 1980s – was one of a revival of growth of Indian manufacturing according to several earlier studies (see Raj, 1984; Nagaraj, 1990; Ahluwalia, 1991; Sandes ara, 1992 on this).

The slow growth of Indian industry during the earlier period, particularly between the mid-1960s and late 1970s, was the focus of a serious academic debate (see Ahluwalia, 1985; Nayyar (ed.), 1994). According to one view, India's industrial progress was hindered due to the slow expansion of domestic demand – a consequence of the unequal income distribution and slow growth of agricultural income in the country. But the over dependence on domestic markets for industrial expansion was due to the “export pessimistic” industrial policies followed, argued another view. There were several criticisms on the country's industrial policy framework, particularly on the regime of licensing, which imposed a number of controls on industrial expansion. The controls led to economic inefficiency and resource misallocation, contended several economists (see Bhagwati and Desai, 1970; Bhagwati and Srinivasan, 1975). According to another study, the intended purpose of controls was subverted by the might of oligopoly business houses, which could preempt licensing capacity to their advantage (Bagchi, 1970; Chandrasekhar, 1988).

The measures to liberalize India's industrial policy framework from the late 1970s included deregulation and delicensing in certain industries, according a greater role to the private sector, and a gradual shift from direct physical controls to indirect controls (see Raj, 1986; Chandrasekhar, 1988; Ahluwalia, 1991, p.5). This process of liberalization greatly accelerated after 1991. According to Ahluwalia (1995, p.14), the changes that the reforms after 1991 brought in were “fundamental” in nature compared to the “marginal” changes only

in the previous decade. Import licensing was done away with for most goods except consumer goods; import-weighted tariff declined to 27 per cent from the pre-1991 level of 87 per cent; and exchange rates were devalued by 20 per cent (Ahluwalia and Little, 1998, pp. 4-5).

India's liberalization experience, its desirability and its future direction are discussed widely today, in academic and policy-making circles. The impact of reforms has been varied across different type of industries and across regions. A study of this varied growth experience will be a useful tool of analysis in any discussion on the future course of India's economic liberalization. The aim of this chapter is to make this useful contribution to literature (see also Nagaraj, 2001 for a similar study).

India's manufacturing units are classified into registered and unregistered sectors. All factories that employ more than ten workers with the aid of power and more than twenty workers without the aid of power are classified under registered manufacturing (or, broadly, the factory sector). All other manufacturing activities are classified under unregistered manufacturing. ASI covers only registered manufacturing activities. ASI summary results give information on disaggregated two-digit industries for all Indian states, for the period from 1979-80 to 1997-98. Section II of this chapter discusses the broad features of manufacturing (registered and unregistered sectors combined). Section III is on the features of registered manufacturing at a disaggregated two-digit industry level. Section IV discusses the features of registered manufacturing across Indian states. Section V concludes the chapter.

This study has used ASI data on gross value added (which is the sum of net value added and depreciation), total number of persons employed and total emoluments. A fixed capital stock series at constant prices was obtained from book value of capital reported in ASI, using perpetual inventory accumulation method. Relevant wholesale price indices with base 1981-82 have been used to deflate value figures. (For further details on the methodology adopted in this study, refer Thomas (2001)). All growth rates reported in this paper are calculated using semi-logarithmic regression on three-year moving averages. Growth rates that are not statistically significantly different from zero at 5 per cent level for a two-tailed test are reported as zero in this paper.

II. FEATURES OF MANUFACTURING: A BROAD VIEW

1. High Rates of Manufacturing Growth

The rates of growth of India's domestic economy and manufacturing for the decades starting from the 1950s are shown in Table 1. In each of these decades, manufacturing and its

two sub-sectors - registered and unregistered – grew faster than the domestic economy. After a good performance in the 1950s, growth of manufacturing and domestic economy dipped low in the next two decades, particularly in the 1960s. Growth of manufacturing and domestic economy revived in the 1980s, and further accelerated in the 1990s. Growth achieved by manufacturing and the economy in the 1990s was the highest in all the 5 decades under study.

Rates of growth of different sectors of India's economy in the 1990s are shown in Figure 1. Manufacturing, which grew at the rate of 9.3 per cent, was the fastest growing segment of India's domestic economy in the 1990s. Its growth surpassed the growth of each of the sub-sectors of tertiary sector. Within manufacturing, growth of registered sector has been faster than the growth of unregistered sector in all the five decades from the 1950s. Again, in all the decades, growth of even unregistered manufacturing was faster than the average rate of growth of domestic economy (see also Table 1).

India's recent manufacturing growth performance is respectable compared to the performance of other regions in the world. Table 2 shows this comparison using growth rates calculated by UNIDO (2001).¹ According to the UNIDO study, India's manufacturing value added grew at the rate of 7.4 per cent in each of the two periods 1980-90 and 1990-98. These growth rates were higher than the corresponding growth rates in developing countries, newly industrializing countries (NIC's), and second generation NIC's, and only slightly lower than growth rates in ASEAN countries. In the 1990s, India's manufacturing growth was higher than Korea's. However, in the 1980s and 1990s, India's manufacturing growth rates were lower than the growth rates in China and the average growth rates in South and East Asia.

Earlier studies have identified better productivity performance and public investment into infrastructure as reasons for the revival of manufacturing growth after the late 1970s (Nagaraj, 1990; Ahluwalia, 1991). According to another argument, the improved industrial performance in the 1980s and particularly after 1991 was on the basis of the increased current account deficit incurred by government (Chandrasekhar, 1988; Patnaik and Chandrasekhar, 1995). The latter argument raises serious doubts on the sustainability of the high rates of recent manufacturing growth. We will not explore these issues any further in this chapter, but

¹ The methodology and terminal and base years used by UNIDO are different from those used in our study. India's manufacturing growth rate for the period 1990-98 according to UNIDO's statistics (7.4 per cent) is lower than the growth rates calculated by our study (9.3 per cent) for the period 1991-98.

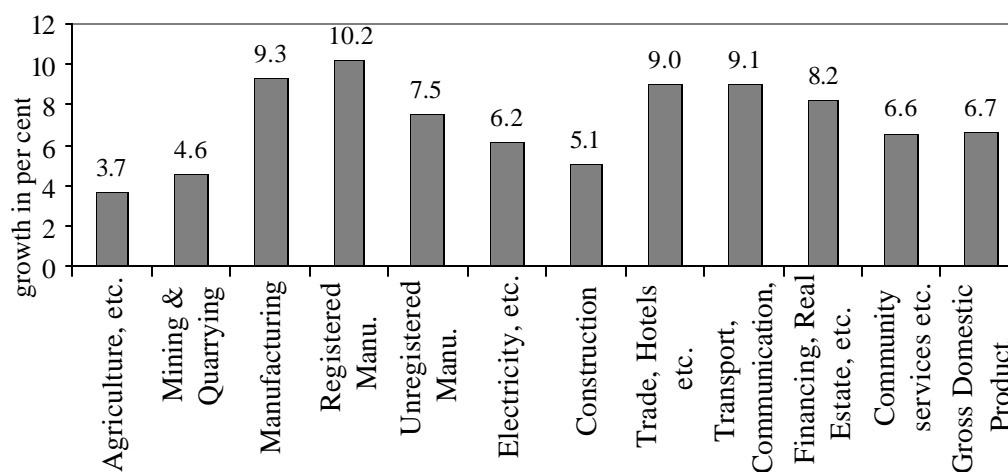
emphasize here the observed revival in India's manufacturing growth in the 1980s and its further acceleration in the 1990s.

Table 1: Rates of Growth of India's Domestic Economy and Manufacturing (at constant 1993-94 prices): 1950-1998

	Manufacturing	Registered Manufacturing	Unregistered Manufacturing	GDP at Factor Cost
1950s	6.4	7.8	5.1	3.7
1960s	4.2	4.9	3.4	3.1
1970s	5.0	5.0	5.0	3.9
1980s	7.3	8.0	6.2	5.5
1990s	9.3	10.2	7.5	6.7

Notes: 1950s: 1950-60, 1960s: 1960-70, 1970s: 1970-80, 1980s: 1980-91, 1990s: 1991-98. All growth rates are calculated using data on gross domestic product by economic activity at constant 1993-94 prices. Growth rates are calculated using semi-logarithmic regression on three-year moving averages. All growth rates are statistically significantly different from zero at 5 per cent level for a two-tailed test.
Source: National Accounts Statistics from EPW Research Foundation

Figure 1: Growth of Different sectors of India's Economy (at constant 1993-94 prices): 1990s (1991-98)



Notes: Data on gross domestic product by economic activity at constant 1993-94 prices is used for estimating growth rates. Growth rates are calculated using semi-logarithmic regression on three-year moving averages. All growth rates are statistically significantly different from zero at 5 per cent level for a two-tailed test.

