Working Paper No. 203

Towards A Competitive Manufacturing Sector

Rajiv Kumar
Abhijit Sen Gupta

February 2008

INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS

Table of Contents

List of Tables

List of Figures

Foreword

It is widely recognized that raising the level of competitiveness in the manufacturing sector is fundamental to sustaining India's high growth regime and to ensure adequate employment opportunities. This study undertakes an evaluation of India's manufacturing sector and identifies the constraints that affect the competitiveness of the sector. The study also analyzes India's chances for becoming a part of global production networks.

The paper assumes importance in the present scenario where manufacturing growth after experiencing one of the longest periods of upswing since 80s and contributing to the robust economic growth in recent years, is beginning to weaken. Sustaining rapid growth of manufacturing and achieving the transition to mass manufacturing requires another major push to the reform agenda, which is outlined in the study.

Rajiv Kumar
Director & Chief Executive

February 20, 2008

Abstract

The Indian manufacturing sector has grown at an impressive average rate of 9.5 per cent annually since 2003-04. Its sustained growth is crucial for generating employment opportunities needed to absorb the rapidly expanding workforce. In this context, this paper reviews the current state of the sector and focuses on determinants of its competitiveness. The paper finds that Indian manufacturing sector exhibits a great deal of regional variation and a marked dualism between the organized and the unorganized segments in terms of both productivity and wage levels. The level of labour absorption in the organized manufacturing sector has been weak as reflected in the declining labour intensity in this sector. This does not augur well for achieving inclusive growth. We also find that although there have been significant changes in the composition of exports in the last 20 years; India is still a very small player at the global level, especially in knowledge intensive and advanced technology products. Finally, the paper explores India's potential for transforming itself into a hub of mass manufacturing. We find that the main constraints in doing so have been the low level of R&D, relative lack of skilled personnel and relatively low FDI levels.

JEL Classification: L60, O11
Keywords: manufacturing, competitiveness, mass manufacturing

Towards A Competitive Manufacturing Sector[#]

1. Introduction[*]

The Indian economy grew at an impressive growth rate of over 8.5 per cent during 2004-05 to 2006-07, primarily on the back of robust growth in the manufacturing and services sector. The manufacturing sector has witnessed remarkable growth rates of over 9 per cent during the last three years reaching up to as high as 12.3 per cent during 2006-07. This is significantly higher than the average annual growth of 5.7 per cent during the previous five years. A sustained double digit growth of the manufacturing sector is essential for achieving the desired GDP growth of 8 to 9 per cent and more importantly to generate the much needed employment.

In this context, the objective of this study is to analyze the growth potential and competitiveness of the Indian manufacturing sector. Section 2 of the paper evaluates the performance of the manufacturing sector over time and makes a cross country comparison. In Section 3, we identify the factors that have contributed to marked divergence in regional development of this sector. Section 4 looks at both the organized and unorganized sectors and examines the factors that have resulted in the marked dualism between these two sectors. Section 5 analyzes the employment generation potential of the manufacturing sector, while Section 6 looks at its export performance. Section 7 identifies the challenges facing Indian manufacturing sector to make the transition to mass manufacturing, and discusses possible means to address these challenges or constraints. Finally, Section 8 summarizes the main conclusions of the paper.

2. Aggregate Manufacturing Scenario

The Indian manufacturing sector experienced a strong resurgence in the last three years. It witnessed an average annual growth rate of around 10.13 per cent in 2004-07, compared to 5.7 per cent during the preceding five years. Buoyed by this impressive growth in the manufacturing sector, the Indian economy grew at an average annual rate of 8.6 per cent in 2004-07 compared to just 5.4 per cent during 2000-04.

Given, India's stage of development, manufacturing would be considered to be the engine of development. However, this is apparently not happening as the growth has been primarily driven by services. In fact, Kochhar *et. al.* (2005) point out that the change in the share of manufacturing in GDP in India between 1980 and 2000 has

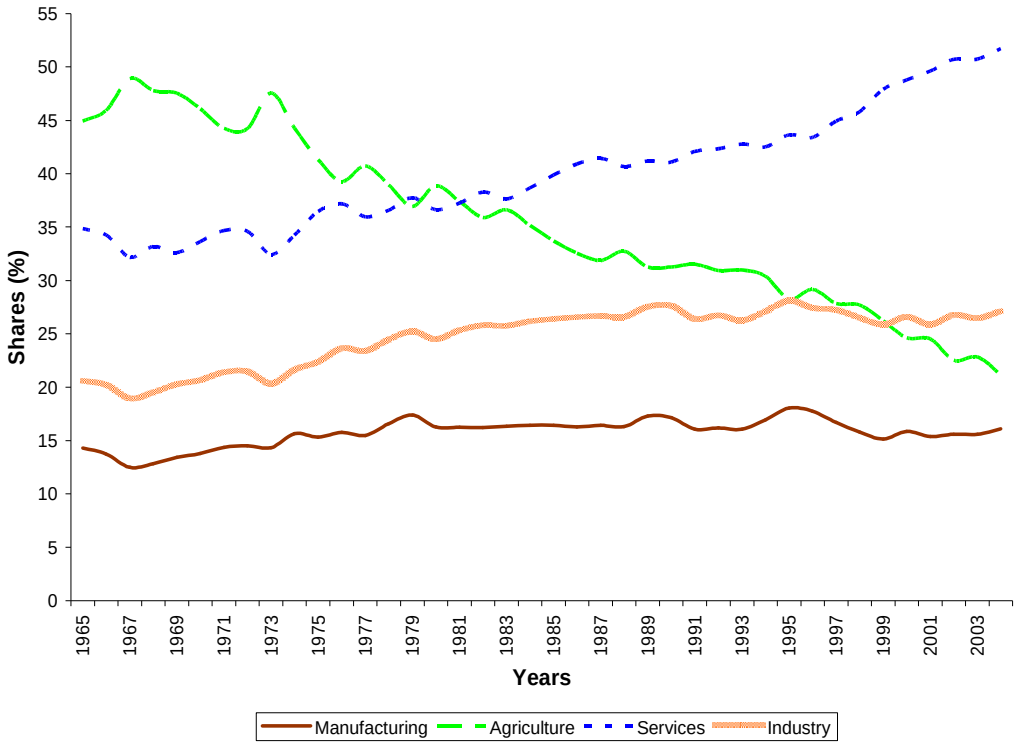
[#] **Rajiv Kumar**, Director and Chief Executive, Indian Council for Research on International Economic Relations. Email: rkumar@icrier.res.in;
Abhijit Sen Gupta, Fellow, Indian Council for Research on International Economic Relations. Email: abhijit@icrier.res.in

[*] The authors would like to thank Deb Kusum Das, Bibek Debroy, Badri Narayanan, Deepika Wadhwa, Rajeev Anantaram and conference participants at ICRIER's Silver Jubilee Conference on India and the Global Economy and Eighth NCAER-NBER Neemrana Conference for their very helpful comments. We would also like to thank Karan Singh and Gaurav Tripathi for excellent research assistance. All remaining errors and omissions are ours.

been 2.5 percentage points lower than the average country at the same stage of development, while the change in service share was 10 percentage points higher than average.

Over time, it can be seen (Figure 1) that the share of value added by the manufacturing sector in India's GDP has been stagnant. From 1965 to 2004 the decline in agriculture's share was nearly matched by the increase in service's share. However, the share of industry increased from 21 per cent to 27 per cent but the increase in manufacturing sector's share was only from 14 per cent to just over 16 per cent, over a period of 40 years. Surprisingly, the share of manufacturing sector has declined since 1995 when it peaked at just over 18 per cent. It declined to 15 per cent in 1999, before settling around 16 per cent in recent years. The contribution of the other components of industry, namely, mining, construction, electricity, water and gas, has increased steadily from 6 per cent to 11 per cent.

Figure 1: Change in Sector Shares (1965-2004)



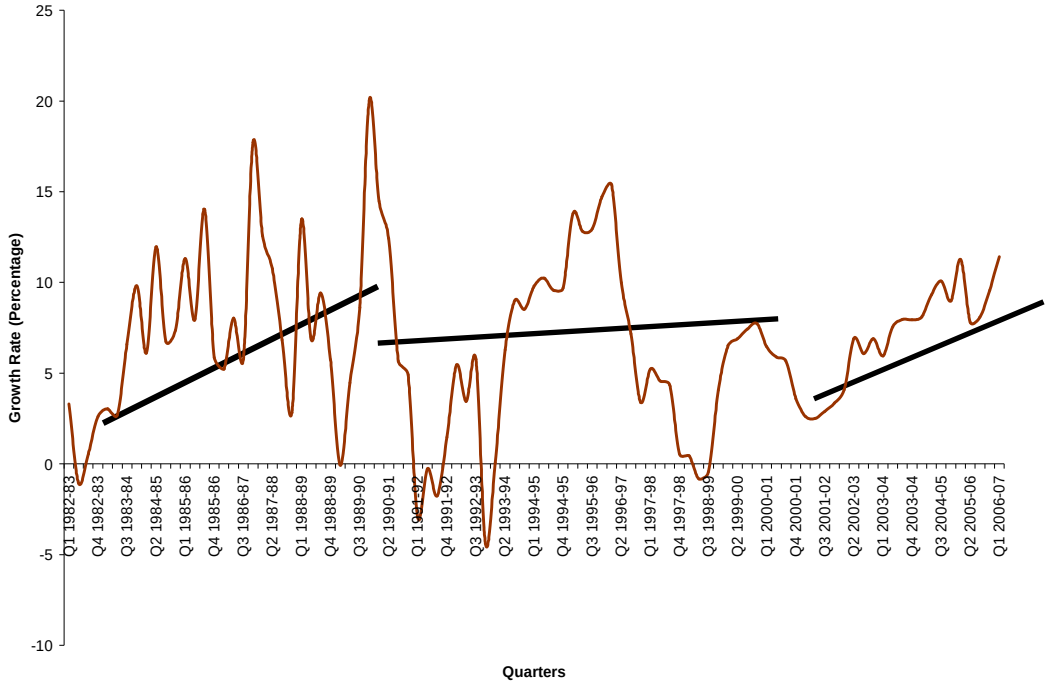
Source: World Development Indicators 2006

A cross-country comparison shows that contribution to GDP by the manufacturing sector in India is much lower compared to other developing countries. While in China, the manufacturing sector accounts for nearly 35 per cent of the GDP, in South Korea, Malaysia and Indonesia, the share of manufacturing sector is around 30 per cent. Even in Latin American economies like Argentina and Brazil, the manufacturing sector contributes around 24 per cent to GDP. It is important to examine the reasons

that have constrained the growth of the manufacturing sector in India and resulted in a stagnation of its share in GDP.

Manufacturing sector growth has been cyclical with downswings being notably shorter than upswings. Figure 2 plots the quarter to quarter growth rate of the manufacturing sector from the first quarter of 1982-83 to the first quarter of 2006-07.

Figure 2: Performance of the Manufacturing Sector



Source: Central Statistical Organization

The sector witnessed strongest growth during the 1980s when the annual rates of growth for manufacturing, registered manufacturing and unregistered manufacturing were 7.0, 8.1 and 5.8 per cent respectively. The reorientation of industrial and trade policies in the mid-1970s was reinforced in the 1980s with the introduction of major policy reforms. Nagraj (1990) and Ahluwalia (1991) have provided several explanations for the improved growth performance in 1980s. These range from increase in infrastructure investment and better management of these sectors, growth of per capita income to widespread reforms in industrial and trade policies. The policy reforms and infrastructure investment resulted in significant improvements in total factor productivity.[1]

[1] The industrial and trade reforms undertaken during the 1980s had a positive impact on the performance of the manufacturing sector. Access to imported capital goods was vastly increased by the reform of the Open General Licensing (OGL) and canalized import schemes. The OGL list identified items that could be imported without a licence from the Ministry of Commerce and was steadily expanded over this decade. Intermediate inputs were also placed on this list and their numbers steadily improved over the decade. This was accompanied by a strong decline in the share of canalized imports. As a result, the share of imports that were neither canalized not subject to licensing increased from 5 per cent in 1980-81 to 30 per cent in 1987-88. Consequently, firms could import machinery or raw material at cheaper costs, which contributed significantly to the productivity.

The 1980s also witnessed significant relaxation of industrial controls. In 1985, 25 industries were delicensed and the number had reached to 31 by 1990. The limit on requirement of an industrial licence was raised from Rs. 3.5 crore to Rs. 50 crores in backward areas and Rs. 15 crores elsewhere. In many industries, broad banding was introduced, which allowed firms to switch production between similar items, and expand capacity by 25 per cent without applying for a licence. The asset limit, over which firms were subject to Monopolies and Restrictive Trade Practices (MRTP) Act regulations, was raised from Rs. 20 crores to Rs. 100 crores. This freed half of the 180 large business houses from restrictions on growth in established product lines. For several industries, the requirement of MRTP clearances was completely waived off. Price controls on cement and aluminium were abolished. This eliminated the prevailing black market and the resulting expanded production led to substantial reduction in prices.

Finally, this period also witnessed introduction of several export incentives, which reduced the foreign exchange constraints faced by the firms and allowed them to import machinery and raw material. Replenishment (REP) licences were given to exporters to import goods on the restricted list and these were made freely tradable in the market. Kelkar and Kumar (1990) argue that as a result of these reforms, the manufacturing sector at the end of the 1980s looked significantly different from the end of the 1970s.

The reform process was more aggressively pursued during the 1990s. There was a change from a "positive list," where only items on Open General License (OGL) did not require a licence for import, to a "negative list," where an item could be imported unless it was explicitly on the restricted list. The New Industrial Policy (NIP) of 1991, removed investment licensing and entry restrictions on MRTP firms, reduced public sector monopoly and abolished industrial licensing for all firms, except those specified on health, safety, security and environmental grounds. In the area of foreign investment, the Reserve Bank of India was empowered to approve equity investment up to 51 per cent in almost all industries except those subject to public sector monopoly and industrial licensing. There was also some reduction in the number of products reserved for the small sector.

Import licensing was abolished on almost all intermediate and capital goods. However, restrictions on consumer goods imports continued to remain in place. Tariff rates on several products were raised in the 1980s to convert quota rents into tariff revenue. Since 1991 these tariff rates have been lowered by compressing the top tariff rate and rationalizing the tariff structure. The rupee was devalued by 22 per cent in 1991 to reflect its correct value and as a result, Indian exports become more competitive in global markets.

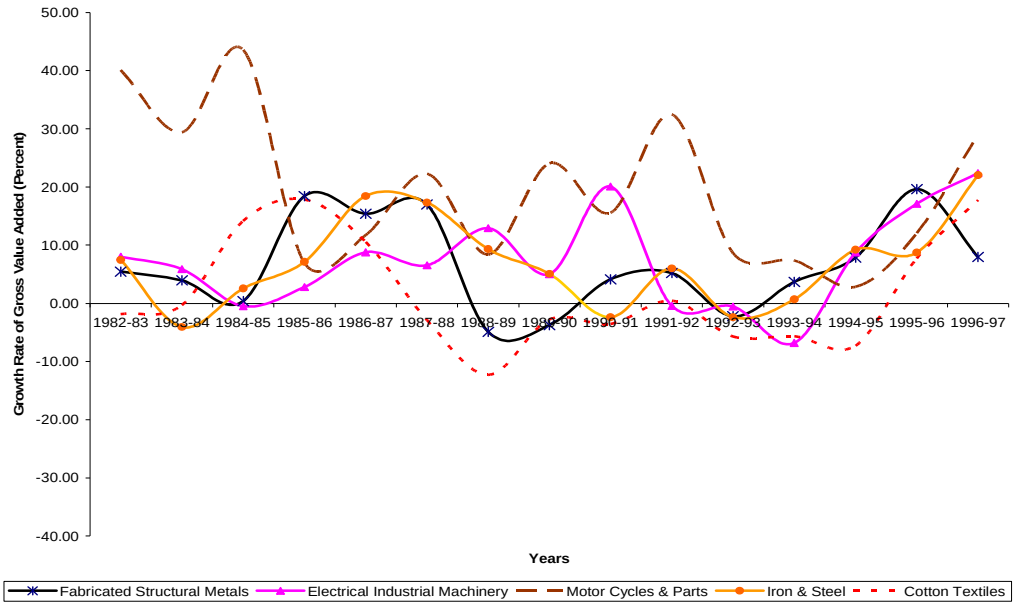
To analyze the impact of trade and industry reforms on the manufacturing sector performance, we look at the performance of some of the sectors that underwent significant liberalization during the 1980s. We identify products where the effective rate of protection was significantly reduced compared to 1980-85 and automatic approval of foreign direct investment up to 51 per cent was allowed under the NIP 1991. Das (2002) shows that during 1985-90, compared to the period 1980-85, effective rate of protection fell significantly in fabricated structural metals (26.56 per cent), electrical industrial machinery (22.71 per cent), motor cycle and parts (21.74

per cent) and iron and steel (13.41 per cent). In these products automatic approval of FDI was also allowed up to 51 per cent. On the other hand cotton textiles witnessed an increase in the effective rate of protection of about 14.22 per cent. It was also one of the sectors where automatic approval of FDI was not allowed.

