

Structural Change and Manufacturing: Changing the Paradigm

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Structural changes underway in manufacturing are clearly not conducive to employment creation. This in turn affects structural patterns of employment, productivity and per capita income. There is much that the government can do, from promoting manufacturing value added to adopting a more active employment policy paradigm.

The industrial sector, it is generally agreed is a key engine of growth in the development process. Virtually all cases of high, rapid, and sustained economic growth in modern economic development have been associated with industrialisation, in particular growth in manufacturing production (Szirmai 2009).

There are powerful empirical and theoretical arguments in favour of manufacturing growth as the main engine of growth in economic development. Theoretically, in comparison to, the manufacturing sector offers a large scope of capital accumulation, economics of scale, and embodied and disembodies technological progress, than do agriculture and services. All of these are directly related to productivity. Any shift of labour and other resources from agriculture to manufacturing results in an immediate increase in overall productivity and income per capita. This is referred to as the structural change bonus (Lewis, 1954; Fei and Ranis, 1964; Fagerberg and Verspagen, 1999; Timmer and Szirmai, 2000; Ark, B. van, and M. Timmer, 2003; Temple and Woessman, 2006; Timmer and de Vries, 2007) and is a major source of economic growth in developing countries. Further, linkage and spill-over effects are also stronger in manufacturing than in agriculture or even services. This means, for instance, that employment growth in the manufacturing sector can positively influence productivity in other sectors as well, pushing the overall economy to a virtuous circle of high productivity and growth. Without such a structural change, the scope for sustained increase in productivity narrows and consequently, the growth potential of the economy remains limited. But of course, the increase in manufacturing shares in GDP alone is a necessary but not a sufficient condition to produce the desired changes in the sectoral structure of employment.

After growing at an impressive rate of 8 per cent over the period between 2003-04 and 2010-11, India's growth story has gone sour. In 2011-12 the growth rate slumped to 5 per cent. The picture for the current fiscal year continues to be grim with the RBI forecast for the current year at 5.8 per cent. The current fiscal year forecasts are not encouraging either. The government dismisses the slow down as temporary. But many others believe that the growth spurt of 2003-11 cannot be sustained due to structural weaknesses of the economy that have hampered its potential for sustained growth in the long run. Against that background, this essay explores whether the current structure of GDP and employment in terms of the manufacturing shares has posed a structural constraint to the economic growth of India. It also identifies the factors that could have influenced the process of manufacturing growth, and draws policy prescriptions. The analysis focuses on the high growth phase of 1993-94 to 2009-10.¹

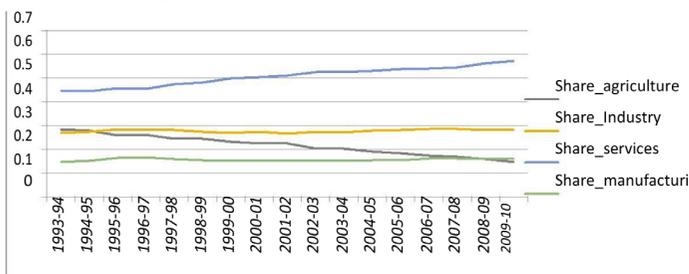
Economic Growth, Structural Change and Manufacturing: 1993-94 to 2009-10

The post 1991 period has witnessed an unprecedented growth in the Indian economy. The economy has grown at an average annual rate of almost 7 per cent during 1993-93 to 2009-10. This growth has been accompanied by an explosion in the growth of services. The service sector has grown at an impressive average rate of 8.6 per cent per annum between 1993-94 and 2009-10. As a result its share in GDP has increased from an average of 45% during 1993-1996 to 56 per cent by 2007-10. Growth in services has been matched by rapid erosion in the share of the agricultural sector. Industry has barely managed to retain its share in GDP at almost the same level. What is most striking from our perspective is the fact that the manufacturing sector has ushered into a phase of near stagnating share. The manufacturing growth rate of 7.5 per cent almost matched the overall GDP growth rate of 7 per cent during the time period under study. Clearly, the high-growth phase of 1993-94 to 2009-10 is not accompanied by acceleration in manufacturing. In a study on structural change in India, Aggarwal and Kumar (2012) find no causal relationship between industry and GDP growth rates during this period. At the state level, Gujarat, Himachal Pradesh, Punjab and Tamil Nadu are the only states that have shown a continuous increase in the share of manufacturing in their GSDP. Haryana, Maharashtra and Karnataka have above national average manufacturing share in GSDP but it has slowly been eroding over time. In all other states it has been lower than the All India average.