Source: National Accounts Statistics from EPW Research Foundation

Table 2: India's Manufacturing Performance in a Comparative Perspective

Region	Growth of Manufacturing Value Added (in per cent)		Share of Manufacturing Value Added in GDP (in per cent)
	1980-90	1990-98	1998
India	7.4	7.4	17.6
China	10.7	14.7	37.1
Republic of Korea	12.1	6.9	30.5
South and East Asia	9	9.5	25.4
ASEAN	7.5	7.7	19.2
Newly Industrialized Countries (NIC's)	4	4.3	21.8
Second generation NIC's	7.1	6.7	23.7
Developing countries*	5.1	6.7	-
Industrialized Countries	2.8	1.6	-
World	3.1	2.6	-

Notes: * excluding China. Rates of growth of manufacturing value added at constant 1990 prices are calculated using semi logarithmic regression. Share of manufacturing in GDP for the year 1998 is estimated at current prices, and the results are provisional.

Source: UNIDO (2001), pp.34-38, Table 1.3 for rates of growth of manufacturing value added; pp.39-43, Table 1.4 for share of manufacturing in GDP.

2. Employment Generation in Registered Manufacturing: Faster in the 1990s

The 1980s is often called the decade of "jobless growth" in Indian manufacturing, for the revival in output growth in this period was not accompanied by adequate generation of employment. Only 484,000 jobs were generated in India's registered factory sector between 1979-80 and 1990-91. Several explanations have been made on this: labour retrenching was difficult after the introduction of job security regulations in the late 1970s, and this forced employers to adopt capital-intensive production techniques (Fallon and Lucas, 1993 cited in Goldar, 2000). According to another view, capital-intensive techniques were adopted because of the increase in real wages in the 1980s (Ahluwalia, 1991; Ghose, 1994). According to Nagaraj (1994), the "overhang" of employment that existed in the 1970s was intensively used in the 1980s, thus generating only a few additional employment opportunities in the later decade.

Compared to the 1980s, manufacturing growth in the 1990s was more employment generating. 1763,000 new jobs were created in India's registered manufacturing between 1991-92 and 1997-98 compared to 484,000 jobs only in the earlier decade. Goldar (2000) attributes two major reasons for this positive change: slowdown in growth of real wages and faster growth of small and medium-sized factories, which are more labour intensive than large sized factories. Nagaraj (2000) contested the views of Goldar, and argued that faster employment generation in the 1990s was due to the investment boom in that decade. In his

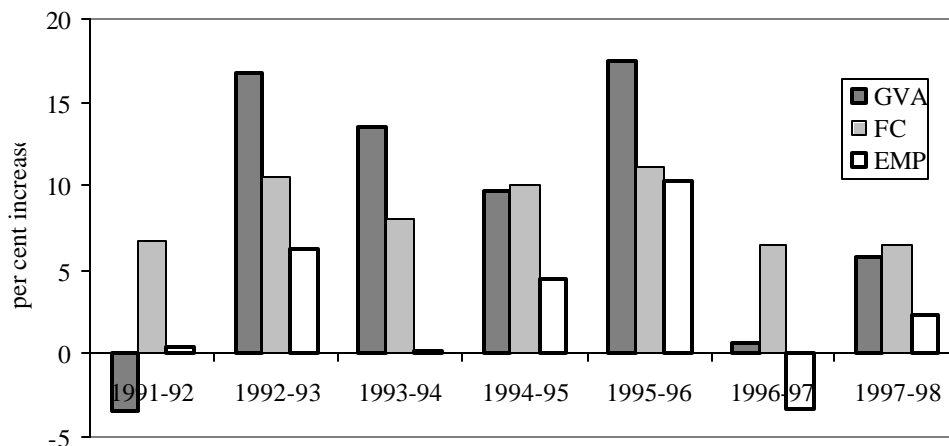
later study, Nagaraj (2001) pointed out that faster employment generation in the 1990s was only in registered manufacturing, whereas the unregistered sector witnessed negative employment growth between the mid-1980s and mid-1990s. This is an important finding because, as Nagaraj (2000) reports, almost 4/5th of India's manufacturing employment is in the unregistered sector. In later subsections, we examine industry-wise and region-wise details of employment generated in registered manufacturing alone, in the 1980s and 1990s.

3. Slowdown in Manufacturing Performance after 1995-96

Manufacturing growth was high in the decade of 1990s as a whole, but there are definite signs of a slowdown in growth in the recent years of this decade. Figure 2 shows the percentage growth of gross value added, capital stock and employment in India's factory sector, in each year during the decade of the 1990s. After a negative growth of value added in 1991-92, India's factory sector witnessed high rates of value added growth in the next four years from 1992-93 to 1995-96, with growth rate peaking at 17.5 per cent in 1995-96. With the exception of 1993-94 in regard to employment generation, there was fast growth of capital stock and employment as well, in this four-year period. But after recording the best performance in 1995-96, growth of manufacturing value added, employment and capital stock declined in the next two years, for which data are available.

Signs of a slowdown are evident if we observe the growth of total manufacturing (registered and unregistered manufacturing) as well. After peaking at 14.9 per cent in 1995-96, manufacturing growth slowed down to 7.9 per cent in 1996-97, 4 per cent in 1997-98 and 3.6 per cent in 1998-99 (see CSO, 2000, p. 15).

Figure 2: Rates of Growth over the Previous Year of Gross Value Added (GVA), Fixed Capital Stock (FC) (both at constant 1981-82 prices) and Employment (EMP) in India's Factory sector: the 1990s



Source: Calculations from ASI Summary Results, various issues

4. Size of India's Manufacturing Sector

The respectable growth performance of manufacturing, we observed above, should be seen, however, against the small size of Indian manufacturing – in terms of its share in the domestic economy and compared to manufacturing sectors of other countries. India's industrial sector could absorb only a small proportion of the country's large labour reserves. In 1994, the percentage of economically active male population engaged in industry was only 17 per cent in India, compared to a much higher 37 per cent in South Korea. (However, in China too, only 17 per cent of the corresponding population was engaged in industry)². There were only 9.89 million factory workers in India, on an average, during the three-year period 1995-98. In 1991, factory workers were only 0.98 per cent of the total population and 2.87 percent of all main workers in the country³.

Share of manufacturing in India's domestic economy is low (see Figure 3). It was 17.7 per cent in 1997-98, with shares of registered and unregistered sectors being 11.8 per cent and 5.9 per cent respectively. These shares were even lower in 1980-81: manufacturing - 13.8 percent, registered manufacturing - 8.1 percent, and unregistered manufacturing - 5.8

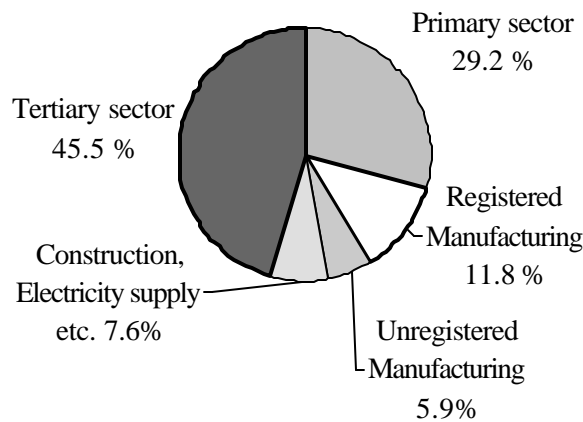
² Source: *World Development Indicators*, 1998, The World Bank, Washington, pp. 12-14.

³ Notes: Factory workers correspond to "Total Employees" reported by ASI. Source: For main workers: *Census of India 1991 Series - I*, India, paper 3 of 1991. For employees in registered manufacturing: three-year average for the period 1989-92, ASI Summary Results for Factory sector, various issues.

percent.⁴ Share of manufacturing is much higher in the domestic economies of other industrializing regions. In 1998, this share was 37.1 per cent in China, 30.5 per cent in South Korea, 25.4 per cent on an average in the countries in South and East Asia, and 21.8 per cent on an average in the NIC's, compared to 17.6 per cent only in India (see Table 2).