Figure 3 shows that sectors which witnessed a substantial decline in the effective rates of protection and got access to FDI, performed relatively better compared to sectors where the rate of protection was increased. Sectors which were opened up to foreign markets and competition like fabricated structural metals, electrical industrial machinery, motor cycle and parts and iron and steel experienced average annual growth rates of 5.21 per cent, 7.45 per cent, 15.76 per cent and 7.06 per cent respectively. On the other hand, cotton textiles, a closely protected sector, grew at a meagre 1.44 per cent during 1980-81 to 1997-98. Thus, liberalization had a positive impact on sectoral growth rate by giving them access to better technology and ensuring more efficient use of resources.

However, manufacturing growth witnessed a slowdown beginning from 1998. Several reasons have been attributed for the slowdown. Export growth fell during this period due to erosion of India's competitiveness on account of steep depreciation of the

Figure 3: Performance of Selected Sectors during 1980s and 1990s



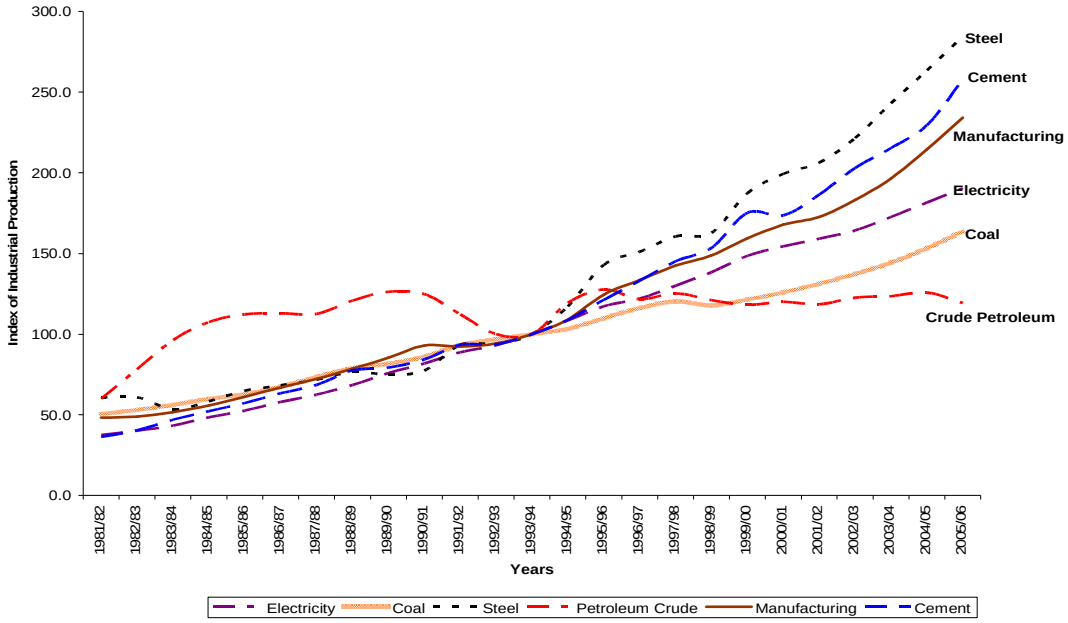
Source: Central Statistical Organization

East Asian currencies. Moreover, rural demand declined due to low agricultural output and slow take off of some key infrastructure projects. Desai (2001) argued that the credit squeeze in 1996 and high interest rates stifled manufacturing growth. Nagraj (2003) contends that the slowdown could be attributed to low agriculture growth and reduction in public investment. After a brief turnaround in 1999-2000, the manufacturing growth again slowed down in 2000-01. The main reasons for deceleration were low domestic and external demand, high real interest rates and infrastructure bottlenecks.

The growth rate in the manufacturing sector has picked up strongly since the last quarter of 2001-02. Since then the manufacturing sector has witnessed the longest ever upswing since the 1990s. From the last quarter of 2001-02, the manufacturing sector witnessed an impressive average growth rate of over 8.4 per cent. Some of the previously existing deficiencies were rectified in this period and more significantly, capital became cheaper since 2001, which facilitated restructuring of the existing infrastructure. Moreover, tariff and delicensing reforms of the early 90s increased competition and raised growth expectations. As a result capacity was added in anticipation of forthcoming demand. However, the additional demand did not materialize. This led to the downturn of the manufacturing sector in the late 1990s. The period was used to raise productivity, shed labour, introduce quality controls and other modern methods like JIT and TQM. As a result of these the Indian manufacturing sector became globally competitive. The industry also came to understand that domestic market was no longer isolated from global markets so it was better to adopt globally competitive strategies. Along with these, improved transport connectivity and impressive export performance ensured that the payoffs were realized since early 2001.

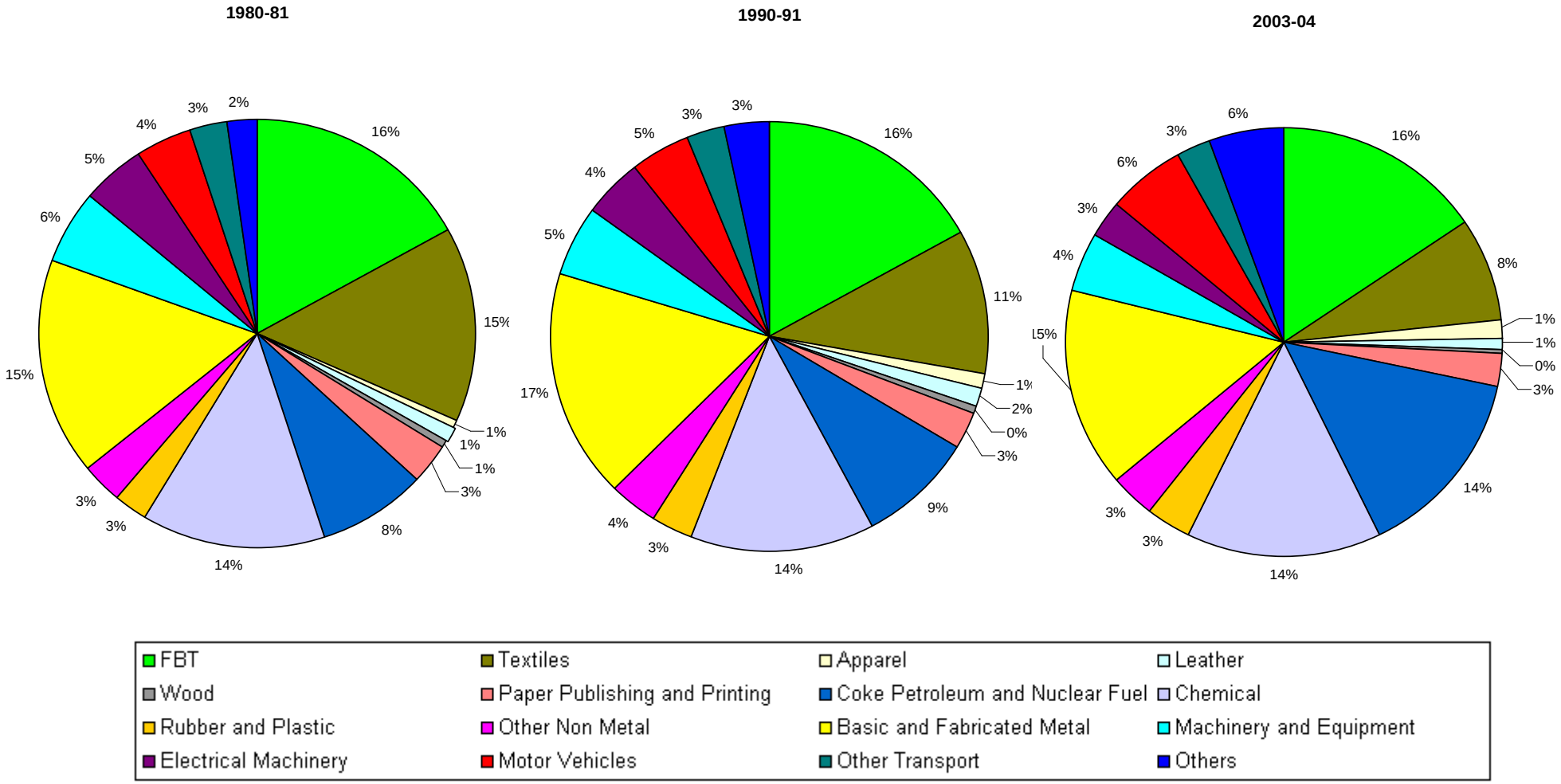
In fact the manufacturing sector has performed significantly better than several of the core infrastructure sectors. Comparing the manufacturing sector with other core sectors, namely, coal, cement, steel, electricity and crude petroleum, we find that the manufacturing sector has grown faster than electricity, coal and crude petroleum, while steel and cement sectors have grown faster than the manufacturing sector. The slow growing sectors, namely, electricity, coal and crude petroleum are primarily owned by the public sector. On the other hand in manufacturing, cement and steel, the private sector has a dominant presence. Thus we find that the ownership of the sectors is related to the performance of the sectors, with privately owned sectors performing better than publicly owned ones. This divergent performance of manufacturing and core or intermediate sectors could impose binding constraints on future growth.

Figure 4: Comparison of the Manufacturing Sector with Core Industries



Source: Central Statistical Organization

Figure 5: Change in Composition of the Manufacturing Output (1980-81 to 2003-04)

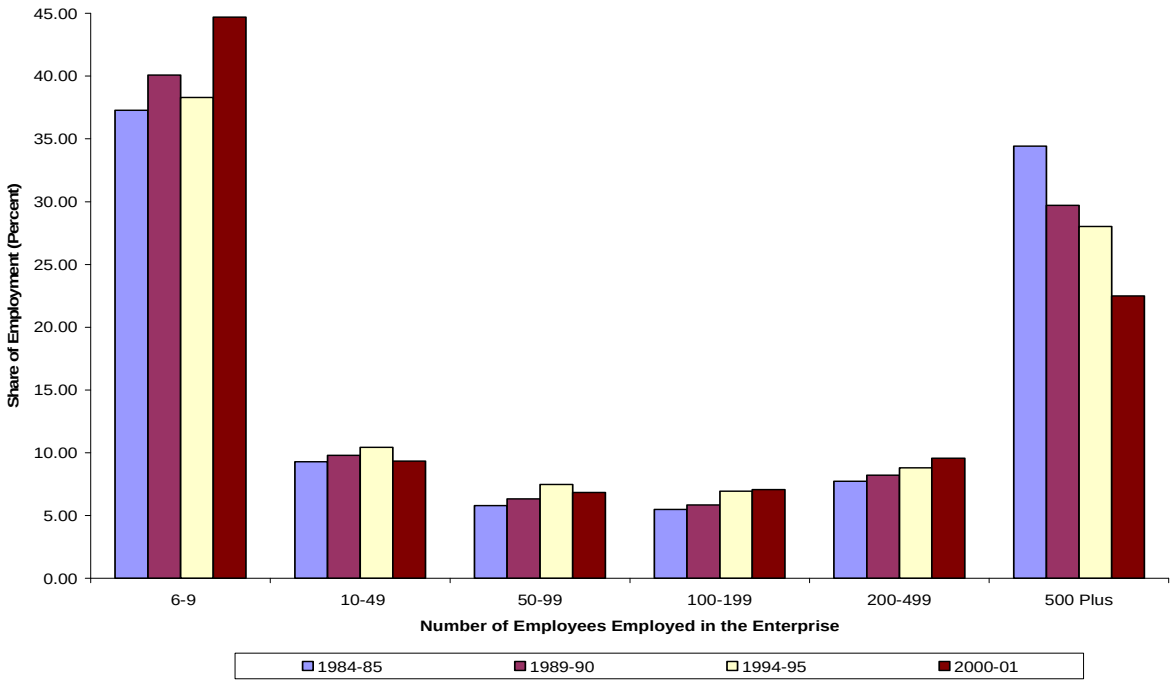


Source: Annual Survey of India, Various Issues

The sub-sector composition of the manufacturing output has hardly changed between 1980-81 to 2003-04. Food beverages and tobacco, which constitute the largest component, has maintained its share at 16 per cent of manufacturing output. The share of basic and fabricated metal stood at 15 per cent in 1980-81. It went up marginally to 17 per cent in early 1990s but was back at the original level in 2003-04. Chemicals and related products also maintained their share at 14 per cent over this period. Sectors whose share increased were coke, petroleum and nuclear fuel, whose share rose from 8 per cent in 1980-81 to over 14 per cent in 2003-04, and motor vehicles, which had a share of 6 per cent in 2003-04. Textile has been the biggest loser with its share declining from 15 to 8 per cent during the same period (Figure 5).

The Indian manufacturing sector is typified by an extremely skewed employment structure. Tybout (2000) points out that such an employment structure is common to several developing countries but the situation in India is rather extreme. As is evident from Figure 6, in India, an exceptionally large number of workers are engaged in the smallest size group of 6-9 workers.[2] At the other extreme there is a fairly high proportion of large establishments that employ more than 500 workers. Consequently, as pointed out by Mazumdar (1998), the manufacturing sector in India is characterized by "missing middle" that is, a very small proportion of the workers being employed in medium scale establishments, employing between 50 and 500 workers. This skewed structure has implications for both efficiency as well as equity.

Figure 6: Distribution of Enterprises on the Basis of Employment



National Sample Survey Organization and Annual Survey of Industries, Various Reports

[2] These are workers engaged in Directory Manufacturing Establishment (DME) which employs more than six workers but less than nine.

Apart from the existence of such a skewed structure, what is more worrying in the Indian context is that such a structure has remained in place over the last 16 years. While in 1984-85, 37 per cent of the manufacturing workforce was engaged in establishments employing 6-9 workers, the number increased to around 45 per cent in 2000-01 after declining briefly in mid-1990s. At the other end of the spectrum, the share of establishments employing more than 500 workers decreased from 34 per cent to 22 per cent during the same period. Thus at one end we have establishments that are characterized by extremely low levels of productivity, while at the other end there are large firms that are able to compete globally. As a result of this skewed structure, the share of establishments employing between 50 and 500 workers have remained more or less constant during this period. In 1984-85 such firms employed around 19 per cent of the manufacturing workforce, while in 2000-01 their share increased only marginally to 23.5 per cent. Thus there is a dearth of middle sized firms, which are often the main employment generators in the manufacturing sector, while producing reasonably high quality goods. In other rapidly growing Asian economies like China, South Korea, Hong Kong and Taiwan the employment structure is far more evenly distributed.

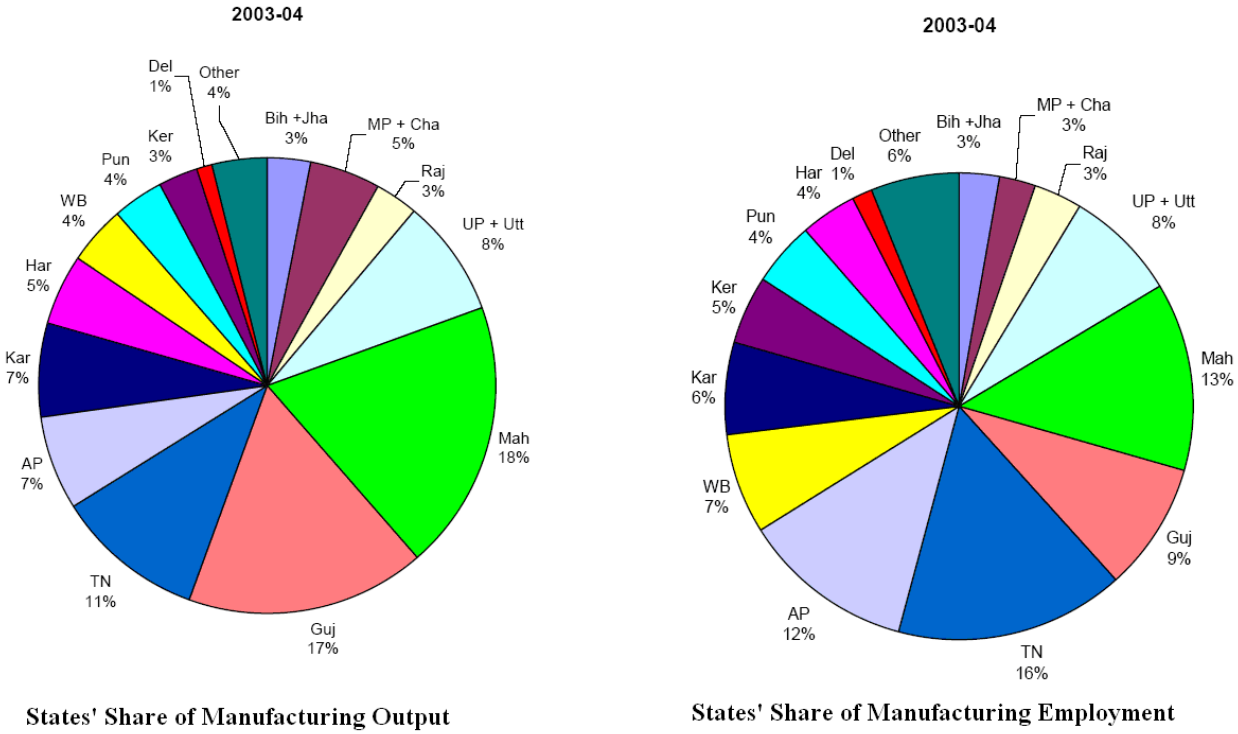
This dualistic structure of Indian manufacturing is a consequence primarily of two sets of government policies, namely, the small scale industry (SSI) promotion and labour market policies. The SSI policies are characterized by fiscal incentives, subsidized credit, input subsidies and above all the reservation of a large number of sectors exclusively for SSI units. This policy regime has effectively encouraged small units to remain small. By remaining small they achieved higher profitability, and apparently in a range of industries the policy incentives outweighed the returns that could be achieved by larger size and economies of scale. This incentive to remain small has been greatly reinforced by the plethora of labour market policies that in effect sharply raise labour costs above a fairly low threshold. The strongest disincentive against scaling upwards arises from the uncertainty created by the combination of labour policies and non-transparent set of complex government processes. These have resulted in a very high rate of attrition and an unsupportive investment environment. The rewards for breaking these barriers against size are very large. But only a very few could achieve the breakthrough. This nexus of two long-standing 'pro-socialist' policies perhaps best explain the missing middle or the dualistic structure of Indian manufacturing sector.