Interestingly, the surge in economic growth achieved during the period 1993-94 to 2009-10 was not accompanied even by a commensurate growth in employment. While GDP grew at an average annual rate of 7 per cent, employment growth rate had been a mere 1.5 per cent. In all, 90 million jobs were created over 16 years from 1993-94 to

¹ Employment estimates used for the analysis are based on the 'Usual Principal plus Subsidiary Status' for two NSS Rounds namely 1993-94 and 2009-10. According to Sundaram (2009) they remain the best option for employment planning and policy analysis (p.22).

Figure 1: Sectoral composition of GDP: 1993-94 to 2009-10



Source: Central Statistical Organisation

2009-10. In 1993-94, 246 workers contributed on average 10 million worth of value added; in 2009-10, only 103 workers could do that. In sectoral terms, the agricultural work force (WF) shrunk marginally. This means that the entire incremental WF was absorbed into industry and services. Interestingly, it was shared by both these sectors in equal proportion. Within industry, however, over 35 per cent of the incremental WF was absorbed into construction alone; in services, trade and hotels emerged as the major employer. These two sectors (construction, and trade and hotels) absorbed 63 per cent of the incremental work force and added a mere 26 per cent to the incremental GDP. Clearly, the growth patterns did not expand high productivity employment opportunities. In the absence of the capacity of the agricultural sector to absorb additional labour, low productivity sectors namely trade and hotels and construction absorbed the incremental workforce..

The rate of employment growth in manufacturing, a high productivity sector, was a mere 2.02 per cent. In the absolute terms, the sector offered over 40 million jobs in 1993-94; the number increased to over 53 million in 2009-10. Overall, almost 13 million jobs were added to this sector over the period of 16 years. During the same period, manufacturing value added increased more than three times from Rs 2221 billion to Rs 7134 billion. It means that 180 jobs contributed every 10 million worth of value added in 1993-94. In 2009-10, the number declined to a mere 74. In incremental terms however, manufacturing had been the third largest employer and absorbed 14.5 per cent of the incremental jobs. Since, this sector also added 16.5 per cent to the GDP growth, employment growth had been quite commensurate with the GDP growth.

In relative terms, the manufacturing sector seems to have a greater job creation potential than the service sector.

- Services accounted for 44 and 57 per cent of GDP in 1993-94 and 2009-10 respectively, while their share in employment remained 22 and 27% respectively. On the other hand, in manufacturing, nearly 15% of value added has been generated by 11 per cent of the workforce

- In services, the number of jobs created per 10 million of value added was 121 in 1998-94; it declined to 49 in 2009-10. In manufacturing these figures were 180 and 74 respectively.
- Finally, as stated above, nearly 16.5 per cent of the incremental manufacturing value added created 14 per cent of the incremental jobs. For the service sector, these figures were 64 and 50 per cent respectively.

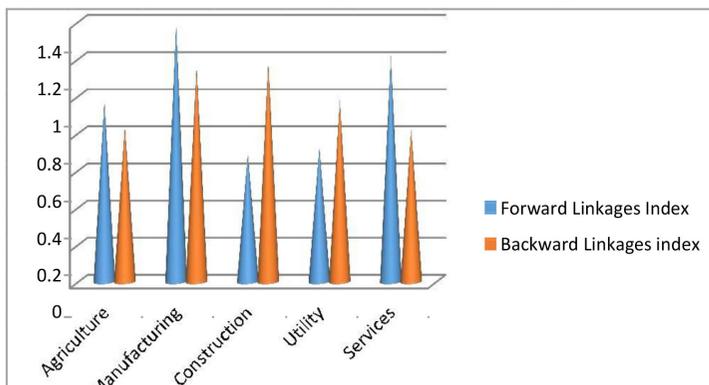
Table 1: Patterns of Employment Growth by Sector: 1993-94 and 2009-10