In 1996, India's manufacturing value added was less than 1/4th of China's (see Table 3). Manufacturing value added in South Korea, whose population was less than 1/20th of India's, was almost twice the value added in India. India's per capita manufacturing value added in 1996 was only \$75 compared to \$ 2740 in South Korea, and \$255 in China. Per capita manufacturing value added in India was even lower than the average for low-income countries.

Figure 3: Share of Different Sectors in India's Gross Domestic Product (at constant 1993-94 prices) in 1997-98



Source: CSO (2000) p.17

⁴ Shares in GDP at factor cost at constant 1993-94 prices. Source: CSO (2000) p. 15; EPW Research Foundation for data for the period before 1993-94.

Table 3: Size of Manufacturing Sectors in Selected Regions of the World, 1996

	Manufacturing Value Added	Population	Per capita Manufacturing Value Added
	In \$Millions	In Millions	in \$
1 East Asia & Pacific	512661	1732	296
2 China	309857	1215	255
3 South Korea	126042	46	2740
4 Low Income Countries	383758	3236	119
5 South Asia	91208	1266	72
6 India	71205	945	75
7 Gujarat	8423	46	183
8 Assam	573.2	25	23

Notes: Value added is at constant 1987 prices (US \$).

Source: For international data: *World Development Indicators*, 1998, The World Bank, Washington, pp. 12–14 and pp. 180-182. For Indian States, ASI Summary Results for Factory sector, various issues, and CSO (1999)(for population figures).

III FEATURES OF MANUFACTURING: AT A DISAGGRAGATED INDUSTRY LEVEL

The observations made so far were on the features of manufacturing (registered and unregistered) at an aggregate level. In sections III and IV, we examine the features of registered manufacturing (or factory sector) alone using data from ASI. ASI publishes information about industries at disaggregated sectoral level, each of which is indicated by a two-digit number. For example, the two-digit number 22 refers to manufacture of beverages, tobacco, etc. In Appendix, we have given the names of industries and the two-digit numbers by which they are referred to. Generation, transmission and distribution of electricity (two-digit industry, 40) is not a manufacturing activity, but is still considered in this analysis.

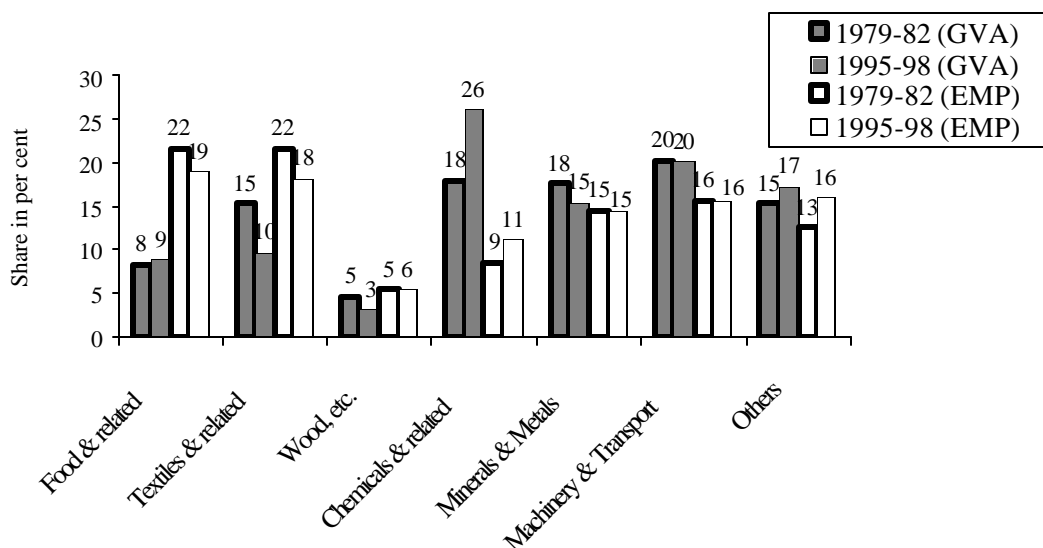
1. Structure of Indian Manufacturing

What is the structure of India's manufacturing, and how has it changed over the past two decades? This section studies the structure of Indian manufacturing at two three-year time periods, 1979-82 and 1995-98. The 24 two-digit industries are grouped into 7 categories: Food & related (industry groups: 20-21, 22); Textiles & related (23,24,25,26); Wood, Leather and Paper (27,28,29); Chemicals and related (30, 31); Minerals, Metals & Metal products (32,33,34); Machinery & Transport (35-36, 37); and Others (38,39,40,41,42, 43,74,97) (See Figure 4).

Share in Value Added: Increasing Importance of Chemicals, Decreasing Importance of Textiles

In terms of value added, the leading industrial activity in India today is the manufacture of chemicals, rubber, petroleum and allied products. Relative importance of this category of industries grew considerably during the last two decades; their combined share in total value added was 18 per cent in 1979-82 and 26 per cent in 1995-98. Manufacture of machinery and transport equipment is another important industrial activity, adding a share of about 1/5th in the total value added, throughout the period under study. On the other hand, textiles and allied industries went down in relative importance during the period; combined share of these industries decreased from 15 per cent to 9.7 per cent (See Figure 4).

Figure 4: Two-digit industries in Indian Manufacturing: Shares in Gross Value Added (GVA) and Employment (EMP), Three-Year Averages, 1979-82 and 1995-98



Source: Calculations from ASI Summary Results, various issues

Share in Employment: Continued Importance of Food and Textiles

Which are the major employment generating industries? The leading industry categories in terms of manufacturing employment are different from those in terms of value added. Manufacture of products related to food and textiles are the industries that employ the largest number of factory workers in India. Each of these two categories of industries had a share of almost 1/5th of the country's total factory employment in 1979-82 as well as in 1995-98. Note that the shares of both these industries in total value added are much less: the shares were less than 1/10th in 1995-98. Note also that textiles' share in total value added has come

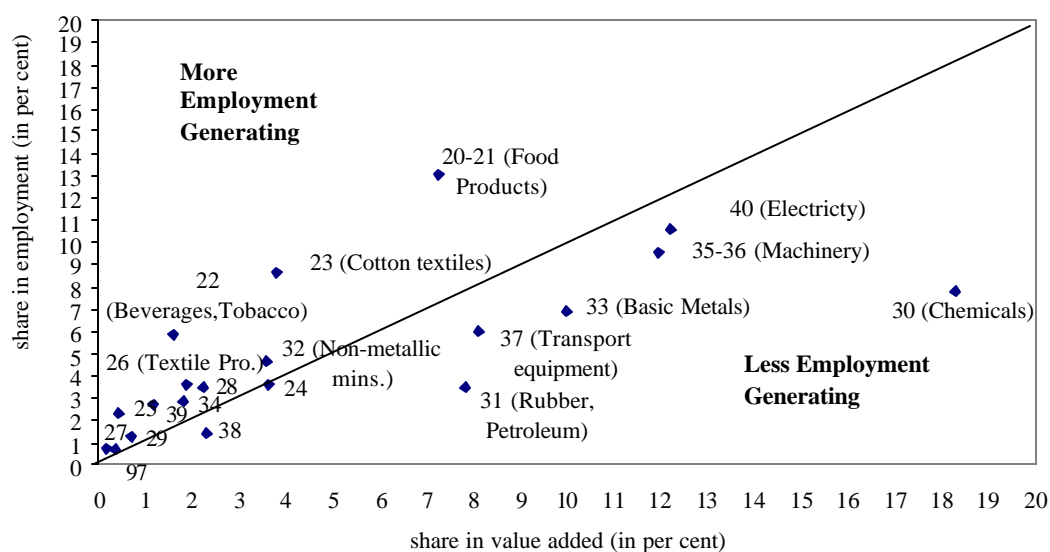
down, but irrespective of this, this industry category continues to be a major source of employment (See Figure 4).

Thus an Asymmetry between Shares in Employment and Value Added

At the other end, manufacture of chemicals, rubber, petroleum and allied products - the industry category whose share in total value added is the largest and is expanding - has a relatively smaller share in employment (see Figure 4). In 1995-98, this category of industries, which had a share of 26 per cent of total manufacturing value added, employed only slightly more than 11 per cent of India's factory employees.