3 Regional Disparities

The manufacturing sector has not developed uniformly across India. Some states have achieved high level of industrialization, where as others are lagging far behind. Moreover, there is also a significant difference between the share of states in total manufacturing output and its share in number of workers (Figure 7).[3]

[3] These shares have been calculated using the data provided by Annual Survey of Industries and hence is an indication of the organized sector only.

Figure 7: State-wise Decomposition of Output and Workforce



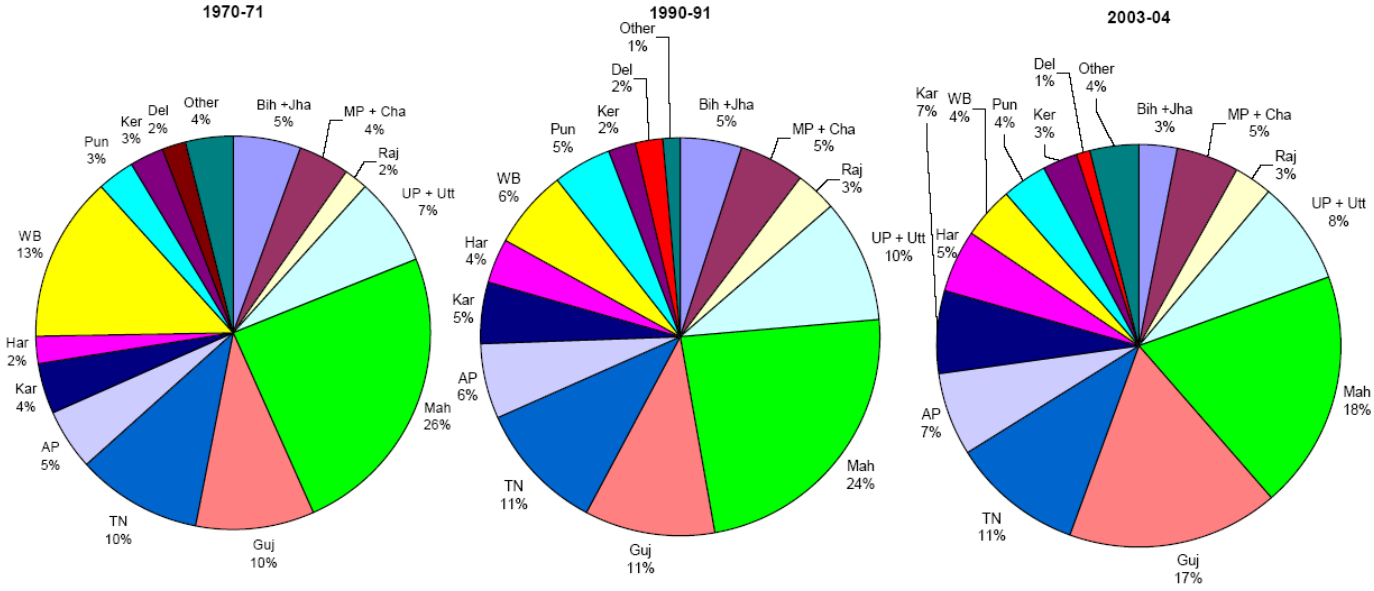
Source: Annual Survey of Industries 2003-04

Maharashtra, which is the leading contributor to manufacturing output at 18 per cent, accounts for only 13 per cent of the workforce. Similarly, Gujarat employs only 9 per cent of the workforce but produces 17 per cent of the manufacturing output. On the other hand states like Tamil Nadu, Andhra Pradesh and West Bengal together employ as much as 35 per cent of the manufacturing workforce but contribute only 22 per cent of the output.

In Maharashtra, four industry divisions produced more than 50 per cent of the manufacturing output. These were (i) chemical and chemical products (15.67 per cent), (ii) coke, refined petroleum products and nuclear fuel (14.09 per cent), (iii) food and beverages (11.66 per cent) and (iv) basic metals (10.39 per cent). In Gujarat, these four sectors accounted for nearly 75 per cent of the manufacturing output. The shares of these sectors were 27.31 per cent, 33.00 per cent, 8.45 per cent and 6.22 per cent. According to Burange (1999), barring food and beverages, all the other above sectors are classified as capital intensive industries. This explains how Maharashtra and Gujarat have been able to contribute more to the manufacturing output than their employment share. Figure 8 looks at the state-wise decomposition of output at three different points 1970-71, 1990-91 and 2003-04 and shows that states' shares have not remained constant over this period of time. Maharashtra and Gujarat have been front runner over this entire period.

The more robust growth of manufacturing in Maharashtra and Gujarat is a consequence of pro-active and supportive policy regimes.[4] On the other hand several states' shares have declined dramatically like West Bengal, whose share declined from 13 per cent in 1970-71 to 4 per cent in 2003-04. Thus West Bengal seems to have experienced a severe de-industrialization during this period. Lahiri and Yi (2005) find that productivity differences – attributable to both total factor productivity and human capital – account for 75 per cent of the difference between manufacturing sector performance in Maharashtra and West Bengal. The other major difference is likely to be due to labour market problems in West Bengal. During the last three decades West Bengal has witnessed a significant rise in the bargaining power of the trade unions. This induced more aggressive trade union demands for higher wages and more labour friendly work rules. According to the Labour Bureau, in 2005, out of the total loss of 23.27 million mandays in the country, West Bengal alone accounted for 13.99 million mandays or 60.15 per cent.

Figure 8: State-wise Decomposition of Manufacturing Output



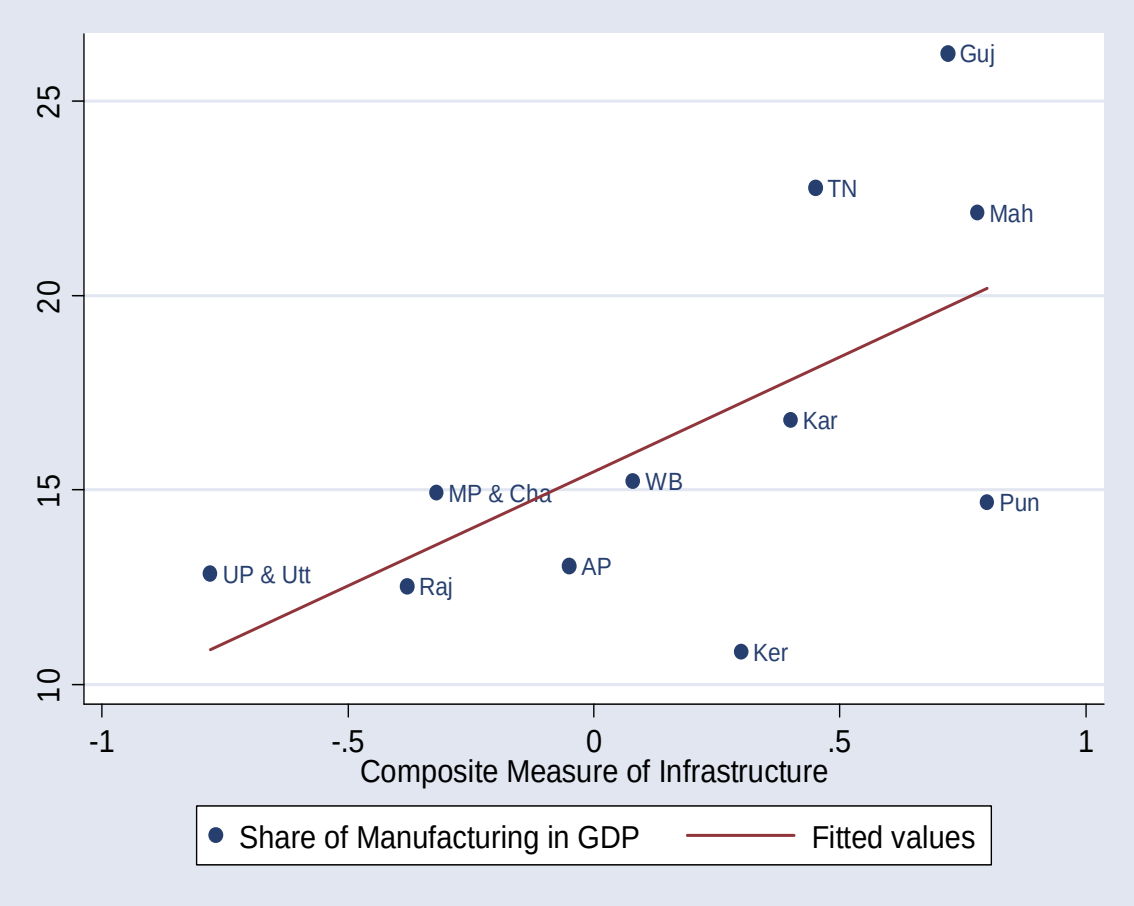
Source: Annual Survey of Industries, Various Issues

Others, which have witnessed a decline in their shares, are the BIMARU (Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh) states. In 1990-91, these states accounted for more than 23 per cent of the manufactured output. However, in 2003-04, their contribution fell to 19 per cent. The decline in their share seems to be due to the poor condition of infrastructure. Manufacturing is heavily dependent on several key infrastructures like power, telecom, ports, roads, railways, urban infrastructure, finance,

[4] Both Maharashtra and Gujarat have provided several fiscal incentives to promote the growth of manufacturing sector. They have also emphasised on setting up of Industrial parks, upgradation of infrastructure, R&D, enhancing exports, etc. with a view to increase the output of the manufacturing sector.

etc. Mitra *et. al.* (2002) construct a composite infrastructure indicator using principal component analysis. The variables that go into the construction of the indicator include electricity availability, density of road and rail networks, number of vehicles, development of postal system, school enrolment rate, infant mortality rate and financial depth of the states. Figure 9 looks at the relationship between this infrastructure indicator and performance of the manufacturing sector and shows that there are strong disparities across states, with Maharashtra, Gujarat, Punjab and Tamil Nadu being best

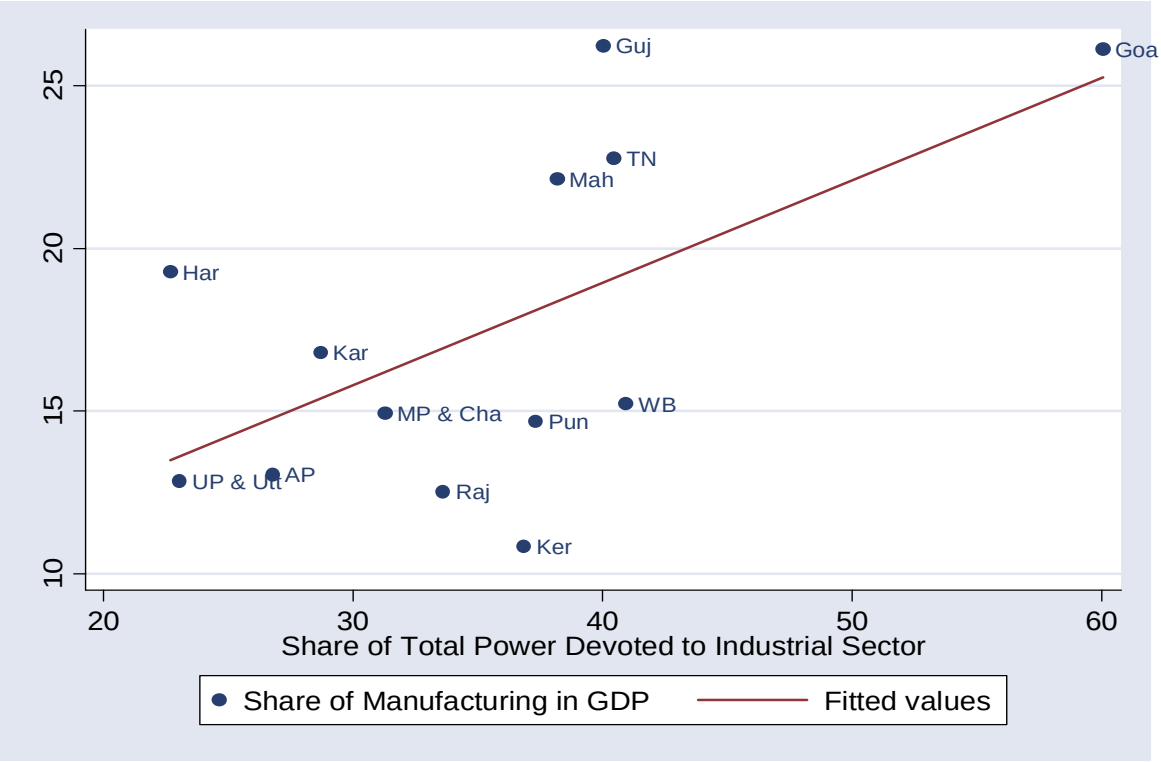
Figure 9: Significance of Infrastructure for Manufacturing Sector



Source: Mitra et. al. (2002) and State Domestic Product, CSO, Various Issues

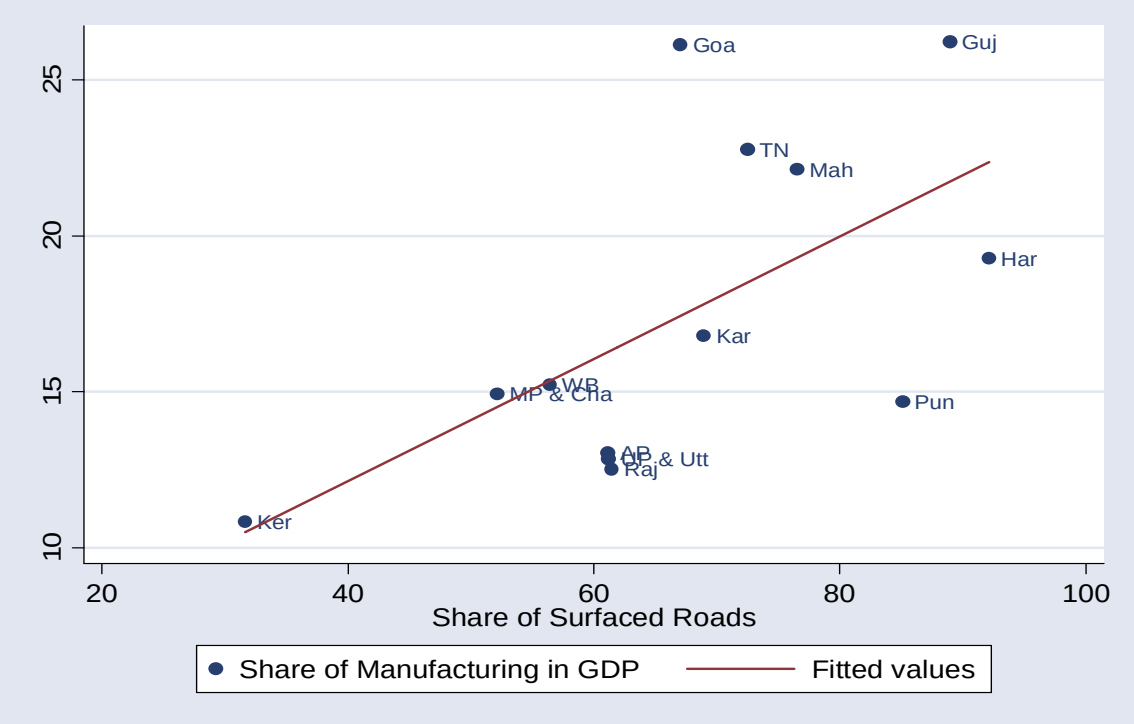
equipped in terms of infrastructure. Barring Punjab, these are also the states in which the manufacturing sector contributes significantly to the states' GDP. Figures 10 and 11 show the relationship between manufacturing share and state of power availability and the state of the roads. It is clear that states with better availability of infrastructure have seen a higher growth of manufacturing. Similarly, Figure 12 shows that states with greater supply of skills have attracted more industrial investment.