	Average annual employment growth rate	Share in Incremental employment	Share in incremental GDP	Share in employment 1993-94	Share in employment 2009-10	Share in GDP 1994-94	Share in GDP 2009-10
Agriculture, etc.	-0.02	-0.81	7.64	62.5	50.2	28.9	14.6
Mining & quarrying	0.45	0.24	1.83	0.8	0.7	3.4	2.3
Manufacturing	2.02	14.39	16.53	10.7	11.4	14.2	15.9
Services	3.42	50.32	63.72	22.1	27.6	44.1	57.3
Total	1.51	100	100	100.0	100.0	100.0	100.0

Source: Based on NSS rounds on Employment and Unemployment

It is well recognised that growth in manufacturing output also creates new jobs in other sectors of the economy, through indirect input-output linkages. Given the strong backward and forward linkages of the manufacturing sector with the rest of the economy, its employment generation potential is much larger than that of other sectors. Figure 2 shows that manufacturing is the sector with the strongest linkages in India. This implies that one job created in manufacturing will create more jobs in other sectors than one job created in any other part of the economy.

Figure 2: Forward and backward linkage indices of manufacturing in India: 2009-10



Source: Author's calculations based on the I-O Table 2009-10

Although incremental jobs are essentially created in the non-agricultural sectors, in particular, in industry and services, a large chunk of the labour force continues to be trapped in agriculture (Table 1). There has hardly been any release of labour from the agricultural sector even though its contribution to GDP remained at a low of 14.6 per cent. On the other hand, the manufacturing sector added about 16 per cent to GDP with a workforce of 11 per cent of the total indicating the underlying potential of this sector.

Why has Manufacturing Employment been Sluggish?

Why has manufacturing growth failed to attract agricultural WF? Manufacturing growth has not been high enough to create a large number of jobs.. Manufacturing employment is directly related to the growth in manufacturing value added. A panel data analysis of 17 major states over the selected period, shows a positive and significant relationship between the share of manufacturing employment and the growth of manufacturing value added. (The coefficient even turns out to be greater than 1). Further, the share of employment in manufacturing was also found to be positively related with that in manufacturing value added. So an above average growth in manufacturing could be instrumental in the release of labour from agriculture.

The average performance of manufacturing is due to serious structural constraints of the economy. In developing countries industrial growth can be sustained only if it is intrinsically tied to the dynamics of its production structures in terms of enhanced productivity, innovation, entrepreneurship and competitiveness. But the foundation of India's manufacturing sector economy remains fragile for these crucial economic drivers. Table 2 provides India's global ranking in selected international indices that capture the contextual features of innovation, competitiveness and entrepreneurship across countries. India consistently ranks poor in nearly every case.

Table 2: Patterns of Employment Growth by Sector: 1993-94 and 2009-10

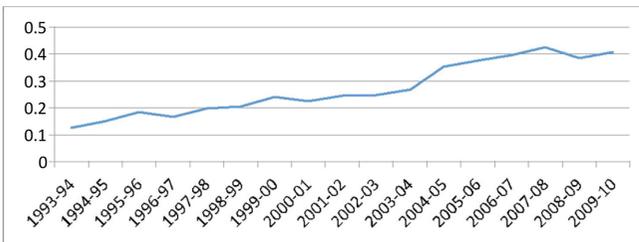
Index	Top score and country	India's score	India's rank	Total number of countries	Agency
Global Innovation index	66.6 Switzerland	36.2	66	142	Cornell University, INSEAD, and the World Intellectual Property Organization
Global competitiveness index	5.67 Switzerland	4.28	60	152	World Economic Forum
Knowledge economy index	9.43 (Sweden)	3.06	100	146	World Bank
Entrepreneurship index	Hong Kong	0.8	89	118	Centre for Entrepreneurship and Public Policy, George Mason University
Entrepreneurship	27.3 Hong Kong	.09	86	92	World Bank