This asymmetry in shares, with relative importance in terms of value added and employment tilting between different sets of industries, is well illustrated in Figure 5. Here two-digit industries are shown on a scatter diagram, with shares in value added plotted on the x-axis and shares in employment plotted on the y-axis. Industries lying below the diagonal - manufacture of chemicals (30) and rubber and petroleum (31), etc. - have relatively larger shares in value added compared to their shares in employment. On the other hand, those lying above the diagonal - manufacture of food products (20) and cotton textiles (23), etc. - have larger shares in employment compared to their shares in value added.

Figure 5: Two-Digit Industries in India's Factory sector: Shares in Gross Value Added and Employment, Three-Year Averages, 1995 -98



Source: Calculations from ASI Summary Results, various issues

Summary

Among all the industries today, manufacture of chemicals and related products has the largest share in value added. In total value added, the share of this industry increased, whereas the share of textiles and related industries decreased, significantly, in the past two decades. On the other hand, manufacture of textiles and food products continue to be major sources of factory employment in the country.

2. Growth in Value Added of Two-Digit Industries

Value added by India's factory sector grew at the rates of 7.3 per cent and 10.8 per cent respectively in the 1980s and 1990s. Growth rates varied widely across the two-digit industries, and, for the same industry, between the two decades.

The following scatter diagram shows rates of growth of gross value added in two-digit industries, with rates of growth in the 1980s plotted on the x-axis and rates of growth in the 1990s plotted on the y-axis (see Figure 6). The origin of the scatter diagram coincides with the growth rates for factory sector or total registered manufacturing (7.3, 10.8). The origin thus represents the average growth rates of two-digit industries in India's factory sector in each decade. Industries, whose growth rates are above the average for factory sector in the 1980s and 1990s, lie in the first quadrant of the scatter diagram; and whose growth rates are above the average in the 1990s but below the average in the 1980s lie in the second quadrant. Similarly the other two quadrants are defined and shown on the diagram.

Variation in Growth Rates Across Industries: Wider in the 1990s

In the 1980s, rates of value added growth varied from as high as 15 per cent in the manufacture of rubber, petroleum etc. (31) to no statistically significant growth in jute industry (25). Variation in growth rates across industries increased further in the 1990s. Manufacture of transport equipment (37), basic metals (33) and metal products (34) had very high rates of growth in the 1990s; their rates of growth were 21 per cent, 16 per cent and 14 per cent respectively. At the same time, in the 1990s, there was no statistically significant growth in four industries - manufacture of wool and silk (24), textile products (26), wood products (27) and leather (29) (see Figure 6).

Chemicals and Food Products: High Rates of Growth in the 1980s and 1990s

Jute and Cotton Textiles: Low Rates of Growth in the 1980s and 1990s

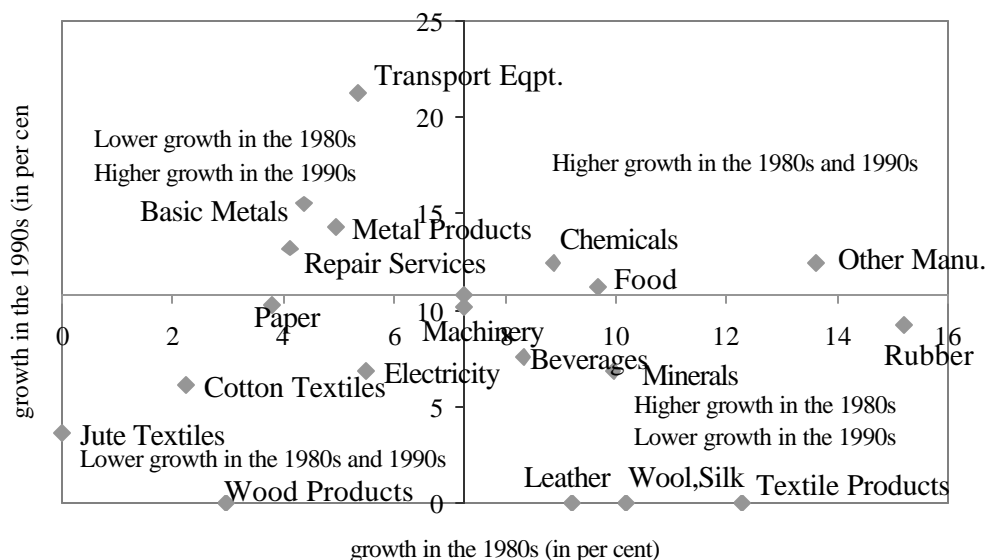
Manufacture of food products (20-21), a relatively labour-intensive industry, and manufacture of chemical products (30), a relatively capital-intensive industry, had rates of growth above those of factory sector in the 1980s and 1990s. These industries, both of which lie in the first quadrant of the diagram (see Figure 6), were the two consistently high growth performers during the period under study. On the other hand, manufacture of jute (25) and cotton textiles (23), both of which lie in the third quadrant, had rates of growth below the average for factory sector in the 1980s and 1990s. It may be noted, however, that growth improved in the 1990s in both these industries: in cotton textiles rate of growth increased to 6 per cent from 2 per cent only in the 1980s; in jute textiles, to 3.6 per cent from zero growth in the 1980s (see Figure 6).

Transport Equipment, Basic Metals and Metal Products: Upturn in Growth in the 1990s

Several Labour- Intensive Industries: Downturn in Growth in the 1990s

For the three industries that lie in the second quadrant of the scatter diagram - manufacture of transport equipment (37), basic metals (33) and metal products (34) - rates of growth were less than the average (for factory sector) in the 1980s but were the highest among all industries in the 1990s. It appears that these industries have benefited the most from the policy changes in the 1990s. On the other hand, the three industries that lie in the fourth quadrant - manufacture of textile products (26), wool and silk (24), and leather (29) - had rates of growth of over 9 per cent in the 1980s, but no statistically significant growth in the 1990s. These and most of the other industries that had slow rates of growth in the 1990s - manufacture of wood products (27), jute textiles (25), cotton textiles (23), beverages and tobacco (22) - are relatively labour intensive.

Figure 6: Rates of Growth of Gross Value Added (at constant 1981-82 Prices): Two-Digit Industries, India's Factory Sector, 1980s and 1990s



Notes: The origin of the scatter diagram coincides with rates of growth of total registered manufacturing in India (7.3 per cent in the 1980s and 10.8 per cent in the 1990s). For industry groups that fall in quadrant I of the scatter diagram, growth rates are higher than 7.3 per cent in the 1980s and 10.8 per cent in the 1990s. Similarly for other quadrants. 1980s: 1979-80 to 1990-91, 1990s: 1991-92 to 1997-98. All growth rates are calculated using semi-logarithmic regression on three-year moving averages. Growth rates that are not statistically significantly different from zero at 5 per cent level for a two-tailed test are reported as zero in this scatter diagram.

Source: Calculations from ASI Summary Results, various issues

Summary

Manufacture of chemicals and food products had consistently high rates of value added growth in the 1980s and 1990s. On the other hand, growth rates of jute and cotton textile industry were below the average for factory sector in both the decades. Manufacture of basic metals and transport equipment had the highest rates of growth in the 1990s, although their growth rates were below the average for factory sector in the 1980s. On the other hand, several labour-intensive industries – manufacture of textile products, leather, beverages and tobacco, etc. -- had a steep fall in growth rates in the 1990s, after a relatively high growth performance in the earlier decade.

3. Two-Digit Industries: Investment and Growth of Employment

Investment and employment growth across industries in registered manufacturing in the 1980s and 1990s are discussed in this section (see Table 4). Investment is addition to fixed capital stock (at constant 1981-82 prices) in each year. The omission of data on unregistered manufacturing is a major draw back on the industry-wise pattern of employment generation we are presenting here.

Major Generators of Employment in the 1990s

In the 1990s, the largest numbers of jobs were generated by the manufacture of chemicals (30) and food products (20-21) – the former a capital intensive and the latter a labour-intensive industry (see Table 4). Manufacture of textile products (26), repair of capital goods (39) and manufacture of beverages and tobacco (22) were the other labour-intensive industries that were major generators of employment in the 1990s. Electricity (40), and manufacture of rubber and petroleum (31) were two other capital-intensive industries, which recruited large number of employees in the 1990s.

Chemical and Food Products: High Employment Generation, High Investment, High Value Added Growth

Manufacture of chemicals (30) and food products (20-21), the two industries that generated the largest number of new jobs in the 1990s, had consistently high rates of value added growth, and also had reasonably large shares of investment moving into them. Of the total manufacturing investment, chemicals (30) received shares of 13 per cent and 16 per cent respectively in the 1980s and 1990s. Food industry's share of the total investment was approximately 5 per cent in the two decades.

