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STAGNANT MANUFACTURING

Governance and Policy Slack

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Stagnant Manufacturing: Governance and Policy Slack

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We are proud to be associating with the Forum for Global Knowledge Sharing on this initiative.

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Stagnant Manufacturing: Governance and Policy Slack

Most, if not all, countries during the phase of rapid economic growth underwent structural transformations. During the growth process, the share of manufacturing sector in the national income rapidly increased and the share of agriculture declined. This was also reflected in the employment scenario. The share of employment in manufacturing increased. Thus manufacturing acted as the main engine of growth. This was true for developed European economies, the United States and Japan. The same phenomenon was witnessed in rapidly developing Asian countries like China, South Korea, and several ASEAN countries. In these countries the share of the manufacturing sector stabilised when it reached about 35 per cent of the national income. In these countries manufacturing also dominated the exports and foreign direct investment (FDI) inflows. However, in the case of India, the share of the manufacturing sector has stagnated even before it reached 20 per cent of national income. Currently it is only about 16 to 17 per cent of the national income. This prompted some policy makers to argue that India need not follow the international experience and the manufacturing sector need not be the engine of growth for India. Instead, the service sector could be the engine of growth. The papers included in this volume refute this view and clearly show the manufacturing sector to be the engine of growth for India. Without a rapid growth of the manufacturing sector employment and exports also will not grow. At the current stage of Indian development growth of the national income cannot be sustained by the service sector. Hence, India should concentrate on its manufacturing sector, create a proper investment climate and remove the obstacles for manufacturing growth. The papers also show that the main obstacle for the growth of the manufacturing sector is appalling infrastructure conditions - both governance and physical.

The first essay by Aradhna Aggarwal deals with the decline of manufacturing in all its aspects, including employment, inter-state differences and technological change. This provides a broad canvass for the other papers. She argues that the slow growth of manufacturing has also adversely affected the growth of employment. She blames structural factors like unfavourable business environment, weakening governance, and slower government project approvals as reasons for manufacturing stagnation. For improving the growth of employment she advocates flexibility in labour market combined with social security.

The next essay deals with the main cause of decline, namely, poor investment climate. It argues that in the current global regime the determinants of Foreign Direct Investment (FDI) and domestic investment are more or less the same. Under these conditions poor business environment will affect both domestic investments in manufacturing and FDI. It attributes poor investment climate to bad and indifferent governance and poor infrastructure. It advocates improvements in both physical infrastructures like roads, electricity, ports etc, and governance infrastructure like rule of law, violence, regulatory burden, government effectiveness, corruption and accountability. In addition education and health are also important to attract investment. The essay shows that as a result of high levels of corruption and poor governance FDI inflows in manufacturing has come down sharply. Furthermore, FDI outflows from India in manufacturing have increased rapidly. To improve governance and fight corruption, the paper advocates discouraging cash transaction, including cash holdings beyond a limit and encouraging bank (including credit card) transactions.

The following two essays deal with employment. Biswanath Goldar advocates the creation of a large number of industrial jobs through rapid growth of the manufacturing sector. This should also be further supported by restructuring of the manufacturing sector towards more labour intensive industries. He also shows that service sector employment is biased in favour of highly skilled workers. Hence, it cannot support employment of unskilled workers. His paper shows that growth rate of manufacturing, employment and exports are closely related. During 2008-09 when growth rate of manufacturing was negative growth rate of exports were also negative. He also blames poor investment climate due to bad governance and infrastructure for the sad state of affairs.

Arup Mitra argues that growth alone is not sufficient to achieve major improvements in economic and social well being of the poorer sections. Employment growth at higher than subsistence wages is crucial for poverty reduction and this will not be achieved without rapid industrialisation. Even in the unorganised sector employment has not been growing. In recent period (2005–2011) employment growth in the unorganised (informal) manufacturing sector has been mostly negative. Due to lack of modernisation these enterprises have not been able to grow in the export sector. They are also not able to enter the high value added sector. To solve this problem Arup Mitra advocates the creation of national manufacturing investment zones or clustering of manufacturing units. He also advocates the creation of industrial townships with world class infrastructure.