Source: Relevant reports

Economic reforms and a change in foreign direct investment policy that attracts global investment cannot sustain long term growth in manufacturing. In an analysis of the growth experience of 16 countries, Lazonick (2011) argues that investment in education and foreign direct investment did make important contributions to growth, but they were insufficient without entrepreneurial activity within the domestic economy. In the absence of strategic government intervention in promoting innovation and entrepreneurship, growth in particular in the manufacturing sector cannot be accelerated. Further, structural factors, such as the unfavorable business environment, weakening governance, and slower government project approvals are also found to have depressed manufacturing investment (Purfield 2006, Topalova 2008; Mohommod, 2010, Tokuoka 2012). Costs of doing business in India remain among the highest in the world. Another reason why growth fails to generate significant employment can also be found in the trajectory of the structural changes that the manufacturing sector is undergoing.

- First, the manufacturing sector is experiencing rapid technological advances. Labour saving techniques and mechanisation are increasingly becoming substitutes for human labour. While employment generated per unit of GDP has been declining, capital invested per unit has been increasing sharply (Figure 3).

Figure 3: Capital invested per unit of GDP: 1993-94 to 2009-10

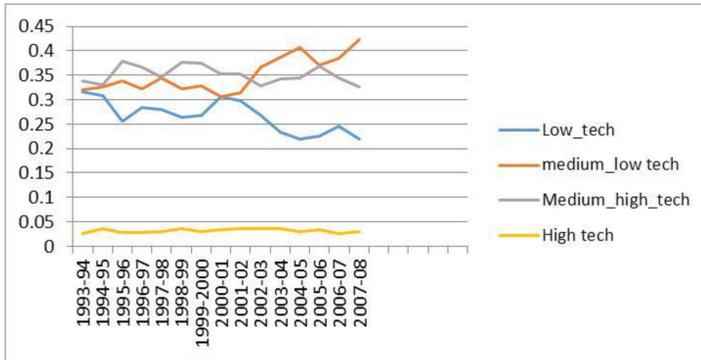


Source: Central Statistical Organisation

- Second, the composition of the manufacturing sector has changed. The low tech segment that witnessed steady growth in the 1980s and early 1990s but stagnated in later, although there has been some recovery during the boom period of 2003-07. High tech industries, which had been the fastest growing segment of the manufacturing industry prior to 1990 have also turned into the slowest growing ones (Aggarwal and Kumar 2012). While both high and low-tech industries show declining trends, comparative advantages have begun to emerge in medium tech industries in particular the medium low tech industries. These industries have grown sharply during the boom period of the 2000s with medium-low tech industries growing faster than the medium-high tech ones (Figure 4). Medium low tech industries driven by petroleum and steel products rose and captured over

40 per cent of the total share in manufacturing. Almost three fourth of the Indian manufacturing sector in terms of value addition is currently accounted for by the medium tech segment, both medium low and medium-high tech. These are scale-based capital intensive industries. While these industries have shown significant growth rates they have had a limited impact on employment.

Figure 4: Composition of the manufacturing sector of India by technology intensity: 1993-94 to 2007-08



Source: Central Statistical Organisation

- Third, since the early 1990s, the policy focus shifted from SMEs to large industrialisation in the country. The distribution of factory sector employment by size class of employment shows that between 2008-09 and 2010-11, total employment in the small sector² increased at the rate of 11.3 per cent while that in the large sector grew at 12.9 per cent. Over the three years, both employment and value added grew more rapidly in the large sector. This growth impacts on its share in total manufacturing value added and employment.
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Table 3 shows that the states that have increased their GSDP share in manufacturing have witnessed no commensurate increase in the share of manufacturing employment. The pooled data of 17 states for four NSS rounds shows no positive

² Small enterprises represent the factories with less than 200 workers; the large enterprises cover all those employing 200 or more workers.

relationship between the growth of manufacturing GSDP and manufacturing jobs. Only eight of the 17 states, could increase their manufacturing share in GSDP. Only three, Haryana, Punjab and UP showed any increase in manufacturing employment. These states have focused primarily on SMEs and cluster development. Gujarat and Tamil Nadu that have promoted large industrialisation, have in fact experienced retrogression in the structural distribution of their manufacturing work force.