Several Labour-Intensive Industries: High Employment Generation, Low Investment, Low Value Added Growth

Different from the above pattern are the growth experiences of the three labour-intensive industries - manufacture of textile products (26), repair of capital goods (39) and manufacture of beverages and tobacco (22). These industries were the major generators of

employment in the 1990s, but the shares of investment into each of these industries were very low. Manufacture of textile products and beverages and tobacco had major downturn in value added growth in the 1990s. Manufacture of textile products (26) did not witness any significant value added growth in the 1990s but still generated 198,000 jobs. However, in the earlier decade, this industry had grown at over 12 per cent but generated only 66,000 jobs.

Basic Metals: Low Employment Generation, High Investment, High Value Added Growth

Contrastingly, manufacture of basic metals (33) – a capital-intensive industry, which had among the fastest rates of value added growth in the 1990s and received major shares of investment in the 1980s and 1990s – did not generate many jobs in the 1990s. This industry generated less number of jobs in the 1990s than in the 1980s, though growth in value added was much faster in the former decade. Similarly, manufacture of transport equipment did not generate many jobs in the 1990s, irrespective of the high rates of value added growth it achieved in the decade (see Table 4).

Job Losses in the 1980s: in Cotton Textiles, Jute Textiles, Repair Services

Job Creation in the 1990s: in Textile Products, Repair of Capital Goods

In the "jobless decade" of 1980s, 307,000 employees either lost their jobs or had to move out of factories and find employment in the unorganized sector, in India's cotton textile industry (23); 90,000 employees were similarly affected in repair services (97), 88,000 in jute industry (25) and 81,000 in food industry (20-21). In total, 503,000 factory jobs were lost in the 1980s. As against this, industries like electricity (40), manufacture of machinery (36-36), etc., which generated employment in this decade, could generate a total of only 987,000 new jobs (see Table 4).

Among the industries which considerably reduced their labour force in the 1980s – cotton textiles, jute textiles, repair services and food industry –, only food industry generated adequately large number of jobs in the 1990s to make up for the loss in the earlier decade. In cotton textiles (23), only 36,000 new jobs were created in the 1990s for the loss of 317,000 jobs in the 1980s. However, job losses in the earlier decade in cotton textiles and repair services were compensated to a certain extent in the 1990s, by a new set of related industries. Thus 198,000 new jobs were created in the manufacture of textile-products (26) in the 1990s. Similarly, for the loss of 90,000 jobs in repair services (97) in the 1980s, 155,000 new jobs were created in the repair of capital goods (39) in the 1990s. The former is mostly the repair of footwear, household appliances and two-wheelers while the latter is the repair of heavy industrial machinery (see Table 4).

Skewed Nature of Investment

Manufacturing investment displayed similar industry-wise patterns in the 1980s and 1990s. In both the decades, the largest shares of investment moved into the manufacture of chemicals (30) and basic metals (33). On the other hand, very low shares of investment –of less than 0.5 per cent – moved into many of the labour intensive industries, particularly jute (25), wood products (27) and leather (29). Again, manufacture of textile products (26) and beverages and tobacco (22) –both among the major generators of employment in the 1990s and the former an export oriented industry- received only slightly over 1 per cent of total investment (see Table 4).

Summary

All the two-digit industries recruited new employees in the 1990s - unlike in the 1980s when several industries reduced the size of their labour force. Among the major generators of employment in this decade, a few industries were labour-intensive, and a few others, capital-intensive. Among the labour-intensive industries that were also major generators of employment, there were many, which received very low shares of total manufacturing investment and also had only slow growth in value added. On the other hand, a few capital-intensive industries, which received major shares of investment and also had high rates of value added growth, generated only very little employment.

Table 4: Increase in Employment and Share of Total Manufacturing Investment: Two-Digit Industries, Factory sector, 1980s and 1990s

Increase in Employment			Share of Manufacturing Investment		
Name of the Industry	in actual numbers '000		Name of the Industry	in per cent	
	1980s	1990s		1980s	1990s
Food (20-21)	-81	239	Electricity (40)	30.8	24.6
Chemicals (30)	56	239	Chemicals (30)	13.2	16.2
Electricity (40)	185	212	Basic Metals and Alloys (33)	15.3	13.6
Textile Products (26)	66	198	Machinery & Equipment (35-36)	6.8	6.2
Repair of Capital Goods (39)	0	155	Rubber, Petroleum (31)	5.1	5.8
Beverages, Tobacco (22)	84	112	Food (20-21)	5.0	5.5
Rubber, Petroleum (31)	67	99	Non-metallic Mineral Products (32)	5.3	5.2
Transport Eqpt. (37)	-7	77	Cotton Textiles (23)	3.7	5.1
Wool, Silk (24)	72	61	Transport Eqpt. (37)	3.8	4.2
Other Manu. (38)	19	58	Wool, Silk (24)	3.2	4.1
Metal Products and Parts (34)	23	54	Paper & Paper Products (28)	3.2	3.0
Machinery & Equipment (35-36)	112	53	Metal Products and Parts (34)	1.2	1.6
Paper & Paper Products (28)	10	52	Textile Products (26)	0.5	1.2
Basic Metals and Alloys (33)	66	44	Beverages, Tobacco (22)	0.8	1.1
Cotton Textiles (23)	-307	36	Other Manu. (38)	0.5	0.8
Leather (29)	43	18	Repair of Capital Goods (39)	0.0	0.4
Jute (25)	-88	15	Leather (29)	0.4	0.4
Non-metallic Mineral Products (32)	92	12	Wood Products (27)	0.2	0.2
Wood Products (27)	-20	10	Repair Services (97)	0.1	0.2
Repair Services (97)	-90	3	Jute (25)	0.4	0.2
Total (Factory sector)	484	1763	Total (Factory sector)	100.0	100.0

Notes: 1980s: 1979-80 to 1990-91, 1990s: 1991-92 to 1997-98. Investment is addition to fixed capital stock (at constant 1981-82 prices).

Source: Calculations from ASI Summary Results, various issues

4. Characteristics of Two-Digit Industries

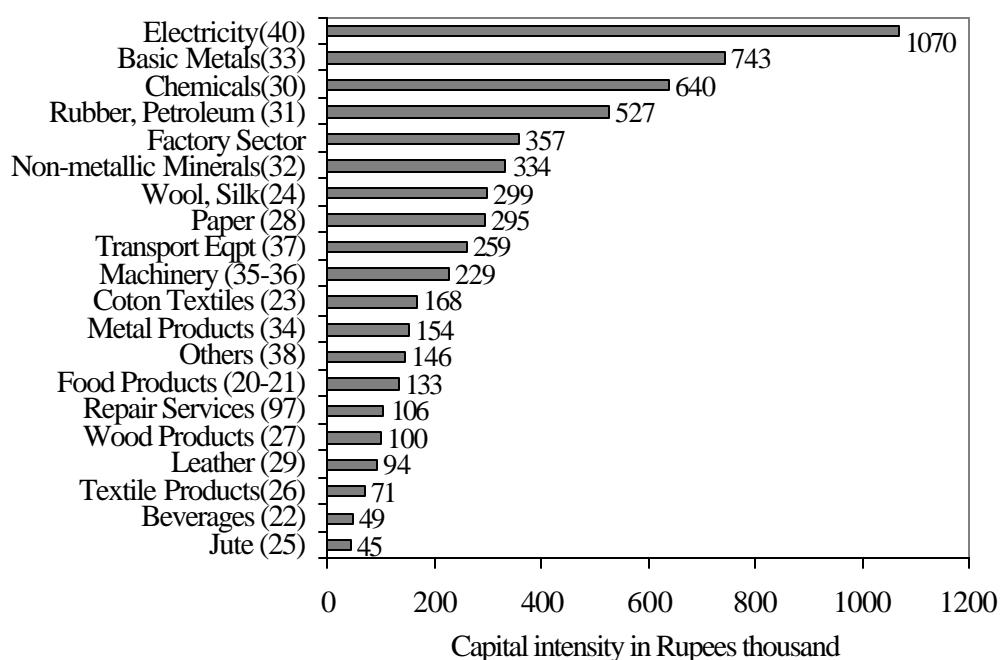
What are the characteristics of India's industries at a two-digit level? How much do capital intensity (fixed capital stock per employee), labour productivity (gross value added per employee) and emoluments per employee vary across industries and between the two three-year time periods? Variation across industries, structure of each industry and variation between the two time periods are shown respectively in major columns I, II and III of Table 5.