Figure 10: Significance of Power for Manufacturing Sector



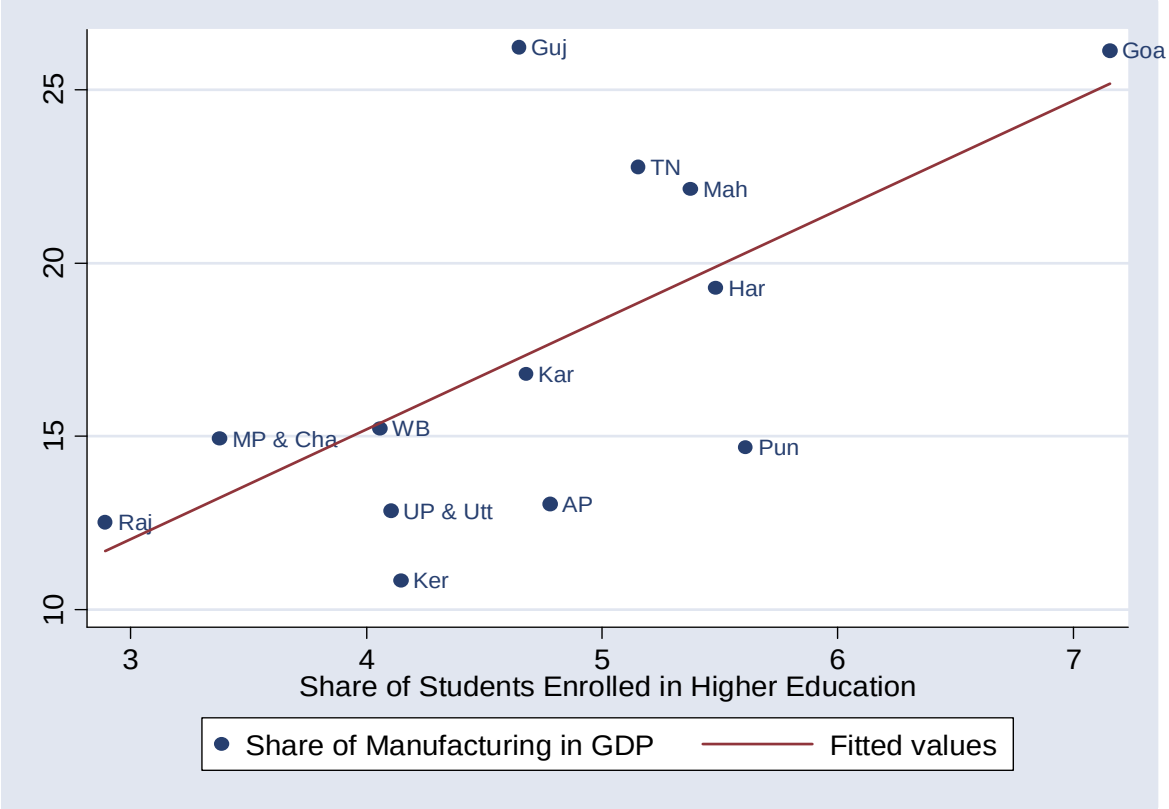
Source: Statistical Abstract of India and State Domestic Product, CSO, Various Issues

Figure 11: Significance of Roads for Manufacturing Sector



Source: Statistical Abstract of India and State Domestic Product, CSO, Various Issues

Figure 12: Significance of Higher Education for Manufacturing Sector



Source: Statistical Abstract of India and State Domestic Product, CSO, Various Issues

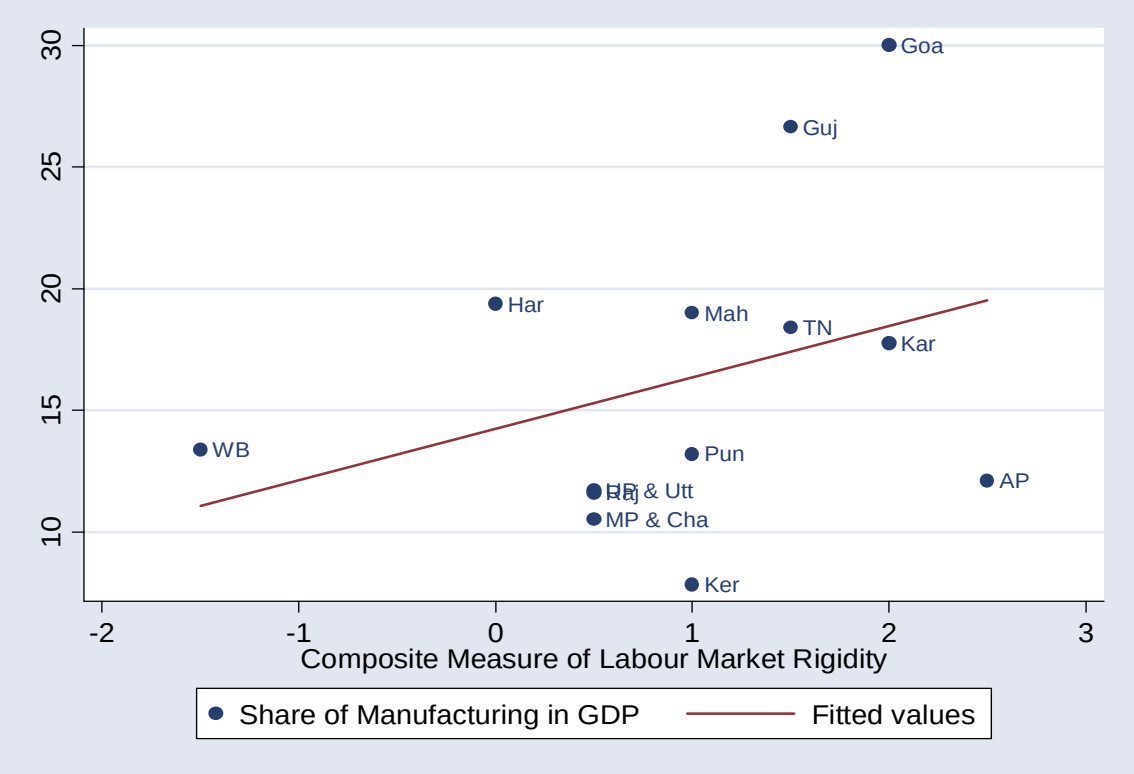
The nature of the existing labour market also plays a significant role in attracting entrepreneurs into a state and thereby influences the share of manufacturing sector in the states' GDP. To capture the variation in inter-state labour laws we start with Besley and Burgess (2004) coding of state amendments to the Industrial Dispute Act (IDA).[5] We change the signs of the numbers in Besley and Burgess (2004) so that a higher number implies more flexible labour conditions. However, an often pointed out problem with this coding is that Maharashtra and Gujarat, two of India's most industrialized states, are characterized as having inflexible labour markets, as they passed pro-employee amendments to IDA. It is highly questionable that businesses would consider setting up manufacturing firms in these states if they found the labour market to be quite rigid.

To overcome this problem we supplement the data in Besley and Burgess (2004) with World Bank (2003), which looks at a firm level survey of managers. According to World Bank (2003), Maharashtra and Gujarat are categorized as having "Best Investment Climate." We quantify the responses of the managers in this study and then take a weighted average of this measure and the measure used in Besley and Burgess

[5] Besley and Burgess (2004) consider state level amendments to IDA. They code the amendments as 1, -1 or 0 depending on whether theses amendments were pro-employee, anti-employee or neutral. The scores are then accumulated over the years. The numbers range from 4 for West Bengal to -2 for Andhra Pradesh and Tamil Nadu

(2004) to arrive at a composite measure of labour market rigidity.[6] The index goes from -2 to 2.5 and a higher number indicates greater labour market flexibility. In Figure 13 we look at the relationship between labour market rigidity and share of manufacturing in GDP.

Figure 13: Significance of Labour Market Flexibility for Manufacturing Sector



Source: Authors' Calculations and State Domestic Product, CSO, Various Issues

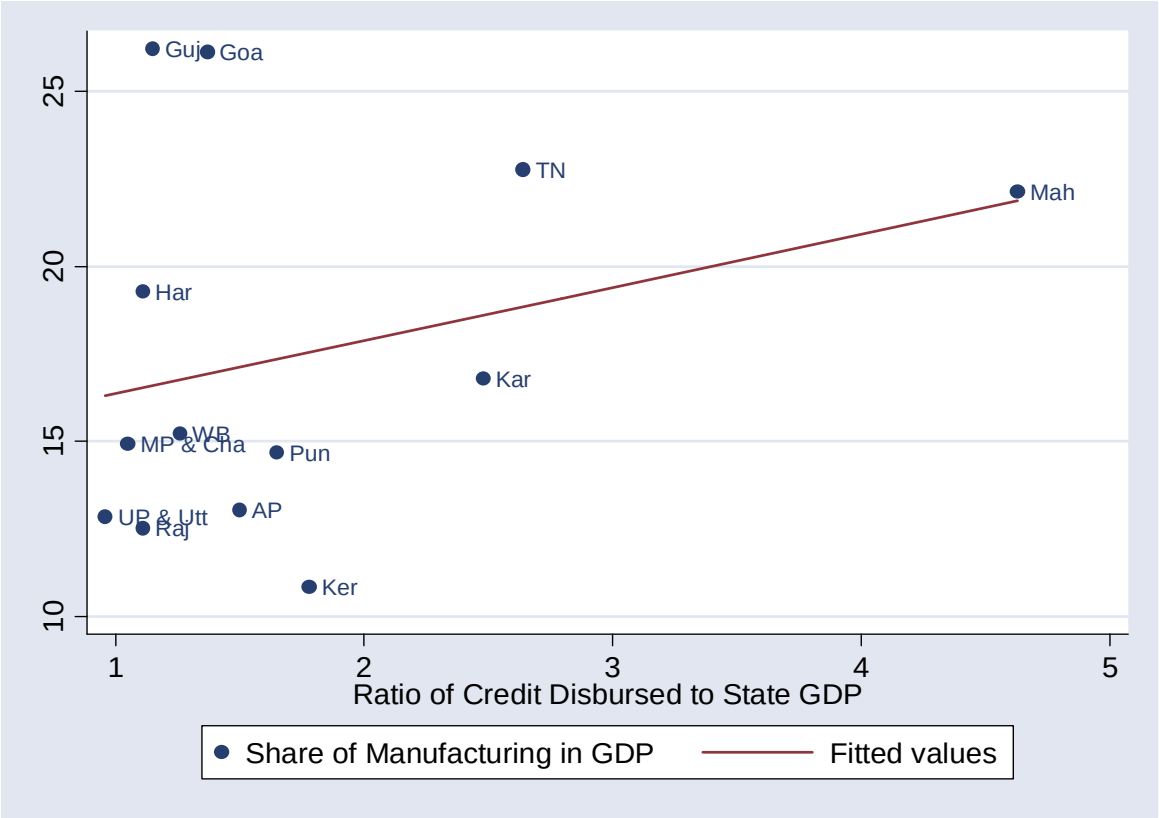
It is evident that states which have greater labour market flexibility like Goa, Gujarat, Tamil Nadu and Maharashtra are the ones where manufacturing sector is accounting for 20 per cent of the GDP or more. Rigid labour laws are a big deterrent for setting up new enterprises and the entrepreneurs, wary of the fact that they will be unable to offload workers, do not hire them in the first place.

The performance of the manufacturing sector is also affected by the ease of access to finance. Burgess and Pande (2005) investigate the effect of rural branch expansion of banks across 16 Indian states and conclude that states with more rapid branch expansion into unbanked areas witnessed greater increase of per capita output in the unregistered manufacturing sector. While the above paper focuses on the financial density, we look at the impact of financial depth on the performance of the manufacturing sector. We measure financial depth with the ratio of credit disbursed to GDP. We find that states where this ratio is high are the ones where manufacturing sector plays an important role. States like Maharashtra and Tamil Nadu, which exhibit relatively good financial depth, are the ones with a strong manufacturing sector. On the other hand, in Gujarat and Goa,

[6] World Bank (2003) categorizes the investment climate as poor, medium, good and best. We quantified these responses by assigning 1 to poor, 2 to medium, 3 to good and 4 to best.

the manufacturing sector is strong despite lower degree of financial depth. Finally, states like Uttar Pradesh (including Uttarakhand), Rajasthan and Madhya Pradesh (including Chattisgarh) are characterized by extremely low financial depth and consequently a weak manufacturing sector.

Figure 14: Significance of Financial Depth for Manufacturing Sector



Source: Reserve Bank of India and State Domestic Product, CSO, Various Issues

These results have strong policy implications for state governments. It is clear that states like Goa, Gujarat, Maharashtra and Tamil Nadu, which have undertaken substantial infrastructural reforms, and have relatively high financial depth in some cases, boast of a manufacturing sector, whose contribution to GDP is in excess of 20 per cent. Moreover, these are also states that have undertaken steps to ensure greater labour market flexibility and as a result have attracted both domestic and foreign investors.

4 Unorganized and Organized Manufacturing Sector

The Indian manufacturing sector is broadly divided into two segments, organized and unorganized. The organized sector includes all units that are registered under Factory Act 1948, 2 m(i) and 2 m(ii). Other units fall under unorganized manufacturing. Table 1 below compares some of the key characteristics of the two sectors in 2000-01.

Table 1: Shares of Unorganized and Organized Sector (2000-01)

(in percent)

	Units		Workers		Fixed Capital		Outstanding Loan		Wages		Output		Gross Value Added	
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)
	Unorg	**Org**	**Unorg**	**Org**	**Unorg**	**Org**	**Unorg**	**Org**	**Unorg**	**Org**	**Unorg**	**Org**	**Unorg**	**Org**
Food Products and Beverages	99.21	0.79	87.03	12.97	37.74	62.26	5.62	94.38	22.55	77.45	22.98	77.02	35.15	64.85
Tobacco	99.87	0.13	88.24	11.76	58.04	41.96	8.68	91.32	14.24	85.76	26.00	74.00	37.76	62.24
Textiles	99.44	0.56	84.95	15.05	23.07	76.93	3.71	96.29	31.47	68.53	20.25	79.75	35.53	64.47
Wearing Apparel; Dressing and Dyeing of Fur	99.88	0.12	94.18	5.82	82.42	17.58	17.33	82.67	60.15	39.85	44.77	55.23	67.69	32.31
Leather and Leather Products	98.76	1.24	77.71	22.29	43.66	56.34	4.46	95.54	33.33	66.67	22.59	77.41	37.73	62.27
Wood and Wood Products	99.88	0.12	99.29	0.71	90.53	9.47	40.03	59.97	82.93	17.07	83.75	16.25	92.55	7.45
Paper and Paper Products	96.40	3.60	64.32	35.68	9.40	90.60	2.04	97.96	14.80	85.20	11.72	88.28	15.35	84.65
Publishing, Printing and Reproduction of Recorded Media	97.75	2.25	86.64	13.36	56.45	43.55	21.03	78.97	37.45	62.55	30.13	69.87	35.93	64.07
Coke, Refined Petroleum Products and Nuclear Fuel	89.09	10.91	31.88	68.12	0.48	99.52	0.06	99.94	1.32	98.68	0.49	99.51	0.81	99.19
Chemical and Chemical Products	95.51	4.49	51.10	48.90	2.31	97.69	1.58	98.42	4.83	95.17	2.94	97.06	2.12	97.88
Rubber and Plastic Products	93.48	6.52	64.01	35.99	17.39	82.61	6.41	93.59	24.43	75.57	13.03	86.97	15.54	84.46
Non-metallic Products	98.58	1.42	89.78	10.22	15.19	84.81	3.05	96.95	45.42	54.58	27.18	72.82	33.54	66.46
Basic Metals	84.62	15.38	23.91	76.09	1.54	98.46	0.99	99.01	3.13	96.87	3.03	96.97	2.57	97.43
Fabricated Metals	98.76	1.24	87.87	12.13	56.88	43.12	10.63	89.37	39.36	60.64	34.24	65.76	45.41	54.59
Machinery and Equipments	94.66	5.34	63.91	36.09	25.82	74.18	4.86	95.14	14.49	85.51	10.76	89.24	14.00	86.00
Office, Accounting and Computing Machinery	42.31	57.69	7.84	92.16	1.78	98.22	0.14	99.86	0.96	99.04	1.06	98.94	0.89	99.11
Electrical Machinery and	94.04	5.96	61.46	38.54	12.65	87.35	4.68	95.32	15.60	84.40	49.60	50.40	13.28	86.72
Radio, Television and Communication Equipment and Apparatus	84.29	15.71	36.21	63.79	6.76	93.24	0.60	99.40	6.93	93.07	2.08	97.92	4.23	95.77
Medical, Precision and Optical Instruments, Watches and Clocks	89.66	10.34	42.85	57.15	13.66	86.34	2.40	97.60	8.63	91.37	6.09	93.91	8.02	91.98
Motor Vehicles, Trailers and Semi-trailers	88.80	11.20	36.47	63.53	6.01	93.99	0.49	99.51	7.03	92.97	2.87	97.13	4.63	95.37
Other Transport and Equipment	88.76	11.24	31.78	68.22	9.47	90.53	1.22	98.78	6.55	93.45	3.70	96.30	5.77	94.23
Furniture	99.83	0.17	97.13	2.87	86.10	13.90	26.07	73.93	73.54	26.46	45.26	54.74	66.86	33.14
Recycling	99.92	0.08	98.39	1.61	99.14	0.86	55.53	44.47	88.24	11.76	89.30	10.70	97.25	2.75
All	**99.28**	**0.72**	**86.15**	**13.85**	**20.56**	**79.44**	**3.34**	**96.66**	**24.23**	**75.77**	**17.76**	**82.24**	**24.43**	**75.57**