Table 3: Share of Manufacturing in GSDP and Employment by State: 1993-94 and 2009-10

States	Mfg share in GSDP 1993-94	Mfg share in GSDP200910	Mfg share in employment 1993-94	Mfg share in employment 2009-10	Change in GSDP share	Change in employment share
Andhra Pradesh	10.9	12.4	9.2	11.5	1.5	2.2
Assam	19.0	15.1	3.1	4.3	-3.9	1.3
Bihar	7.4	5.5	5.0	6.1	-1.9	1.0
Gujarat	24.4	30.7	16.3	14.2	6.2	-2.1
Haryana	19.3	19.4	10.1	17.1	0.1	6.9
Himachal Pradesh	7.3	17.2	3.9	4.5	10.0	0.6
Karnataka	17.1	17.9	10.9	10.5	0.8	-0.4
Kerala	9.9	7.6	14.9	13.0	-2.3	-2.0
Madhya Pradesh	10.4	13.5	5.7	6.4	3.2	0.7
Maharashtra	24.0	21.2	11.5	11.7	-2.8	0.2
Orissa	8.1	14.8	7.9	8.6	6.6	0.7
Punjab	14.8	20.1	11.3	14.5	5.3	3.2
Rajasthan	10.3	15.2	6.2	5.4	4.9	-0.9
Tamil Nadu	22.6	21.6	18.3	18.4	-1.0	0.1
Uttar Pradesh	12.8	14.1	9.5	11.2	1.3	1.7
West Bengal	10.2	11.1	19.1	17.2	0.9	-1.9
All India	14.6	16.0	10.7	11.4	1.4	0.7

Source: Relevant reports

- Fourth, the informalisation of employment in low-productivity sectors also affected employment growth. As the *World Development Report 2013* argues, the labour force in many developing economies is not moving from traditional activities such as agriculture into manufacturing. Increasingly, workers are moving into traditional service sectors, that have low productivity features as well as informality and casual nature of jobs. New entrants to the labour market especially in rural and informal urban settings cannot afford the luxury of not working; they are registered as employed if they work at least one hour a week, in any casual, off-contract informal kind of activities. Low productivity and poor earnings, in turn, impede growth of consumption and investments that could be a catalyst for job creation.

- Finally, employment-protection measures might be providing a disincentive to create jobs (Besley and Burgess 2004). For instance, continental European countries have very strict laws against firing employees and hiring temporary workers. Conceivably, employers in those countries would have less flexibility to adjust their workforces in the face of a recession. Although this might mitigate an increase in the unemployment rate during bad times, firms that anticipate the firing restriction might hesitate to hire in the first place, even in good times; this behavior would increase unemployment by lowering hiring (job-finding) rates.

Clearly, the structural constraints in the manufacturing sector have moderated its growth from the supply side. Further, the structural changes manufacturing is undergoing, and likely to undergo, do not seem to be conducive to employment creation. This in turn affects structural patterns of employment, productivity and per capital income.

Policy Recommendations

Promote manufacturing value added

Stagnation in the share of manufacturing sector in a country's GDP at low levels of income is a cause for serious concern. Belying the belief in service led growth, recent research by eminent development economists has shown that manufacturing is central to not only a nation's economy but also its democracy. A weak manufacturing sector may ultimately threaten the sustainability of a country's growth process.

Concerned about the stagnant and low share of manufacturing, government, in line with a global trend, has launched several initiatives to promote manufacturing clusters over the past two decades. These are for instance: growth centres, food parks, textile parks, SEZs, and industrial parks. But, all of them have been languishing due to indecision, delays and policy reversals. If growth is to be sustained the country will have to adopt a well-defined development strategy that can address the issues being faced by the manufacturing sector. This will have an integrated framework to promote entrepreneurship and innovation, improve business climate and restore investors' confidence. In a recent empirical study, Tokuoka (2012) found that improving the business environment by reducing costs of doing business, improving financial access, and developing infrastructure, could stimulate corporate investment in India.