Variation across Industries

Capital intensity (or, conversely, labour intensity) varies widely across the different two-digit industries (see Figure 7). In 1995-98, it was the lowest in jute textiles (25) and highest in the generation, transmission and distribution of electricity (40). If the average capital intensity in factory sector in 1995-98 were 100, it was as high as 208 in the manufacture of basic metals and only 13 in jute textiles (see Table 5, major column I). Value added by an employee in chemical industry was 2.35 times the value added in factory sector

on an average; it was only 0.18 times in jute textiles. An employee in chemical industry received 1.55 times the emoluments received by an average factory employee; an employee in beverages and tobacco industry received only 0.25 times. Labour productivity, capital intensity and emoluments per employee are above the factory sector average in the manufacture of chemicals (30), rubber and petroleum (31) and basic metals (33). Industries, which have relatively higher levels of capital intensity, have higher levels of labour productivity as well. Employees are also paid better in these industries (see Table 5, major column I).

Figure 7: Capital Intensity Across Industries in India's Factory Sector, 1995-98: Three-Year Averages, in Rupees Thousand at Constant 1981-82 Prices



Source: Calculations from ASI Summary Results, various issues

An Average Factory Employee: in Different Industries

If the average employee in each industry were made available a fixed capital stock of Rs. 100, value added by him would be Rs. 43 in textile products and Rs. 31 in the manufacture of machinery but only Rs. 11 in the manufacture of basic metals and Rs. 15 in cotton textiles (see Table 5, major column II). Clearly, capital requirement per unit of value added is much higher in the latter set of industries. Not all labour intensive industries have lower capital requirement per unit of value added. An example is cotton textiles, whose relatively low levels of value added per unit of fixed capital stock is an indication, most

likely, of poor capital utilization. The contrast between cotton textiles and manufacture of textile products – the latter having a much better capital utilization- may be noted here.

Emoluments received and value added by an employee in cotton (23) and jute (25) textiles are lower than the factory sector average (see Table 5, major column I). But employees in these industries obtain larger shares of value added, which is probably an indication of the bargaining strength of trade unions in these industries. In jute industry, if fixed capital stock per employee is Rs. 100, value added by the employee is Rs. 23, and emoluments received by him is Rs. 20 (see Table 5, major column II). On the other hand, in a capital-intensive industry like manufacture of basic metals (33), an average employee received emoluments of Rs.3 and added value of Rs.11 for every Rs.100 of fixed capital stock invested. An employee in the manufacture of chemical products – another capital-intensive industry having the best growth performance in the past two decades - received only slightly higher emoluments (Rs.4), but added much higher value (Rs.21) compared to a similar employee in the manufacture of basic metals (see Table 5, major column II).

The Changes: Between 1979-82 and 1995-98

The highest increase in capital intensity occurred in the manufacture of non-metallic mineral products (32) and cotton textiles (23) (see Table 5, major column III). In cotton textiles this has not led to a corresponding increase in labour productivity; the increase in labour productivity in this industry was among the lowest. There was significant increase in labour productivity in the manufacture of food products (20-21), transport equipment (37), rubber (31) and chemicals (30). In these industries, emoluments received by an employee too increased simultaneously. Employees in food industry had among the highest increase in emoluments (see Table 5, major column II).

Table 5: Characteristics of Two-Digit Industries in India: Indices of Capital Intensity (CAP), Labour Productivity (VA) and Emoluments Received per Employee (EMOL), 1995-98

	I			II			III		
	Differences between Industries			Structure of each Industry			Increase over 1979-82		
	Manufacturing =100			CAP =100			1979-82 =100		
	CAP	VA	EMOL	CAP	VA	EMOL	CAP	VA	EMOL
Food Products (20-21)	37	55	59	100	24	7	400	388	276
Beverages (22)	14	28	25	100	33	8	437	245	133
Cotton Textiles (23)	47	44	70	100	15	7	505	179	138
Jute Textiles (25)	13	18	56	100	23	20	358	109	133
Textile Products (26)	20	52	52	100	43	12	245	225	144
Wood Products (27)	28	24	29	100	14	5	405	131	100
Paper Products (28)	83	65	86	100	13	5	337	189	149
Leather (29)	26	54	64	100	33	11	224	232	144
Chemicals (30)	179	235	155	100	21	4	251	311	189
Rubber, Petroleum (31)	147	226	142	100	25	4	273	322	208
Non-met. Mineral Pr. (32)	94	77	65	100	13	3	555	293	158
Basic Metals (33)	208	144	121	100	11	3	305	260	148
Metal Products	43	63	80	100	23	8	356	175	143
Machinery (35-36)	64	125	141	100	31	10	324	256	190
Transport Eqpt. (37)	73	136	163	100	30	10	260	332	207
Other Manu. (38)	41	158	170	100	62	19	280	464	311
Electricity (40)	300	116	112	100	6	2	182	239	178
Factory sector	100	100	100	100	16	4	278	283	185

Notes: CAP is fixed capital stock per employee; VA is gross value added per employee. All value figures are at constant 1981-82 Rupees.

Source: Calculations from ASI Summary Results, various issues

IV. REGION-WISE ASPECTS OF REGISTERED MANUFACTURING

1. Regional Composition of Indian Manufacturing

Indian states differ greatly in the size of their manufacturing sectors, and in the composition of their manufacturing output. Table 6 shows the shares in total value added and major industrial output of 17 major states. The 17 states, which together accounted for 96.3 per cent of the total value added by India's factory sector in 1995-98, are categorized into 6 groups – North, North-West, South, West, East and Central-East (see Table 6).

Western and Southern states: The Leading Industrial Regions

The two western states of Maharashtra and Gujarat constitute the leading industrial region in India. These states together account for approximately 1/3^d of India's manufacturing value added. Chemicals and related products are the major manufacturing output of this region. The combined shares of chemicals, rubber and petroleum (30 and 31) in the manufacturing sectors of Maharashtra and Gujarat were as high as 33.8 per cent and 57.5 per

cent respectively in 1995-98. The southern region comes next in importance in Indian manufacturing; the four southern states together had a share of almost a quarter of the country's manufacturing value added. The size of manufacturing sectors varied among these four states: from large in Tamil Nadu, to medium in Andhra Pradesh and Karnataka, and to small in Kerala. Unlike in the two western states, the major industrial activity in this region is the manufacture of machinery and transport equipment or metals and mineral based products (there is a close association between the two categories of industries mentioned). An exception is Kerala - whose share in India is small and that too falling -, which produces chemical and related products.

Eastern States: Declining in Importance

The three eastern states, West Bengal, Bihar and Assam lost their relative importance in Indian manufacturing, considerably, in the two decades under study. The combined share of these states in the country's total manufacturing value added fell from 17 to 10.8 percent; the share of West Bengal shrunk by half, from 9.8 per cent to 5.3 percent. Like in the southern states - and unlike in the western states - manufacturing sectors of the eastern states too are oriented to the production of machinery and transport equipment or metals and mineral based products.

Central-East and North-West: Increasing in Importance

Metals and mineral based products are the major manufacturing output from both Madhya Pradesh and Orissa. But unlike the eastern states, both these states have increased their shares in India's total manufacturing value added.

Among the four states -Uttar Pradesh, Haryana, Punjab and Rajasthan - only Punjab had a decline, and that too marginal, in their respective shares in India's manufacturing. The combined share of these four states increased from 16.7 per cent to 18.9 per cent. Major manufacturing output is chemicals and allied products in Uttar Pradesh; machinery and transport equipment in Haryana and Punjab; and textiles and related products in Rajasthan. The manufacturing sectors in the northern most states of Himachal Pradesh and Jammu and Kashmir are extremely small in size.