In the next essay Vinish Kathuria emphasises the importance of the informal sector and argues that for both manufacturing and services the informal sector has been the major employer. It contributed to 78 per cent of employment in services and 84 per cent of

employment in manufacturing. The author discusses in detail the role of the informal sector. The unique feature of the informal sector is the constant change or what the author calls churning. While new firms enter, several old firms exit. Most of these enterprises are located in rural areas. However, their share in output is low and declining. Recent years have witnessed growth of smaller units that are low in productivity and are non viable. This, he calls a manifestation of distress aided by decline in formal manufacturing. Thus decline in formal manufacturing have adverse effect on the informal sector.

Any discussion on the informal sector ought to lead to an examination of the micro and small enterprises. Uma Sankaran and K.J. Joseph analyse in detail the functioning of micro, small and medium enterprises. These enterprises contribute to 45 per cent of manufactured output and 40 per cent of Indian exports. It is important to make them globally competitive and help them to participate in the global production network. This cannot be achieved without active state participation. Sankaran and Joseph are against the state taking its hands off from the industrial steering wheel and allowing a free hand to the market forces. They discuss the role of national innovation system and its role in making the small scale sector globally competitive. It is also important to integrate the innovation system with trade and investment policies,

The next two contributions by Rashmi Banga and Kalirajan and Von Son Nguyen concentrate on external sectors. Banga acknowledges the crucial role of micro and small enterprises in employment and exports and links their low access to technology and productivity to the stagnation in exports and manufacturing. While China rapidly modernised its small enterprises and made them globally competitive, India used the protection and reservations instruments to keep them alive. This policy prevented the small enterprises from actively participating in the global value chain. She also brings to light the dual structure within the manufacturing sector, namely, the domination of small and large firms and the absence of the middle – medium sized firms. In the growing economies of Asia it is the middle sized firms that grew fast and propelled growth. The absence of the middle has hurt the exports and the import of manufactured products has increased more rapidly than exports. Most of the imports of manufactured goods have been from the middle sized Chinese and other Asian firms. As a result of this dual structure India has not been able to enter the global value chain.

Kalirajan and Nguyen (Chapter 9) discuss the huge potential in exporting environmentally friendly goods for which there is a huge global demand. There are 153 goods that are likely to secure zero tariffs. Several Asian countries have already targeted these goods to promote exports. They suggest policy changes that would enable India to take advantage of this huge and growing market. They have developed a model to measure

the gap between potential exports and actual exports in these environmentally friendly goods market. They define potential exports as the maximum possible exports that can be achieved in contrast to the average exports from India. They call the ratio of actual exports to potential exports as 'export efficiency'. Their results show that the Indian governance constraints have had a huge negative effect on the exports of environmentally friendly goods.

Finally Bino Paul analyses wages and productivity relationships. Mere employment generation is not enough. We need employment with good wages. In this context his paper discusses the determinants of wages. He shows the enterprises are employing capital intensive, productivity enhancing and labour saving technologies. Hence, in the organised Indian manufacturing sector wages are not increasing in line with productivity increases. In the current technological scenario, it is not possible to increase wages unless there is a substantial increase in the skill content of the labour force. In other words there is only bleak future for workers with little or no education.

The last two essays are slightly technical in nature. This is because they deal with specific issues and have developed appropriate models to discuss them.

In sum, papers included in this volume cover most of the aspects of the manufacturing sector in India. The authors come from diverse backgrounds and belong to different institutions and cities. Despite this there is unanimity on the following points. Indian manufacturing sector has stagnated and this has adversely affected the growth of employment, investment (both domestic and foreign), and exports. This has created a huge gap between Indian imports and exports leading to a foreign exchange crisis. The growth of Indian national income cannot be sustained without a vibrant and active manufacturing sector. The main cause of the decline in manufacturing is due to governance and policy slack.

N S Siddharthan

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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]

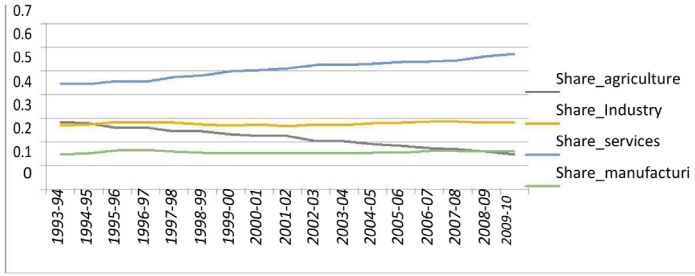
Economic Growth, Structural Change and Manufacturing: 1993-94 to 2009-10

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.