Shift from passive to active employment policy paradigm

Increase employability by matching demand with supply of labour: An employment survey indicates that not more than 15 per cent of University Graduates of General Education and 25-30 per cent of Technical Education are fit for employment.³ To address the issue of employability, the education system needs to be ready for changes in its

³ 'Innovation for Quality and Relevance—The Higher Education Summit 2007', Federation of Indian Chambers of Commerce and Industry, New Delhi reported in the India Labour Report, 2012 by Team Lease Services & Indian Institute of Job Training.

organizational structure, policies, teaching-learning processes and the type of academic offerings. It needs also to be geared to life-long learning by being flexible in terms of entry, exit and re-entry with a greater focus on skill development. Universities need to be more than just the centres of knowledge transmission; they need to prepare a skilled work force ready to be absorbed in the market.

Connect supply with demand for labour: Data management systems of Employment Exchanges (EEs) have to be regularly overhauled and strengthened. They need to acquire a new-generation look, providing all employment-related services online throughout the state. EE's across states need to be interconnected, as a step towards creating a 'National Labour Market'.

The government will also need to encourage, regulate and standardise the development of job agencies run by non-governmental entities. There will be clear guidelines on their operations to avoid abuse and frauds. Information related to registered private companies will be made available online on the government website.

Increase employment opportunities: There is an emerging consensus among policy makers and development economists worldwide that high growth and young firms (gazelle) are innovation engines and vital ingredients in achieving economic acceleration and job creation. According to the Bureau of Labor Statistics, just 80,000 high-growth start-ups created 34 per cent of all private-sector jobs in a recent three-year period (see for instance, Haltiwanger et al 2010). They are responsible for between 60-70 per cent net job creation in OECD countries (OECD, 2006). OECD countries have been launching many policies and initiatives to support existing high-growth enterprises as well as to enhance their emergence. These policies are aimed at creating conditions through which small firms can be created and thrive. There is a serious gap in the policy for young high growth firms in India. A dedicated policy with a focus on start-ups and other high growth small and medium enterprises is an urgent need.

Ensure social security net for labour: To address labour market rigidities, new models of labour management systems that combine flexibility in labor market with income security of workers need to be developed and assistance provided for retraining and relocation. The Flexicurity system of Denmark has been recognised as one of the best practices in labour management. It has been adapted by many countries to their local conditions. It is a leitmotiv of the European employment strategy. It entails a 'golden triangle' with "... three principles: Flexibility in the labour market combined with Social security; an active labour market policy, with rights and obligations for the unemployed". This system may be adapted to the Indian conditions.

Further, the roles of trade unions and workers' representatives should also change. They need to take more 'responsibility' for the upgradation of skills of workers on a

⁴ In the US, small firms accounted for 65 percent (or 9.8 million) of the 15 million net new jobs created between 1993 and 2009. <http://www.sba.gov/sites/default/files/sbfaq.pdf>

continuous basis and ensure competitiveness of the firms. Besides, they need to focus on better living environments for the labour which would contribute to higher productivity. Among other things, they should enter into ‘alliances’ with management such that they can bargain for higher wages for labour without compromising on competitiveness of the company. The labour policy should clearly define the role of the labour unions in this regard. Germany offers a good model for the analysis and adaptation.

The gap between management and labour needs to be bridged through participation of management in labour unions and vice versa. This will act as a trust building exercise between the two and will ensure better understanding of the problems that each faces in the process. This practice is prevalent in many countries.

Unfortunately, ‘economic liberalisation’ is being treated as a panacea for the country’s structural weaknesses. The broad agenda for policy debate on development has been almost completely replaced with the narrow issue of the means and the speed with which liberalisation ought to be introduced in the economy. This type of policy making needs to change now if the country is to achieve the objective of sustained economic growth.

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