Table 6: Manufacturing Sectors of Indian States: Size and Composition of Output, Factory Sector, 1979-82 and 1995-98

		Size of Manufacturing Sector		Composition of Manufacturing Output	
		Share (in per cent) in India's Total Manufacturing (Gross) Value Added		Major Industry Category	Share (in per cent) of this Category in Total Manufacturing (Gross) Value Added by the State
		1979-82	1995-98	1995-98	1995-98
1	Maharashtra	23.5	21.9	Chemicals	33.8
2	Gujarat	9.4	11.8	Chemicals	57.5
	West	32.9	33.7		
3	Tamil Nadu	9.9	9.7	Machinery	24.4
4	Andhra Pradesh	5.0	6.9	Metals	26.3
5	Karnataka	5.0	5.5	Machinery	31.2
6	Kerala	3.1	2.0	Chemicals	39.8
	South	23.0	24.0		
7	Uttar Pradesh	7.6	9.1	Chemicals	24.4
8	Haryana	3.0	3.4	Machinery	59.3
9	Punjab	3.3	3.2	Machinery	21.3
10	Rajasthan	2.9	3.1	Textiles	21.8
	North-West	16.7	18.9		
11	West Bengal	9.8	5.3	Machinery	19.9
12	Bihar	6.1	4.7	Metals	52.2
13	Assam	1.2	0.8	Chemicals	43.5
	East	17.0	10.8		
14	Madhya Pradesh	5.0	6.0	Metals	38.5
15	Orissa	1.9	2.1	Metals	35.7
	Central-East	6.9	8.1		
16	Himachal Pradesh	0.6	0.7	Textiles	28.1
17	Jammu & Kashmir	0.2	0.1	Metals	17.3
	North	0.8	0.8		
1-17		97.3	96.3		
	India	100	100	Chemicals	26.1

Notes: All shares are three-year averages in percent. "Chemicals" is the industrial category that refers to industry groups 30 and 31 combined. Similarly "Textiles" refers to industry groups 23, 24, 25 and 26; "Machinery" to the groups 35-36 and 37; "Metals" to the groups 32, 33 and 34; "Food" to the groups 20-21 and 22; "Wood, Leather and Paper" to the groups 27,28 and 29; "Others" to the groups 38,39,40,41,42,74 and 97. The category, "Others", was not considered in the choice of major industrial category. Source: Calculations from ASI Summary Results, various issues

2. Location of India's Two-Digit Industries

Table 7: Share of Different Regions in Gross Value Added by Selected Two -Digit industries: India's Factory Sector, Three-Year Averages, 1979 -82 and 1995 -98

		West	South	North-West	East	Central - East	North	India
Food Products (20-21)	1979-82	23.8	28.9	24.9	16.3	2.7	0.2	100
	1995-98	26.1	30.9	26.1	8.6	5.6	0.5	100
Cotton Textiles (23)	1979-82	50.4	24.9	12.3	4.6	5.6	0.0	100
	1995-98	26.4	46.6	12.6	3.3	8.3	1.1	100
Chemicals (30)	1979-82	56.0	21.0	9.9	6.6	2.9	0.5	100
	1995-98	60.3	16.2	12.8	2.6	3.5	0.4	100
Rubber, Petroleum (31)	1979-82	35.3	20.0	14.8	28.6	0.3	0.1	100
	1995-98	40.1	23.1	15.4	11.6	3.7	0.3	100
Basic Metals & Alloys (33)	1979-82	16.0	11.0	11.1	35.6	24.7	0.1	100
	1995-98	16.5	18.0	10.8	29.2	24.2	0.2	100
Machinery (35-36)	1979-82	35.0	27.1	17.3	10.0	4.6	0.2	100
	1995-98	34.9	29.6	20.4	6.5	4.0	0.9	100
Manufacturing (Factory sector)	1979-82	32.9	23.0	16.7	17.0	6.9	0.8	100
	1995-98	33.7	24.0	18.9	10.8	8.1	0.8	100

Note: see Table 6 for states under each region

Source: Calculations from ASI Summary Results, various issues

Chemical Industries Concentrated in the West; Textiles Shifting to the South; Basic Metals Located in the East; Machinery, in the West and South; and Food Products Rather Dispersed

This sub-section discusses location of selected two-digit industries in India. There is heavy regional concentration in India's chemical industry. In the manufacture of chemicals (30), the two western states had a combined share of 56 per cent in 1979-82 and an even larger 60.3 per cent in 1995-98. Similarly, in the manufacture of rubber, coal and petroleum (31), these two states had shares of 35.3 per cent and 40.1 per cent respectively at the two time points.

There is regional concentration in cotton textile industry as well, but the region of concentration changed in this industry during the two decades. In 1979-82, the western states

had a combined share of 50 per cent and the southern states' share was only 25 per cent. By 1995-98, the balance tilted with the southern states having a share of 46.6 per cent and the western states, having a share of 26.4 per cent. The major regional shift of cotton textile industry has taken place between Maharashtra and Tamil Nadu. In the manufacture of basic metals and alloys (33), the eastern region, particularly Bihar, and the central-eastern region, particularly Madhya Pradesh, continue to be the major producers.

In the manufacture of machinery, the western states, particularly Maharashtra, and the southern states, particularly Tamil Nadu and Karnataka, are major producers. Manufacture of food products (20-21) is relatively more dispersed across all the regions in the country (see Table 7).

3. Manufacturing Growth, Investment and Increase in Employment across Indian States

Variation in Growth Rates across Indian States: Wider in the 1990s

Gross value added by India's registered manufacturing or factory sector grew at the rates of 7.3 per cent and 10.8 per cent respectively in the 1980s and 1990s. Variation in growth rates across Indian states was much higher in the 1990s compared to the previous decade (see Figure 8). In the 1990s, Haryana, Gujarat and Andhra Pradesh had the highest growth rates among Indian states; their growth rates were respectively 21 per cent, 16 per cent and 13 per cent. At the same time, during the same decade, Assam and Bihar did not have statistically significant growth. In the 1980s, all Indian states except West Bengal had rates of growth higher than 6 per cent. West Bengal's factory sector grew at a rate of only 1.6 per cent in the 1980s, but at a much faster 7.7 per cent in the 1990s. Assam, on the other hand, had the highest growth rates among Indian states in the 1980s, but no statistically significant growth in the 1990s. The other states that had a fall in growth rates in the 1990s are Bihar, and, to a lesser extent, Orissa and Punjab.

Rates of manufacturing growth in Madhya Pradesh were above the Indian average in the 1980s and 1990s; these rates were very close to but below the Indian average in the case of Maharashtra. Gujarat, Uttar Pradesh, Tamil Nadu and Andhra Pradesh are the other major regions, which had high rates of manufacturing growth in the 1980s and 1990s.

Maharashtra and Gujarat: Major Investment Destinations

In the 1990s, the combined share of the two western states of Maharashtra and Gujarat in the total manufacturing investment in India was as high as 34.6 per cent; higher than the 27.9 per cent these two states together received in the 1980s (see Table 8). Uttar Pradesh, Tamil Nadu, Andhra Pradesh and Karnataka were the other regions to which relatively large shares of manufacturing investment were directed in the 1980s and 1990s. The

states of Jammu and Kashmir, Himachal Pradesh, Assam and Kerala received very low shares of manufacturing investment (see Table 8).

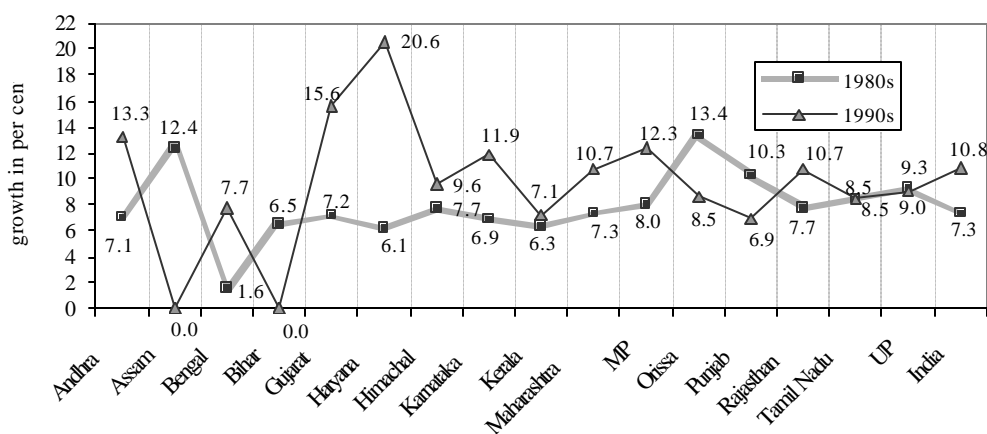
Employment Losses in the 1980s, Employment Gains in the 1990s: State-wise

In the 1980s, major downsizing of manufacturing employment took place in West Bengal, Maharashtra, and, to a lesser extent, in Gujarat, Assam, Kerala and Jammu and Kashmir. 177,000 factory employees lost their jobs in West Bengal and 100,000 employees lost jobs in Maharashtra. Except West Bengal, all the states in which jobs were lost in the 1980s, made up for those losses in the 1990s. Even in West Bengal, 91,000 new jobs were created, although it was not large enough to make up for the loss in the previous decade. However, manufacturing jobs were lost in Bihar and Uttar Pradesh in the 1990s.