Source: Authors' calculations using Annual Survey of Industries 2000-01 and NSSO Report of the 56th Round

Looking at the total number of units in column (i) and (ii) of Table 1, we find that more than 99 per cent of all manufacturing units fall in the unorganized sector. The organized sector accounts for only 0.72 per cent of the enterprises. An industry-wise break up shows that out of the 23 industry divisions, in only 7 divisions, the organized sector's share is greater than 10 per cent. Major industry divisions among these include office accounting and computing machinery (57.69 per cent), radio television and communication equipment and apparatus (15.71 per cent), basic metals (15.38 per cent) etc. Similarly, column (iii) and (iv) show that more than 86 per cent of the manufacturing workforce finds employment in the unorganized sector. Industry divisions where more than 80 per cent of the workers are working in the unorganized sector include recycling (98.39 per cent), furniture (97.13 per cent), wearing apparel, dressing and dyeing of fur (94 per cent), non metallic products (89.78 per cent), tobacco (88.24 per cent), etc. Thus we find that, both in terms of number of enterprises and the number of workers, the Indian manufacturing sector is heavily dominated by the unorganized sector. However, in spite of this overwhelming majority in units and workers, the unorganized sector's contribution to both output and value added is extremely small. Column (xiii) and (xiv) indicate that the unorganized sector accounts for less than one-fourth of gross value added compared to the organized sector. If we look at the total output produced in column (xi) and (xii), the numbers are even more distorted. Here the unorganized sector's share falls to well below 20 per cent. Thus it can be clearly seen that there exists a big discrepancy in the share of the unorganized sector in number of units and workers and its share in gross value added and total output.

The large divergence between share in total population of enterprises and share in value added is almost fully explained by the much higher capital intensity of the organized sector enterprises. This can be seen both in the share of fixed capital and in the share of outstanding loans. The unorganized sector gets slightly more than 20 per cent of the total fixed capital.[7] Overall fixed capital per worker in the unorganized sector is Rs. 0.27 lakhs, while fixed capital per unit is Rs. 0.60 lakhs. On the other hand, for the organized sector these numbers are Rs. 6.67 lakhs and Rs. 321.09 lakhs. Thus the unorganized sector has been forced to work with a fraction of fixed capital available to the organized sector.

The picture for "Outstanding Loans" is even more skewed. Of the total outstanding loan, the unorganized sector gets a miniscule 3.34 per cent. In the organized sector, outstanding loan per unit and outstanding loan per worker turns out to be Rs. 202.26 lakhs and Rs. 4.20 lakhs respectively. In comparison, for the unorganized sector these are Rs. 0.05 lakhs and Rs. 0.02 lakhs. Thus the outstanding loan per unit in the unorganized sector is $1/4000^{th}$ of the organized sector. Similarly, the outstanding loan per worker in the unorganized sector is $1/180^{th}$ of the organized sector. All these features further reinforce the dualistic nature of the Indian manufacturing sector.

[7] According to the NSS 56th Round "Fixed Capital" has been defined as "current market value of the fixed assets." As such both the price and age factors have been incorporated as reflected in the perspective of the owner. On the other hand according to the ASI, "Fixed Capital" is defined as "depreciated value of the fixed assets owned by the factory as on the closing day of the accounting year." Thus the comparisons made in the paper are subject to definitional limitation.

As Table 2 shows the real cost of labour i.e. nominal wages adjusted for productivity appear to be similar across organized and unorganized sector. However, there are significant differences across different industry divisions.

Table 2: Wages and Gross Value Added in Organized and Unorganized Sector (2000-01)

	Wage per Worker (Rs. lakhs)		Gross Value Added per Worker (Rs. lakhs)		Labour Cost (Wages per Gross Value Added)		
	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
	Unorg	Org	Unorg	Org	Unorg	Org	Ratio
Food Products and Beverages	0.022	0.515	0.155	1.923	0.144	0.268	1.862
Tobacco	0.004	0.196	0.070	0.865	0.062	0.227	3.653
Textiles	0.045	0.557	0.140	1.432	0.325	0.389	1.200
Wearing Apparel; Dressing and Dyeing of Fur	0.038	0.409	0.167	1.288	0.229	0.318	1.388
Leather and Leather Products	0.062	0.434	0.237	1.363	0.263	0.319	1.212
Wood and Wood Products	0.013	0.372	0.106	1.189	0.122	0.313	2.557
Paper and Paper Products	0.073	0.758	0.208	2.066	0.351	0.367	1.043
Publishing, Printing and Reproduction of Recorded Media	0.116	1.261	0.339	3.920	0.343	0.322	0.937
Coke, Refined Petroleum Products and Nuclear Fuel	0.078	2.714	0.242	13.792	0.322	0.197	0.612
Chemical and Chemical Products	0.058	1.203	0.163	7.854	0.359	0.153	0.427
Rubber and Plastic Products	0.131	0.723	0.390	3.766	0.337	0.192	0.569
Non-metallic Products	0.058	0.617	0.161	2.797	0.364	0.220	0.606
Basic Metals	0.137	1.328	0.462	5.505	0.296	0.241	0.816
Fabricated Metals	0.075	0.839	0.241	2.099	0.312	0.399	1.281
Machinery and Equipments	0.131	1.373	0.372	4.044	0.354	0.340	0.960
Office, Accounting and Computing Machinery	0.209	1.843	0.469	4.440	0.446	0.415	0.931
Electrical Machinery and	0.165	1.424	0.408	4.252	0.404	0.335	0.829
Radio, Television and Communication Equipment and Apparatus	0.179	1.362	0.403	5.184	0.443	0.263	0.594
Medical, Precision and Optical Instruments, Watches and Clocks	0.155	1.230	0.463	3.979	0.335	0.309	0.924
Motor Vehicles, Trailers and Semi-trailers	0.187	1.420	0.434	5.136	0.431	0.276	0.642
Other Transport and Equipment	0.154	1.021	0.472	3.585	0.326	0.285	0.875
Furniture	0.059	0.721	0.222	3.718	0.267	0.194	0.726
Recycling	0.055	0.449	0.223	0.386	0.247	1.163	4.712
All	**0.041**	**0.793**	**0.162**	**3.124**	**0.251**	**0.254**	1.011

Source: Authors' calculations using Annual Survey of Industries 2000-01 and NSSO Report of the 56th Round

5 Employment Generation

According to the seventh quinquennial survey on Employment and Unemployment carried out in the NSS 61st round (July 2004-2005), 42 per cent of the population of the country was usually employed. The survey also estimates a workforce of 40.825 crores.

Table 3: Sectoral Employment Growth (Current Daily Status Basis)

	Employment (Million)				**Annual Growth (Per cent)**			
Sectors	**1987-88**	**1993-94**	**1999-00**	**2004-05**	**1983 to 1987-88**	**1987-88 to 1993-94**	**1993-94 to 1999-00**	**1999-00 to 2004-05**
Agriculture	163.82	190.72	190.94	238.82	1.77	2.57	0.02	4.58
Industry[a]	47.85	50.99	59.15	73.89	5.61	0.73	2.84	4.55
Manufacturing	32.53	35.00	40.79	47.76	3.64	1.23	2.58	3.21
Services	60.72	75.11	86.65	95.53	4.05	3.61	2.41	1.97
All Sectors	272.39	315.84	336.75	408.25	2.90	2.50	1.07	3.93

a. Industry also includes Construction
Source: Authors' calculations using reports of different NSSO rounds

Looking at Table 3, we find that there have been notable changes in the employment patterns during the latest round, compared to the last round. The late 1990s was a period of a very low growth rate. The overall employment growth rate was only 1.07 per cent. The decline in overall growth rate was primarily due to near stagnation of employment in agriculture. However, the most recent data indicates a strong recovery. Both agriculture and industry experienced strong employment growth rate of above 4.5 per cent during 1999-00 to 2004-05. Within the manufacturing sector, employment grew at slightly lower rate of 3.21 per cent. This was the highest growth rate since mid-1980s. Surprisingly, the service sector witnessed the slowest growth rate of less than 2 per cent during the latest period.

A decomposition of the employment growth rate between the organized and unorganized sector shows that employment has grown faster in the unorganized sector. Within the unorganized sector, industry divisions such as machinery and equipment, basic metals and textiles and leather have recorded impressive employment growth compared to the organized sector. On the other hand, in sectors like other manufacturing (including wood) and chemicals and chemical products employment grew at faster rate in the organized sector.

Table 4: Employment Growth in Manufacturing Sector

(per cent)

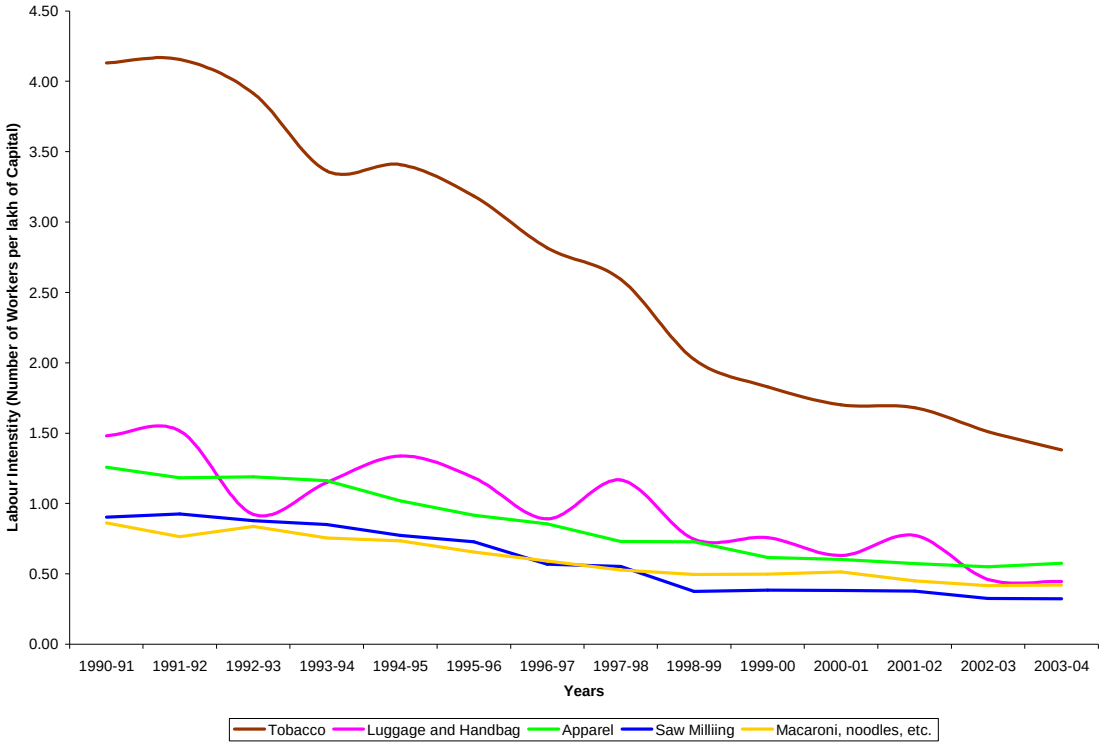
Major Industrial Groups	Unorganized	Organized
Food, Beverages and Tobacco	0.9	0.96
Textiles and Leather	3.05	1.21
Paper and Products	1.69	0.1
Chemicals and Products	0.87	2.02
Non-metallic Mineral Products	0.65	0.82
Basic Metals	3.9	-0.91
Metal Products	2.89	2.05
Machinery and Equipment	4.1	0.82
Transport Equipment	1.44	0.02
Other Manufacturing (Including Wood)	1.29	3.88

*Note: * Period covered for Unorganised Manufacturing is 1989-90 to 2000-01.*
*** Period covered for Organised Manufacturing is 1990-91 to 2003-04*
Source: Kumar et. al. (2007)

According to the Tenth Plan, employment elasticity in the manufacturing sector declined from 0.59 in 1983-88 to 0.33 in 1993-2000. The decline has been particularly significant in the organized and mechanized segments, which has contributed very little to employment generation. Kumar *et. al.* (2007) looks at the change in labour intensity in organized manufacturing sector and finds that there has been a significant decrease in labour intensity across most product groups in the organized manufacturing sector.[8] Figure 15 highlights the change in labour intensity in these products from 1990-91 to 2003-04.

[8] The decrease has been more prominent in highly labour intensive goods. In 1990-91, the top five labour intensive products were (i) tobacco, (ii) luggage, handbags, and the like, saddlery and harness, (iii) apparel except for wearing apparel, (iv) saw milling and planning of wood and (v) macaroni, noodles, conscious and similar farinaceous products and other food products n.e.c.

Figure 15: Labour Intensity in Top Five Labour Intensive Products



Source: Kumar et. al. (2007)

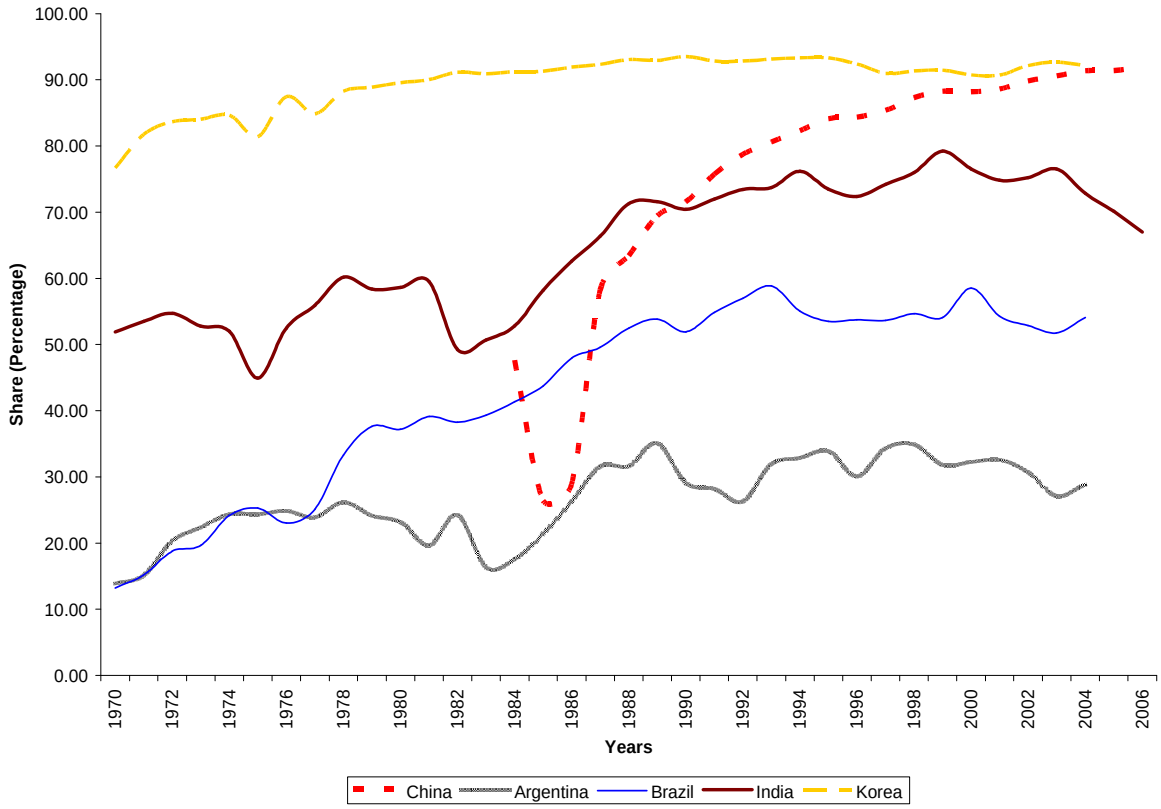
6 Export Performance

Manufactured products have always formed a major part of merchandise exports. However, its share has varied a lot over time. From being just over 50 per cent in 1970, the share of manufacturing product rose steadily to almost 80 per cent in 1999. Over the next few years there has been a decline in the share of manufactured products in total merchandise exports with the share coming down to 72 per cent in 2004 and further to 67 per cent in 2007. This should be a policy concern as this may reflect that the Indian manufacturing sector may well be loosing its competitiveness in global markets.