High Employment Generation in Andhra Pradesh and Tamil Nadu, Low Employment Generation in Uttar Pradesh

Even in the “jobless decade” of 1980s, considerably large numbers of jobs were created in Tamil Nadu, Punjab, Andhra Pradesh and Madhya Pradesh. Andhra Pradesh and Tamil Nadu, in that order, added the maximum number of new jobs in the 1990s. Approximately 1/3rd of the total number of new jobs generated in the 1980s and 1990s were in these two states combined. On the other hand, Uttar Pradesh, although being a major investment destination in India for the entire period, generated only very few jobs in the 1980s, and, even worse, lost jobs in the 1990s (see Table 8).

Figure 8: Growth of Manufacturing Gross Value Added (at constant 1981-82 prices) across Indian States: Factory Sector, 1980s and 1990s



Notes: 1980s: 1979-80 to 1990-91, 1990s: 1991-92 to 1997-98. All growth rates are calculated using semi-logarithmic regression on three-year moving averages. Growth rates that are not statistically significantly different from zero at 5 per cent level for a two-tailed test are reported as zero in this figure.

Source: ASI Summary Results, Various Issues

Table 8: Increase in Employment and Share of Total Manufacturing Investment across Indian States: Factory sector, 1980s and 1990s

State	Increase in Employment		State	Share in Investment	
	actual numbers '000			per cent	
	1980s	1990s		1980s	1990s
Andhra Pradesh	130	366	Maharashtra	17.6	18.9
Tamil Nadu	172	309	Gujarat	10.3	15.7
Maharashtra	-100	227	Uttar Pradesh	10.6	10.8
Karnataka	46	206	Tamil Nadu	9.3	8.7
Gujarat	-38	197	Andhra Pradesh	10	6.4
West Bengal	-177	91	Karnataka	4	5.9
Kerala	-13	86	West Bengal	6.2	5.9
Haryana	90	61	Madhya Pradesh	7.9	5
Punjab	142	53	Punjab	4.1	3.6
Rajasthan	47	50	Orissa	3.6	3.5
Madhya Pradesh	103	47	Rajasthan	3.8	3.5
Assam	-22	45	Bihar	4.5	3.3
Jammu & Kashmir	-13	29	Haryana	2.8	2.7
Orissa	35	26	Kerala	2	1.8
Himachal Pradesh	31	15	Assam	0.9	1
Uttar Pradesh	78	-21	Himachal Pradesh	0.8	0.7
Bihar	7	-88	Jammu & Kashmir	0.2	0.3
India	484	1763	India	100	100

Notes: 1980s- 1979-80 to 1990-91, 1990s – 1991-92 to 1997-98. Investment is addition to fixed capital stock (at constant 1981-82 prices).

Source: ASI Summary Results, Various Issues

V. CONCLUSIONS

This chapter examined the features of Indian manufacturing in the 1980s and 1990s. The country's industrial policy framework began to be liberalized in the 1980s, and this process gained further momentum in the 1990s. In the two decades under study and particularly in the 1990s, India's manufacturing sector grew at respectably high rates. Growth of registered manufacturing was employment generating in the 1990s compared to the "jobless growth" of the 1980s. However, there are definite signs of a slow down in manufacturing performance after 1995-96. Performance in growth should be seen against the small size of Indian manufacturing – in terms of its share in the country's economy or compared to the manufacturing sectors in other developing economies.

Chemical and related industries increased their relative importance and emerged as the major value adder in India's manufacturing, during the two decades under study. On the other hand, textile and allied industries have lost their shares in total value added; but, along with food industries, they continue to be the major source of factory employment. Growth performance varied greatly across the different industries. Manufacture of chemicals and food products had consistently high rates of value added growth in the 1980s and 1990s; had the

largest numbers of new jobs generated in the 1990s; and also had reasonably large shares of total manufacturing investment moving into them. On the other hand, cotton and jute textiles, each of which had low rates of growth and suffered considerable loss of jobs in the 1980s, continued to grow slow in the 1990s without any significant addition of new jobs.

The fast growth in the manufacture of transport equipment in the 1990s is probably a reflection of the recent boom in demand for passenger vehicles. Large scale of investment has moved into the production of basic metals and alloys like iron, steel, Aluminium, etc. These two industries were the fastest growing segments of Indian manufacturing in the 1990s, after their less than average (for factory sector) growth in the earlier decade. But neither of them could significantly add new jobs. Quite dissimilar was the experience of several labour-intensive industries, particularly the manufacture of textile products and of beverages and tobacco. Their growth rates fell considerably in the 1990s from the impressive performance of the earlier decade. Irrespective of this and of the insignificantly small infusion of new capital into them, these industries were major generators of employment in the 1990s.

The two western states of Maharashtra and Gujarat constitute the leading industrial region in the country; these two states, together, hold a share of more than a third of the total value added in the country. They had high rates of value added growth in the two decades, and had substantially large shares of India's manufacturing investment directed to them. Chemical and related industries in India are heavily concentrated in these two states. The three southern states, Tamil Nadu, Andhra Pradesh and Karnataka, together, comes next in importance in Indian manufacturing. Tamil Nadu and Andhra Pradesh had, among all Indian states, the largest addition in manufacturing jobs in the 1980s and 1990s. During the last two decades, the southern states displaced Maharashtra and Gujarat to become the major centre of India's cotton textile industry. The eastern states, particularly West Bengal and Bihar, have lost their relative importance in Indian manufacturing. Large numbers of manufacturing jobs were lost in West Bengal and Maharashtra in the 1980s; but this was compensated in the 1990s by the creation of new jobs in Maharashtra and, to a lesser extent, in West Bengal. Madhya Pradesh and Uttar Pradesh had reasonably fast rates of value added growth and received large shares of investment during the two decades.

To sum up the growth experience of Indian manufacturing in the liberalizing decades of 1980s and 1990s: respectable rates of growth, but signs of deceleration after 1995-96; employment generating in the factory sector in the 1990s unlike in the previous decade; and significant variation in growth across industries and regions. The continuing deceleration in textile and related industries and the small size of investment moving into them is a

worrisome feature, as these industries continue to be the major sources of manufacturing employment. Also it is doubtful if the fast growing industries in the 1990s - manufacture of food products, chemicals and transport equipment, and particularly the latter two - can sustain their high growth rates, given that the domestic demand for these industries can reach saturation levels faster.

APPENDIX

Two digit industry groups according to National Industrial Classification (NIC) 1987: Codes and description

20-21: Manufacture of Food Products; 22: Manufacture of Beverages, Tobacco and Related Products; 23: Manufacture of Cotton Textiles; 24: Manufacture of Wool, Silk and Man-Made Fibre Textiles; 25: Manufacture of Jute and other Vegetable Fibre Textiles (Except Cotton); 26: Manufacture of Textile Products (including Wearing Apparel); 27: Manufacture of Wood and Wood Products, Furniture and Fixtures; 28: Manufacture of Paper and Paper Products and Printing, Publishing and Allied Industries; 29: Manufacture of Leather and Products of Leather, Fur and Substitutes of Leather; 30: Manufacture of Basic Chemicals and Chemical Products (Except Products of Petroleum and Coal); 31: Manufacture of Rubber, Plastic, Petroleum and Coal products, and Processing of Nuclear Fuels; 32: Manufacture of Non-Metallic Mineral Products; 33: Basic Metals and Alloys Industries; 34: Manufacture of Metal products and Parts, except Machinery and Equipment; 35-36: Manufacture of Machinery and Equipment other than Transport Equipment; 37: Manufacture of Transport Equipment and Parts; 38: Other Manufacturing Industries including Manufacture of Scientific Equipment, Photographic/Cinematographic Equipment and Watches & Clocks; 39: Repair of Capital Goods; 40: Electricity; 41: Gas and Steam Generation and Distribution through Pipes; 42: Water Works and Supply; 43: Non-Conventional Energy Generation and Distribution; 74: Storage and Warehousing Services; 97: Repair Services.

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