In a recent article, Kumar and Palit (2006) point out that the latest export figures point unambiguously to a slowdown in India's merchandise exports. During the first seven months of 2006-07, growth rate of merchandise exports was 8 per cent lower than corresponding period of 2005-06. The picture becomes significantly grimmer once we look at the exports growth net of petroleum exports. The latter have grown by 85 per cent during April-October 2006-07 compared to the same period in 2005-06. There is a strong deceleration in manufactured goods exports, which have dropped to 18.3 per cent in 2005-06 from 25 per cent in 2004-05 and further to 14.3 per cent in the first seven months of 2006-07, being less than half of 30.1 per cent in the same months of 2005-06.

Within manufacturing, gems and jewellery, a major foreign exchange earner for India, is likely to suffer an absolute decline in growth for the first time in 2001-02 if the current trend continues. Textile, textile products, and handicrafts are other key industries showing signs of export deceleration. The growth in chemical exports in 2006-07 is almost half of what it was in 2005-06. The silver lining is provided by engineering goods whose exports growth at 37.9 per cent is the fastest among manufacturing. However, even this sector witnessed a marginal decline in its growth rates compared to last year.

Figure 16: Share of Manufacturing Exports to India's Total Merchandise Exports



Source: World Development Indicators 2006

Figure 16 and Table 5 compare the performance of India's manufactured exports with East Asian and Latin American economies. Our manufactured exports were $1/10^{th}$ of China's and India is the perhaps the only Asian economy where the share of manufactured exports in total exports has shown a decline in recent years.

Table 5: Volume of Manufactured Exports (2005)

USD billion

	Argentina	Brazil	China	**India**	Indonesia	South Korea	Malaysia
Iron and steel	1.61	9.07	19.28	**5.30**	0.94	14.35	1.84
Chemicals	3.40	7.29	35.77	**11.08**	4.49	27.75	7.62
Pharmaceuticals	0.40	0.51	3.78	**2.81**	0.11	0.51	0.14
Machinery and transport equipment	4.30	30.47	352.23	**10.21**	13.60	173.49	76.54
Office and telecom equipment	0.08	3.71	225.96	**0.99**	6.74	82.99	60.09
Electronic data processing and office equipment	0.02	0.48	110.70	**0.45**	2.94	17.76	22.92
Telecommunications equipment	0.05	3.06	94.86	**0.29**	3.07	37.75	13.41
Integrated circuits and electronic components	0.00	0.17	20.41	**0.24**	0.74	27.49	23.76
Automotive products	3.05	11.97	9.96	**2.59**	1.27	37.75	0.73
Textiles	0.21	1.33	41.05	**7.85**	3.45	10.39	1.36
Clothing	0.10	0.35	74.16	**8.29**	5.11	2.58	2.48
Manufactures	12.28	61.57	700.34	**69.75**	40.17	258.20	104.86

Source: Statistical Database, World Trade Organization

This relatively poor performance of manufacturing exports in India, as reflected by their declining share in merchandise exports, is a consequence of four principal factors. First, the country has not been able to clearly identify or build upon its comparative or competitive advantages. This is reflected in the absence of any manufactured product category at the four digit level where Indian exports have a greater than 10 per cent share in global trade flows. The only three categories where we do have more than 10 per cent share are silk, slag and ash and carpets, which are all non manufactured products. In contrast, China has a 10 per cent share in products like textiles, garments, footwear, machinery and transport equipment, and office and telecom equipment. As Table 6 reveals, in 24 product categories Indian exports have a more than 1 per cent share in global trade volumes. The interesting part, however, is that out of these motley group, four achieved this only in 2004 and was lower than 1 per cent in 2000. The major weakness of India's export performance has been to have 'scatter shot' rather than a focused approach that would sustain and build the country's competitive advantage.

In recent years there have been several manufacturing products like scientific instruments, whose exports have increased substantially. However, India has been unable to sustain these increases. There are several products in whose exports India can hope to claim a significant share in the near future. These include, electronic and electrical items, processed food items, electro medical appliances, among others. The

government must allow the market to select winners but then focus all its efforts to ensure that these winners become leaders in global markets. This would require a change in the existing strategy practice of fixing aggregate targets, over which it has no control, to fixing 'market share targets' for a small group of established winners. This could be accompanied with a clear plan of action to achieve these targets.

Table 6: Share of Major Manufactured Exports of India in World Exports

		Share *(per cent)*	
HS Code	**Product**	**2000**	**2004**
50	Silk	11.3	11.1
26	Ores, slag and ash	1.9	10.7
57	Carpets and other textile floor coverings	7.5	10.7
71	Pearls, precious stones, metals, coins, etc	6.5	7.4
63	Other made textile articles, sets, worn clothing etc	6.3	7.0
52	Cotton	6.6	4.9
42	Articles of leather, animal gut, harness, travel goods	4.1	3.5
53	Vegetable textile fibres nes, paper yarn, woven fabric	4.5	3.5
25	Salt, sulphur, earth, stone, plaster, lime and cement	2.7	3.3
67	Bird skin, feathers, artificial flowers, human hair	1.7	3.0
62	Articles of apparel, accessories, not knit or crochet	3.6	2.9
68	Stone, plaster, cement, asbestos, mica, etc articles	1.9	2.7
41	Raw hides and skins (other than fur skins) and leather	1.8	2.4
55	Man-made staple fibres	2.0	2.4
61	Articles of apparel, accessories, knit or crochet	2.1	2.3
46	Manufactures of plaiting material, basketwork, etc.	0.1	2.0
29	Organic chemicals	1.2	1.7
64	Footwear, gaiters and the like, parts thereof	1.4	1.7
32	Tanning, dyeing extracts, tannins, derivatives, pigments, etc	1.5	1.6
58	Special woven or tufted fabric, lace, tapestry, etc	2.4	1.4
72	Iron and steel	0.9	1.3
28	Inorganic chemicals, precious metal compound, isotopes	0.6	1.0
73	Articles of iron or steel	1.2	1.0
83	Miscellaneous articles of base metal	0.5	1.0

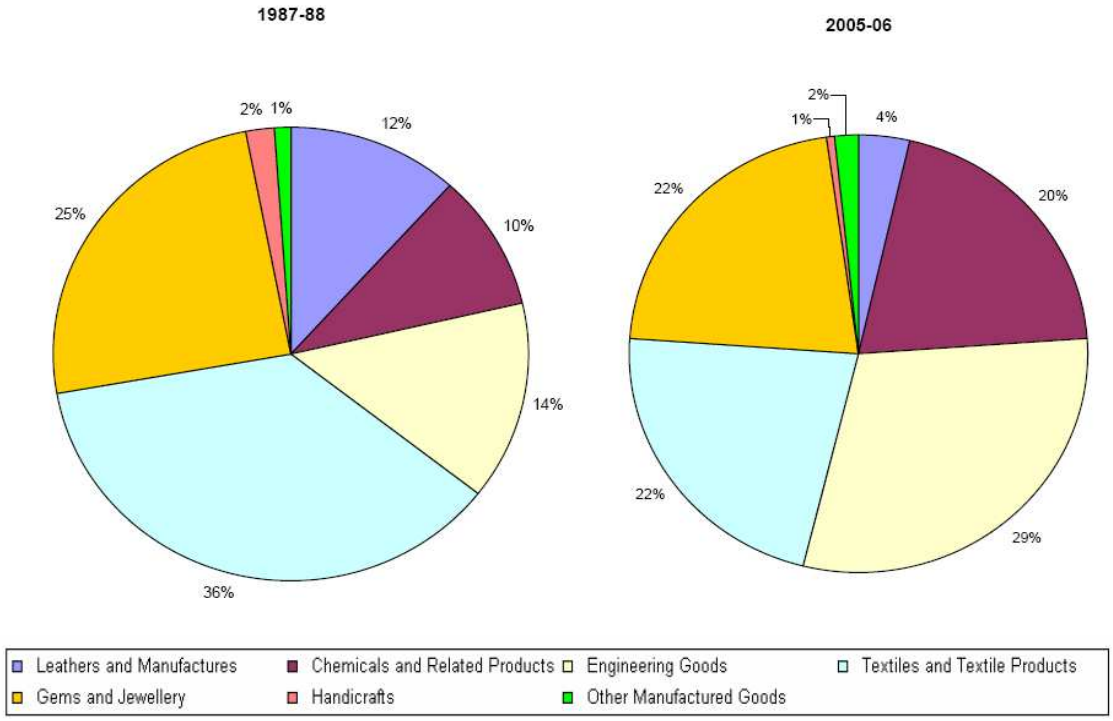
Source: Economic Survey 2005-06

The second main reason for the weak performance has been that India's manufactured exports have languished in the 'low value added' categories and are often 'concentrated' in 'sunset' segments. The latter feature was noted as early as 1982 by Martin Wolf (1982) who points out that India's export purchasing power in the early 1980s was far behind that of petroleum exporters as well fast growing manufactured goods' exporters.

Looking at the overall composition of exports in Figure 17, it can be clearly seen that there has been a significant change in the composition of Indian manufacturing

exports during the last 20 years.[9] In 1987-88, textiles and textile products constituted the bulk of Indian exports accounting for more than one-third of total exports. By 2005-06, its share had come down to less than one-fourth. Similarly, the share of leathers and manufactures also declined from 12 per cent to 4 per cent during this period. Gems and jewellery, which has always been an important component of Indian exports, also experienced a small decline in its share. On the other hand, engineering goods, which accounted for only 14 per cent of manufactured exports in 1987-88, more than doubled its share to 29 per cent by 2005-06. Chemicals and related products also doubled its share from 10 per cent to 20 per cent during this period.

Figure 17: Change in Composition of Manufactured Exports



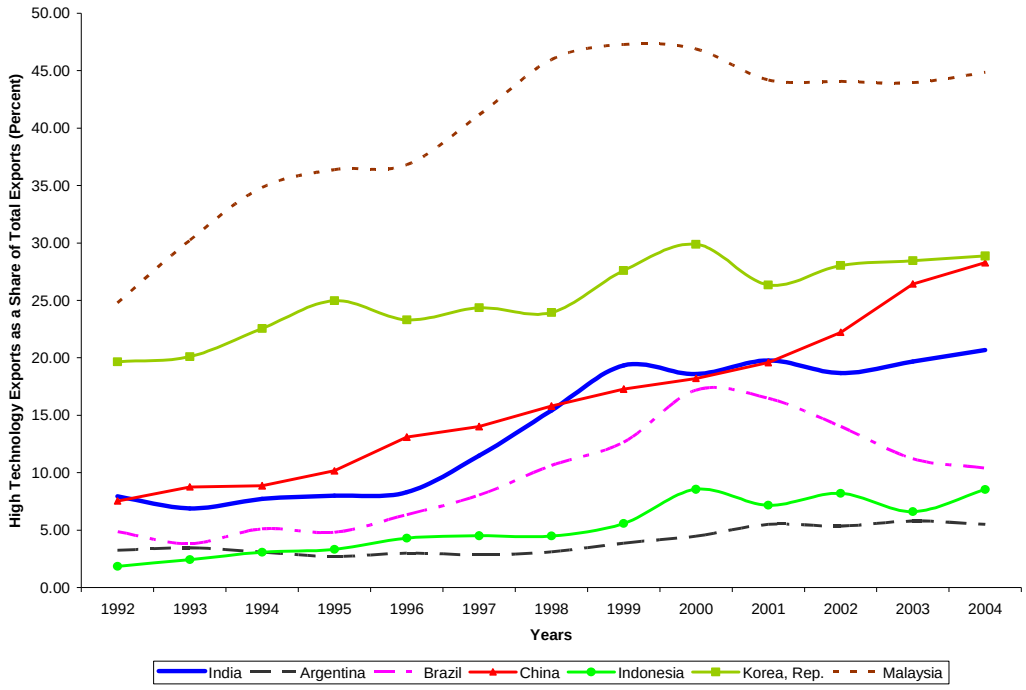
Source: Handbook of Statistics on Indian Economy, Reserve Bank of India, 2005-06

A further decomposition of the major industry divisions show that majority of the products that are being exported are low value products. The concentration of exports in low value categories is the third factor that explains the relatively weak performance of Indian manufactured exports. A product-wise break up of the largest segment, engineering goods, shows that out of the total 29 per cent, nearly 11 per cent of exports are made up of iron and steel and manufacture of metals. High value electronic products only form 3 per cent of manufactured exports. Similarly in chemicals and related products, of the total 20 per cent, nearly 12.5 per cent of exports take the form of basic chemicals, pharmaceuticals and cosmetics.

[9] Due to change in commodity classification by DGCI&S, data before 1987-88 will not be strictly comparable to the latest data.

India's share in export of advanced technology product is extremely small. According to a recent report published by the National Science Foundation, the United States imported advanced technology products worth $238.5 billion in 2004.[10] China was the leading exporter with exports worth, $45.7 billion, followed by Japan, Mexico, Malaysia and South Korea. India exported $0.32 billion worth of advanced technology products and was ranked 36th behind countries like Costa Rica, Dominican Republic and Czech Republic. High technology exports have always formed a very small part of India's manufactured exports.[11] In terms of high technology exports, India lags far behind all major developing economies. In Malaysia, such exports form a staggering 55 per cent of total manufacturing exports. Malaysia houses some of the world's leading exporters of semiconductors, air conditioners and consumer electronics. Malaysia has developed several Free Trade Zones and Industrial Parks to support the manufacturing sector.

Figure 18: Export of Technology Intensive Goods and Services



Source: World Development Indicators 2006

In countries like China and South Korea, high technology exports are around 30 per cent of total manufactured exports. On the other hand, in India their share is below 5 per cent. In India, high technology sectors like hardware and electronics faced several constraints during the 1980s and 1990s like distorted tariff structure, reduced access to foreign exchange, inadequate infrastructure, inadequate spending on R&D, etc., which have severely restricted the growth of this sector to international standards.

[10] Science and Engineering Indicators 2006

[11] High-technology exports are products with high R&D intensity, such as in aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

However, India has done relatively better if we look at the combined exports of technology intensive goods and services. Figure 18 shows that India's share of technology intensive exports in overall exports has been around 20 per cent during the last few years. This is higher than Latin American economies like Argentina and Brazil as well as some Asian economies like Indonesia, but lower than other Asian economies like China, South Korea and Malaysia. In China and South Korea such exports account for more than 28 per cent of overall exports. In the late 1990s, India's share was greater than China owing to the boom in export of IT-enabled services. However, since then China has overtaken India primarily due to a rise in export of technology intensive goods.

The fourth factor affecting Indian manufactured exports is the relatively poor inflow of foreign direct investment (FDI) especially in export oriented industries. Total FDI flows until March 2006 was only $38.90 billion, which improved to $50.10 billion by January 2007. However, of this amount, less than 10 per cent have gone towards export-oriented units. The majority of the investment continues to be destined for domestic market production. FDI for exports has significant advantages in terms of their marketing tie-ups, buy back arrangements, product knowledge etc. Lall (2000) points out that export success is highly linked to the ability to attract more and better FDI. Given increasing globalization and a larger role of MNCs in trade and innovation, it is very important for countries to secure not just more but higher quality FDI, which involves attracting more advanced MNC activities, oriented to international markets, providing technology, using and creating sophisticated skills and taking the host economy into dynamic systems of international production.

India needs to review more carefully its policies towards FDI and identify the factors that continue to thwart these inflows into the export oriented sectors *a la* China, Malaysia and other East and South East Asian economies. The SEZ policies should be pursued vigorously and transparently as it has the potential to reduce procedural hassles and the uncertainty attached to the supply of necessary utilities, infrastructural facilities and other inputs. SEZs have the potential to change the scenario for manufactured exports from India.

7 Transition to Mass Manufacturing: Prospects and Issues

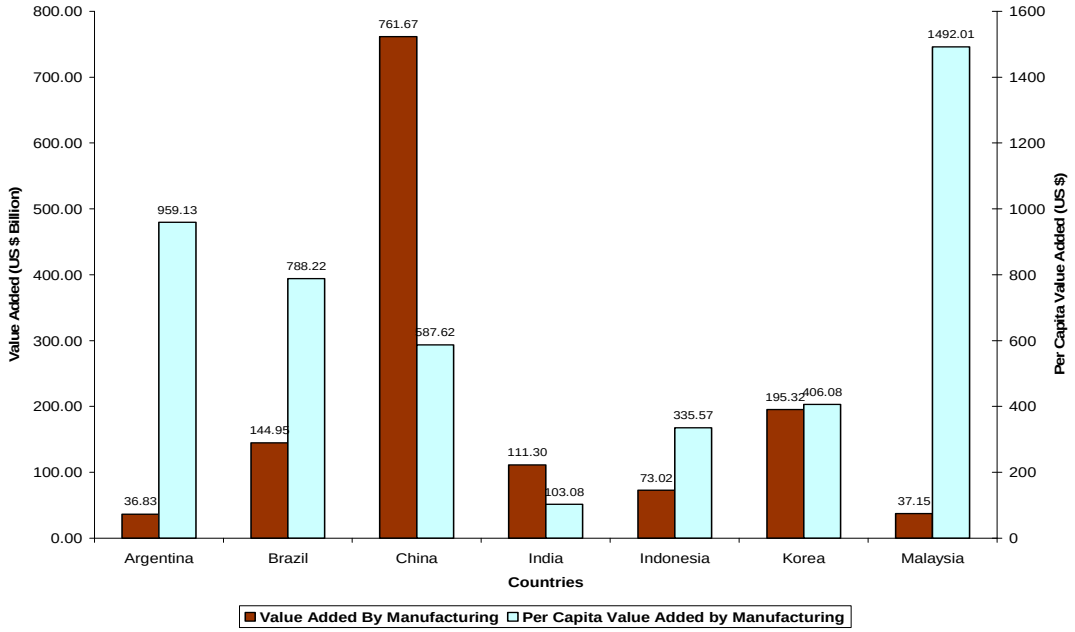
It is a well known fact that India is the largest user of WTO compatible provisions for anti-dumping suits, most of which are directed against Chinese manufactured imports. This reflects both the non-transparent nature of price discrimination by Chinese exporters as also the revealed competitive weakness of Indian firms even in their domestic markets. One of the key drivers of the competitive strengths of the Chinese firms is the significant cost advantages that accrue from economies of scale now enjoyed by them. These have come about by the successful transition to mass manufacturing by Chinese firms helped in great measure by their foreign joint venture partners that have brought in FDI and export orders.

India today faces the key question – whether it should in effect vacate the large manufacturing spaces to China, given their strong competitive strengths and concentrate its resources in building a lead in the services sector and small niche of complex technology and design intensive manufacturing products. In our understanding, India can not afford to move away from the entire light engineering

and simple manufacturing, simply because if it does so, it will be unable to generate the required number of employment opportunities for the growing working population, including workers moving out of agriculture. The key question, however is, whether or not the Indian manufacturing firms can also make the transition to mass manufacturing.

Comparing the scale of operations in India's manufacturing sector with other countries, we can see that the sheer size of China dwarfs all other developing countries. The value added by the manufacturing sector in India is less than 15 per cent or $1/8^{th}$ that of China. Even smaller countries (in terms of GDP and population) like South Korea and Brazil have larger manufacturing sectors than India.

Figure 19: Cross-country Comparison of the Manufacturing Sector (2004)



Source: World Development Indicators 2006

The picture is even more dismal if we look at the per capita value added across different countries. India ranks well below most of the major developing nations. Its per capita value added is one-fifth of China and one-fifteenth of Malaysia. Looking at the absolute scale of some key manufactured products in Table 7 we again find that China is way ahead of all other countries. The manufacturing sector in China has evolved tremendously in terms of capabilities to mass manufacturing products at low costs. India, on the other hand, is well behind and clearly not in the same league, as most of its emerging economy competitors.

The significantly larger scale of manufacturing in some of India's major competitors is expectedly reflected in the size of the manufacturing sector workforce. From Figure 21 it can be seen that India ranks next only to China in terms of the size of the workforce. This implies that in countries like South Korea and Malaysia, even with a fraction of India's labour force, the manufacturing sector has contributed significantly more in terms of value added showing a far higher value added per worker. This

points again to the dualistic structure of India's manufacturing sector. India's transition to mass manufacturing can be achieved only if the problem of the "missing middle" or the dualistic structure of its manufacturing can be effectively addressed.

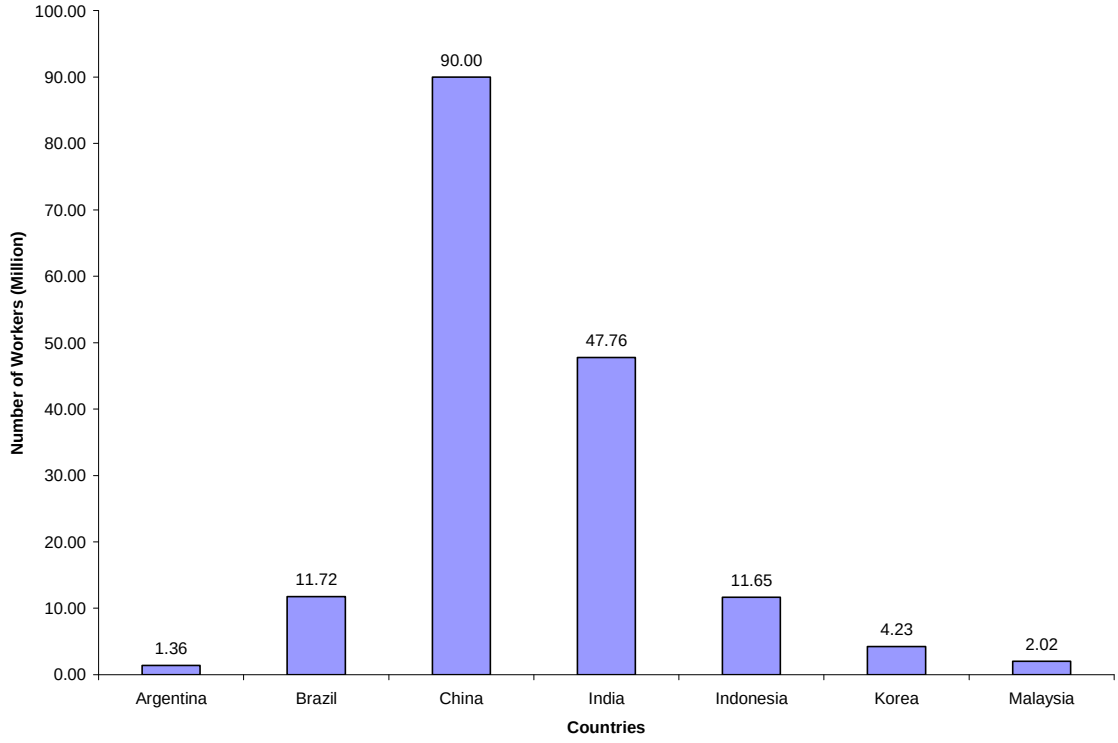
Table 7: Cross-country Comparison of Production of Some Key Products

	Personal Computers (Million)	Motor Vehicles (000s)	Steel (MMT)	Telephone Mainlines (Million)
Argentina	3.70	319.75	5.39	8.7
Brazil	19.35	2528.30	31.62	42.38
China	52.99	5707.69	352.54	312.44
India	13.03	1626.76	38.08	43.96
Indonesia	3.02	494.55	--	9.99
South Korea	26.20	3699.35	47.77	26.05
Malaysia	4.90	--	--	4.45

Source: Word Development Indicators, International Organization of Motor Vehicle Manufacturers and International Iron and Steel Institute

Note Figures for Personal Computers and Telephone Mainlines are for 2004, while figures for Motor Vehicles and Steel are for 2005.

Figure 20: Cross-country Comparison of Workers in the Manufacturing Sector (2004)



Source: ADB Database

There could be other reasons for this relatively poor performance of the manufacturing sector.[12] Poor quality and irregular supply of infrastructure and intermediate services such as power, roads, ports, airports, etc., that are predominantly in the public sector, act as a major constraint for the transition to mass-manufacturing. Typically, there are two possible routes to achieve mass manufacturing. The first one is to expand manufactured exports far more vigorously and increase our shares in major global markets. This would bring about a transformation of our export structure, which as Table 6 above showed had very few products in which India enjoys any significant share in world exports. To be able to successfully achieve far higher share in global markets and generate mass employment in export oriented industries, one of the routes would be to emulate China in attracting much greater volume of FDI. Even though in recent years India has replaced United States as the second most attractive destination for FDI in manufacturing, actual volume of FDI inflow continues to be substantially lower than China.[13] In 2006 India received a net $11.12 billion in foreign direct investment (FDI), less than a fifth of China's $63 billion.

The second route is to develop a manufacturing sector that can cater to the domestic demand and at the same time increase the size of the domestic market. However, here it must be understood that despite the recent surge in growth rates, India is still a largely poor country. According to the recent NSSO survey report, the number of people below the poverty line is in the range of 220 to 230 million. With a per capita GDP of $3,700 in PPP terms, the overall purchasing power of the country is quite low. This low purchasing power of the country as a whole makes it mandatory for the manufacturing sector to produce goods that are affordable and still of high quality. The only way this is possible is by investing heavily in R&D and achieving far greater product innovation that satisfies the specific requirements of the Indian market. This would be a critical part of the process for "producing for the bottom of the pyramid" as articulated by Prof. C.S. Prahlad. Moreover, in global markets, product life cycles are getting shorter and product innovation is emerging as a key determinant of competitiveness. This implies that retaining their shares in both domestic and foreign markets and especially to rely on expanding domestic demand to support the transition to mass manufacturing, Indian firms will have to strengthen their R&D and technological capabilities.

Looking at the share of R&D spending in GDP in Table 8, it can be seen that India is one of the smallest spenders on R&D among developing countries. Moreover, in India the bulk of the R&D spending is cornered by defence related organizations like DRDO, ISRO and Department of Atomic Energy. As a result, R&D spending on manufacturing is woefully short of global standards. Similarly, India is also facing an acute shortage of researchers. India has one of the lowest number of researchers among major developing countries. There are only 120 researchers for every million people. This is $1/5^{th}$ of China and $1/25^{th}$ of South Korea. The last column of Table 8 shows that India is also the smallest importer of foreign technology. In China, the amount spent on royalties and license fees as a percentage of GDP was three times that of India, while in South Korea it was more than 11 times.

[12] NMCC (2006) provides an excellent overview of the major challenges facing Indian manufacturing and provides several key recommendations as to how they can be dealt with.
[13] ATKEARNY (2005)

Table 8: Cross-country Comparison of Research and Development (2005)

	Spending on R&D as a percentage of GDP[a]	Number of Researchers per Million People[b]	Amount Spent on Royalties and Licence Fees as a percentage of GDP[c]
Argentina	0.42	715	0.23
Brazil	1.03	324	0.19
China	1.30	633	0.14
India	0.77	120	0.05
Indonesia	0.2	413	
South Korea	2.5	2970	0.57
Malaysia	0.70	294	

Source: Human Development Report 2005 and IMF Balance pf Payment Statistics 2006

Note: a. Research and development is defined as current and capital expenditures (including overhead) on creative, systematic activity intended to increase the stock of knowledge. Included are fundamental and applied research and experimental development work leading to new devices, products or processes

b. People trained to work in any field of science who are engaged in professional research and development (R&D) activity. Most such jobs require the completion of tertiary education.

c. Royalties and license fees cover the exchange of payments and receipts between residents and non-residents for the authorized use of intangible, non-produced, non-financial assets and propriety rights and with the use, through licensing agreements, of produced originals or prototypes.

In 2005, India's total domestic spending on R&D rose an estimated 9.7 per cent to $4.9 billion, or 0.77 per cent of GDP. China, on the other hand, is spending more than 1.3 per cent of its GDP, equivalent to $29.4 billion, on R&D. China plans to increase its R&D investment to 2 per cent of GDP by 2010 and 2.5 per cent by 2020. The relatively low spending on R&D is seriously hampering India's potential to export Advanced Technology Products (ATP). As stated earlier, in 2004, the United States imported around $238 billion worth of ATPs. While countries like China, Malaysia, South Korea and Taiwan were the main sources of these imports, India was ranked 36th, and accounted for only $0.32 billion of such imports into the United States.[14]

As can be seen from Table 9, India's relative weakness in R&D is also reflected in the number of patents India has obtained in recent years. Measuring across three yardsticks, that is, patents filed per million population, patents filed per billion GDP and patents filed per million R&D expenditure, India's performance has been rather weak.

[14] Science and Engineering Indicators 2006

Table 9: Cross-country Comparison of Resident Patent Filed (2004)

	Patent Filings per Million Population	Patent Filings per $ Billion GDP	Patent Filings per $ Million R&D Expenditures
Argentina	28.41	2.32	0.56
Brazil	21.16	2.81	0.29
China	50.75	9.37	0.71
India	6.65	2.3	0.22
South Korea	2188.96	116.19	4.4
USA	645.44	17.7	0.68

Source: World Intellectual Property Organization

In India, the government is still expected to be the predominant R&D player. Even in 2005, 70 per cent of the total spending on R&D was carried out by Central and State governments, with public sector industries accounting for another 5 per cent. Private sector industries contributed only 20 per cent of the total R&D spending with universities and other higher education contributing less than 5 per cent. For achieving higher market share and accelerating the growth in domestic markets it is imperative that the private sector and universities step up their spending on R&D and strengthen their collaboration for commercializing their R&D. In any case the R&D effort has to be greatly strengthened if Indian manufacturing is to become competitive.

Given the rather weak and public sector dominated R&D capacity, the private sector manufacturing firms may have to rely on more technological advances from their joint venture partners for product innovation, both for domestic and foreign markets. Greater attention to R&D and more openness to FDI may both be crucial for achieving the transition to mass manufacturing.

Apart from low levels of R&D and FDI, some other major issues to be addressed for achieving greater competitiveness are i) presence of entry barriers, ii) labour market rigidities, iii) procedural constraints, iv) exit barriers, v) emerging skill constraints, and vi) infrastructure. We discuss some of these in greater detail in the following paragraphs.

(i) **Entry Barriers**: A major impediment faced by new entrants relates to procedures associated with starting a business in India. There are 11 procedures involved in starting a business, beginning from presenting the name of the company for approval to the registrar of companies (ROC) to registering for employees' provident fund and medical insurance. As shown in Table 10, while these procedures are necessary and must be put in place, the time required to cover these procedures can be reduced. While in India, it takes 35 days to start a business, it only takes 5 days in the United States and 6 days in Singapore. Moreover, Wold Bank's "Doing Business in South Asia" also lists high start-up costs as a major impediment to starting business in India.

(ii) **Labour Market Rigidities**: Compared to other developed as well as some developing countries like China, South Korea, Malaysia, etc., companies find it relatively difficult to hire workers. India is even more rigid when it comes to firing workers. Table 10 shows that among the major developed and developing countries, India scores extremely high on difficulty of firing index. Only Egypt, Venezuela and Peru score higher on this index.

The single most important labour law is arguably the Industrial Disputes Act of 1947. This law almost makes it impossible for firms to fire workers. An amendment to this act in mid-1980s requires that any firm employing more than 100 workers needs to get permission from the state government before retrenching workers. Such laws leave absolutely no room for free contracting and hiring contract workers that may be required seasonally to meet additional demand. The net effect of the prevailing labour market regime is to convert labour into a fixed cost and one that also results in significant transaction costs and source of uncertainty. This results from the prevailing statutory provisions that give almost complete and unquestioned authority to the government in matters relating to labours' working and employment conditions. The net result is deterrence to labour intensive and large scale investment and a binding constraint on SMEs trying to achieve greater scale.

There is a need for a law that allows employers greater flexibility in hiring labour in line with the specific requirements. Some workers may sign a contract for a high wage but one that requires them to quit at short notice; others may seek the opposite. This would allow firms to employ different kinds of labour depending on the volatility of the market they operate in. Hiring and firing of workers is not the only or even the most important issue in the current circumstances of skill scarcity and high attrition rates but there is an urgent need to improve the existing labour dispute resolution system. As of October 2005 there were as many as 1,61,117 cases pending in the various labour courts in India

(iii) **Procedural Constraints**: Entrepreneurs also face a significant delay in registering property in India. According to Table 10, in India it takes 62 days to register a property compared to 32 days in China, 11 days in South Korea and 6 days in the United States. Moreover, entrepreneurs have to go through significantly more procedures to enforce contracts in India, which leads to substantial delays. Apart from having to go through more procedures in India, entrepreneurs also find that the average time on each procedure in India is far higher than other countries. For example, in India it takes an average of 25.36 days to complete one procedure to enforce a contract compared to 9.42 days in China and 7.93 days in South Korea. Again, this is primarily due to the stifling culture of red tape and needs to be curbed.

(iv) **Exit Barriers**: Apart from stringent entry barriers, entrepreneurs also have to deal with very complex and dysfunctional exit barriers. It normally takes 10 years for a firm to close its business in India, compared to 2.4 in China and 1.5 in South Korea (Table 10). This has significantly impeded the entry of new players into Indian manufacturing. Again, a careful review of the existing procedures is needed and redundant procedures weeded out.

Table 10: Doing Business across Countries

	Starting a Business		Dealing with Licences		Employing Workers		Registering Property		Enforcing Contracts		Closing a Business	
Country	**Procedures (number)**	**Time (days)**	**Procedures (number)**	**Time (days)**	**Difficulty of Hiring Index**	**Difficulty of Firing Index**	**Procedures (number)**	**Time (days)**	**Procedures (number)**	**Time (days)**	**Time (years)**	**Recovery rate (cents on the dollar)**
Argentina	15	32	23	288	44	20	5	44	33	520	2.8	36.2
Bangladesh	8	37	13	185	11	40	8	425	50	1,442	4	24.9
Brazil	17	152	19	460	67	0	14	47	42	616	4	12.1
China	13	35	29	367	11	40	3	32	31	292	2.4	31.5
Hong Kong	5	11	22	160	0	0	5	54	16	211	1.1	78.9
India	**11**	**35**	**20**	**270**	**33**	**70**	**6**	**62**	**56**	**1,420**	**10**	**13**
Indonesia	12	97	19	224	61	50	7	42	34	570	5.5	11.8
South Korea	12	22	14	52	11	30	7	11	29	230	1.5	81.8
Malaysia	9	30	25	281	0	10	5	144	31	450	2.3	38.7
Mexico	8	27	12	142	33	40	5	74	37	415	1.8	63.2
Pakistan	11	24	12	218	78	30	6	50	55	880	2.8	39.9
Singapore	6	6	11	129	0	0	3	9	29	120	0.8	91.3
Taiwan, China	8	48	32	206	78	30	3	5	28	510	0.8	89.5
Thailand	8	33	9	127	33	0	2	2	26	425	2.7	42.6
United Kingdom	6	18	19	115	11	10	2	21	19	229	1	85.2
United States	5	5	18	69	0	0	4	12	17	300	1.5	77

Notes: The Difficulty to Hiring/Firing Index goes from 0 to 100
Source: Doing Business in 2006 (World Bank and International Finance Corporation)

(v) **Emerging Skill Constraints**: The competitiveness of the Indian manufacturing is heavily dependent on the availability of a low-cost skilled workforce. In recent years several industries are experiencing an increasing shortage of skilled workers. To meet this demand, there is a need to undertake significant reforms in the education sector. The policy focus so far has been on raising literacy levels and improving access to primary education through schemes like *Sarva Shiksha Abhiyan* on the one hand and establishing some top world class institutes like IITs, IIMs, etc. There is a case of the 'missing middle' in the education sector also, which refers to the relatively weak vocational and technical education sector. The number of vocational schools and courses are only a tenth of that in China and a massive resource infusion is needed to address this issue.

(vi) **Infrastructure**: It is now widely recognized and commented upon that the manufacturing sector suffers from a severe infrastructure deficit. A range of estimates for resources required to address the deficit is available with some studies suggesting a requirement of $350 billion over the next five years. Given the constrained fiscal space, these resources cannot come only from public investment. Hence the strong emphasis given in recent years to promoting public-private partnership and for creating necessary regulatory framework for facilitating private investments needs to be encouraged further. The target for India should be to raise the investment in infrastructure from its current level of about 3 per cent to 9 per cent of GDP as has been achieved by China.

Some progress has been made, notably in the telecom sector where reforms were initiated in the mid-1990s. The supply response has been tremendous with teledensity increasing from 0.8 per cent in 1994 to nearly 13 per cent at the end of 2006. The telecom sector has attracted around $16.61 billion in foreign investment since 1991.

The Electricity Act of 2003 has provided the statutory basis for reforming the sector. Some states have implemented the provisions of the Act but others have not. Some major issues like transmission and distribution losses, continued loss making by State Electricity Boards and extensive subsidy to some consumer groups like the farmers are yet to be addressed. There has been an unfortunate regression in the sector from 1994 when all the states had agreed to charge a minimum tariff even for electricity supplied to farmers.

The Electricity Commissions, created under the 2003 Act in every state and in the Centre, have been asked to rationalize tariff to progressively reflect cost of supply and institute anti-theft provisions. To ensure a competitive manufacturing sector it should not be burdened with subsidizing power to other sectors and should also be allowed "open access" to power supply. This would imply that the units can directly source their electricity from any generator located anywhere in the country. These would introduce competition and propel states to perform better.

The development of the Golden Quadrilateral (GQ) and East-West (EW) and North-South (NS) corridor projects are steps in the right direction and must be

given highest priority. Special attention must be paid to development of high speed roads and railway links connecting hinterland to ports. The 1995 Amendment to the National Highways Act of 1956 allows private investment in road development, maintenance and operation and this is beginning to show results with significant private sector participation in the national highways sector.

Two other areas, however, need special and urgent attention. First, the urban infrastructure, especially in Tier I and Tier II cities and towns has deteriorated under the presence of rural to urban migration and sheer lack of investment by municipal authorities. Secondly, the project design and implementation capacity in both the Central and State governments has to be augmented. This would include means to remove inter-ministerial bottlenecks that presently create great uncertainties and risks in the execution of infrastructure projects.

(vii) **Foreign Direct Investment**: The Chinese experience shows that FDI can play a major role in transition to mass manufacturing. FDI not only brings capital into the country but also advanced technology, know-how, managerial expertise, global marketing networks and best-practice systems of corporate governance. Thus there are considerable spillover effects that work through supply chains and spin-offs, which will facilitate the transition to mass manufacturing.

In India, there has been considerable liberalization of the FDI-related policies since 1991. However, the flow of FDI has not been very encouraging. From August 1991 to March 2000, cumulative FDI in India was only $16.48 billion at an average of $1.83 billion per year. Though FDI flows have picked up in recent past, even for the period 2000-06, FDI inflows averaged a mere $5.5 billion per year. It is only in 2006-07 that FDI inflows have picked up substantially. In the first 10 months of the fiscal year around $16.44 billion of FDI had come into India.

As per the extant policy, FDI up to 100 per cent is allowed, under the automatic route, in most sectors/activities. FDI under the automatic route does not require prior approval either by the Government of India or the Reserve Bank of India (RBI). However, some irritants do remain, which have impeded the flow of FDI into country to an extent. For example, Press Note No. 18 (1998 series) points out that automatic route for FDI would not be available to those who have or had previous joint ventures in the same or allied field in India. Investors belonging to this category will have to go through the FIPB/PAB approval route and they have to provide requisite justification and proof that the new venture will not jeopardize the current interests of their existing or former joint venture partners.

These issues related to FDI need to be addressed urgently for India to undertake a successful transition to mass manufacturing. Thus while it is important that Indian indigenous manufacturers themselves upscale to mass production levels, FDI can also play a very important role in the transition.

8 Conclusion

This paper tried to undertake a broad evaluation of the Indian manufacturing sector. During the last few years the manufacturing sector has witnessed impressive growth, which has helped the GDP to post historically high growth rates. Currently, manufacturing sector is witnessing its longest period of upswing since the 1980s but there is a clear divergence between the performances of sectors that are primarily privately owned, namely, manufacturing, steel and cement and sectors that are primarily in the public sector like coal, electricity and crude petroleum. A state-wise analysis reveals wide differentials in the performance across states with Tamil Nadu and Gujarat having significantly increased their share in manufacturing output while West Bengal and 'BIMARU' states have been the biggest losers. Better quality of infrastructure and skill availability expectedly emerge as two key determinants of the growth of manufacturing sector across states.

The paper finds that the unorganized sector is overwhelmingly dominant in terms of number of enterprise and its share in total manufacturing sector workforce. However, the sector is only a marginal contributor to value added. Thus, the unorganized sector is characterized by extremely low value added per worker. The paper argues that this problem of the dualistic structure of Indian manufacturing sector and the 'missing middle' is a direct consequence of public policy. This needs to be rectified.

The manufacturing sector, especially the organized manufacturing, has failed to generate adequate employment. The primary reason for this is widespread automation and decline in labour intensity, principally in response to the prevailing policy regime, in both organized and unorganized sectors. Evaluating the export performance, the paper finds that although there have been significant changes in the composition of exports in the last 20 years; India is still a very small player at the global level, especially in knowledge intensive and advanced technology products. The surprising and the disappointing feature has been the decline in the share of manufactured exports in total exports in recent years.

Finally, the paper explores India's prospects for successfully making the transition to mass manufacturing and emerging as a hub for manufacturing exports. The main challenges in doing so are the low level of R&D and scarcity of skilled personnel in India. Other impediments to the realization of this transition, essential for generating the required employment opportunities, are inadequate infrastructure, entry and exit barriers and low volumes of foreign direct investment.

Sustaining a rapid growth of manufacturing and achieving the transition to mass manufacturing requires another major push to the reform agenda. In the absence of these reforms, the manufacturing sector will continue to retain its dualistic structure and be unable to address the apparent trade-off between growth and equity that can be best addressed by massive expansion in manufacturing sector employment.

References

Ahluwalia, I.J. (1991), Productivity and Growth in Indian Manufacturing, Oxford University Press, New Delhi

ATKEARNY (2005), "Foreign Direct Investment Confidence Index," Global Business Policy Council.

Besley, T. and R. Burgess (2004), "Can Labour Regulation Hinder Economic Performance? Evidence from India," *Quarterly Journal of Economics*, 119(1)

Burange, L. (1999), "Industrial Growth and Structure: Manufacturing Sector in Maharashtra." *Economic and Political Weekly*, February 27; pp. M39–M48.

Burgess, R. and R. Pande (2005), "Do Rural Banks Matter? Evidence from the Indian Social Banking Experiment," *American Economic Review* 95 (3)

Das, D.K. (2002), "Trade Liberalization and Industrial Productivity: An Assessment of Developing Country Experiences," ICRIER Working Paper No. 77

Desai, A. (2001), "A Decade of Reforms," *Economic and Political Weekly*, Vol. 49 December 15

Government of India, (2006), "Towards Faster and More Inclusive Growth: An Approach to the 11th Five Year Plan", Planning Commission.

Kelkar, V.L. and R. Kumar (1990), "Industrial Growth in the Eighties: Emerging Policy Issues," *Economic and Political Weekly*, January 27, pp 209-222

Kochhar, K., K. Kumar, R, Rajan, A. Subramanian and I Tokatlidis (2006), "India's Pattern of Development: What Happened, What Follows?" IMF Working Paper 06/22.

Kumar, R., D. K. Das, and D. Wadhwa (2007), "Labour Intensity and Employment Potential of Indian Manufacturing." ICRIER Working Paper, *Forthcoming*

Kumar, R. and Palit, A. (2007), "Has the Fuel Run Out of Indian Exports," *Business Standard*, February 26.

Lall, S. (2000), "The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-1998," Queen Elizabeth House, University of Oxford, Working Paper No. 44

Lahiri, A. and K-M.Yi (2006), "A Tale of Two States: Maharashtra and West Bengal," Federal Reserve Bank of Philadelphia, Working Paper 06-16

Mazumdar, D. (1998), "Size-Structure of Manufacturing Establishments and the Productivity Differentials between Large and Small Firms: A Comparative Study of Asian Economies," CIS Working Paper No. 7, University of Toronto

Mitra, A., A. Varoudakis and M-A Véganzonès Varoudakis (2002), "Productivity and Technical Efficiency in Indian States' Manufacturing: The Role of Infrastructure" *Economic Development and Cultural Change*, 50: pp 395-426.

NMCC (2006), The National Strategy for Manufacturing. The National Manufacturing Competitiveness Council.

Nagraj, R. (1990), "Industrial Growth: Further Evidence and Towards an Explanation and Issues," *Economic and Political Weekly*, Vol. 25, No. 41, October 13, 1990.

Nagraj, R. (2003), "Industrial Policy and Performance: Which Way Now?" *Economic and Political Weekly*, August 30-September 5, 2003, Vol. 38, No. 35

Tybout, J.R. (2000), "Manufacturing Firms in Developing Countries: How Well Do They Do and Why?" *Journal of Economic Literature*, Vol. XXXVIII, March, pp. 11-44

Wolf, M. (1982), "India's Exports," World Bank, Oxford University Press

World Bank, (2003), "Improving the Investment Climate in India," World Bank, Washington DC

LATEST ICRIER'S WORKING PAPERS

NO.	TITLE	AUTHOR	YEAR
202	SOUTH ASIAN INTEGRATION PROSPECTS AND LESSONS FROM EAST ASIA	RAMESH CHANDRA RAJIV KUMAR	JANUARY 2008
201	DETERMINANTS OF COMPETITIVENESS OF THE INDIAN AUTO INDUSTRY	BADRI NARAYANAN G. PANKAJ VASHISHT	JANUARY 2008
200	INDIA PAKISTAN TRADE POSSIBILITIES AND NON-TARIFF BARRIERS	NISHA TANEJA	OCTOBER 2007
199	ECONOMY-WIDE IMPACT OF EXPORT PROMOTION SCHEMES: A QUANTITATIVE ASSESSMENT OF SEZS, EOUS AND STPI	ARADHNA AGGARWAL	SEPTEMBER 2007
198	IMPACT OF PREVENTIVE HEALTH CARE ON INDIAN INDUSTRY AND ECONOMY	ALKA CHADHA ALI MEHDI GARIMA MALIK	SEPTEMBER 2007
197	CAN HORTICULTURE BE A SUCCESS STORY FOR INDIA?	SURABHI MITTAL	AUGUST 2007
196	CAPITAL ADEQUACY REGIME IN INDIA: AN OVERVIEW	MANDIRA SARMA YUKO NIKAIDO	JULY 2007
195	OECD AGRICULTURAL TRADE REFORMS IMPACT ON INDIA'S PRICES AND PRODUCERS WELFARE	SURABHI MITTAL	JULY 2007
194	IMPACT OF SPECIAL ECONOMIC ZONES ON EMPLOYMENT, POVERTY AND HUMAN DEVELOPMENT	ARADHNA AGGARWAL	MAY 2007
193	TECHNOLOGICAL CAPABILITY AS A DETERMINANT OF FDI INFLOWS: EVIDENCE FROM DEVELOPING ASIA & INDIA	AMITENDU PALIT SHOUNKIE NAWANI	APRIL 2007

About ICRIER

ICRIER, established in August 1981, has successfully completed its 25 years as an autonomous, policy-oriented, not-for-profit research institute. We have nurtured our cherished autonomy by establishing an endowment fund, income from which meets all our administration expenses. ICRIER's offices are located in the prime institutional complex of India Habitat Centre, New Delhi. The prime focus of all our work is to support India's interface with the global economy.

ICRIER's founding Chairman was Dr. K.B. Lall who led the organization from its inception from 1981 to 1992 when he handed over the Chairmanship to Mr. R.N. Malhotra (1992-1996). He was followed by Dr. I.G. Patel who remained Chairman from 1997 to 2005 until his demise in July 2005. ICRIER's current Chairperson is Dr. Isher Judge Ahluwalia.

Amongst ICRIER's founding member are: Dr. Manmohan Singh, Dr. C. Rangarjan, Dr. M.S. Swaminathan, Dr. Jagdish Bhagwati, Mr. Montek Singh Ahluwalia and Mr. Bharat Ram.

ICRIER conducts thematic research in the following six thrust areas:

- Trade, Openness, Restructuring and Competitiveness
- WTO Related Issues
- Regional and Bilateral Issues
- Financial Liberalization and Integration
- Macro-economic Management in an Open Economy
- Strategic Aspects of India's External Relations

In addition, ICRIER holds public policy workshops to bring together policy makers, academicians, Union Cabinet Ministers, senior industry representatives, Members of Parliament and Media persons to try and forge a consensus on issues of major policy interest. In the effort to better understand global developments and experiences of other economies which have bearing on India's policies and performance, ICRIER invites distinguished scholars and policy makers from around the world to deliver public lectures on economic themes of interest to contemporary India.

ICRIER's highly qualified core team of researchers includes several PhD's from reputed Indian and foreign universities. At present the team has 18 economists. The team is led by Dr. Rajiv Kumar, D.Phil in Economics from Oxford University.