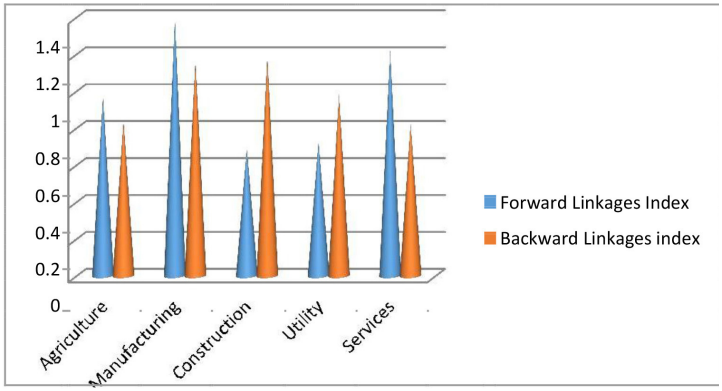
Table 1: Patterns of Employment Growth by Sector: 1993-94 and 2009-10

	Average annual employ-ment growth rate	Share in Incremetal emplo-ment	Share in incre-ment al GDP	Share in employm ent 1993-94	Share in employm ent 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

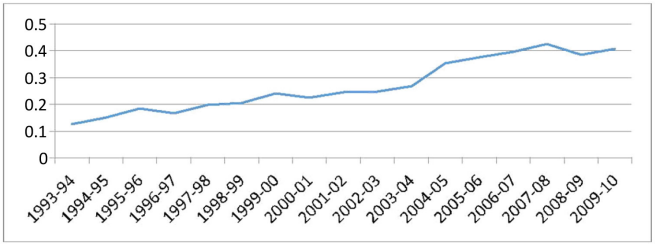
Index	Top score and country	India's score	India's rank	Total number of countries	Agency
Global Innovation index	66.6 Switzerland	36.2	66	142	Cornell University, INSEAD, and the World Intellectual Property Organization
Global competitiveness index	5.67 Switzerland	4.28	60	152	World Economic Forum
Knowledge 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

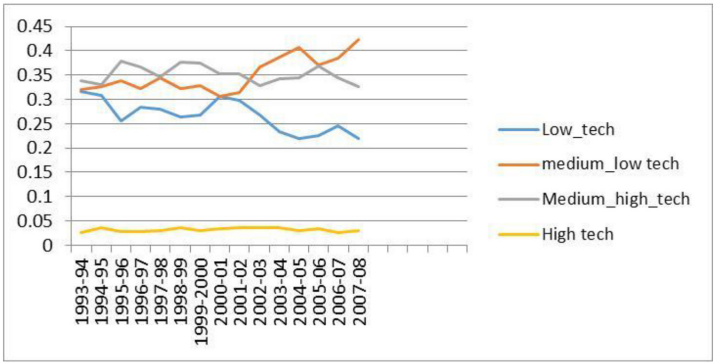


Source: Central Statistical Organisation

- 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 sector[2] 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.

  Table 3 shows that the states that have increased their GSDP share in manufacturing have witnesses no commensurate increase in the share of manufacturing employment. The pooled data of 17 states for four NSS rounds shows no positive 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.

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

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 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.

[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.

***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.EEs 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)[4]. 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 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.

[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

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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What Ails Manufacturing?

Poor Investment Climate and Bad Governance

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A high growth rate for the Indian economy cannot be sustained without a vibrant and growing manufacturing sector. A policy aimed at GDP growth based mainly on attracting investment in the services sector will not succeed. Moreover, a thriving manufacturing sector is vital for employment generation. Under these circumstances, reforms should be aimed at good governance and transparent and time bound decision-making.

The development experience of most countries, including Europe and Japan, shows manufacturing to be the main engine of growth. During periods of sustained rapid economic growth, the share of agriculture in national income and the share of agricultural employment in total employment decreases. The space vacated by agriculture is mainly occupied by manufacturing. The share of manufacturing in national income increases rapidly and then stabilises after reaching about 30 per cent. After this the service sector grows filling the gap left by manufacturing..

In the recent past the newly emerging high growth economies like China and East Asian countries have also been following the international trend. For China, South Korea and some East Asian countries the share of the manufacturing sector in the national income increased rapidly and stabilised only after it crossed 35 per cent. In these countries exports have also been led by manufacturing exports.

For India, the share of the manufacturing sector stopped growing even before it touched 20 per cent of the national income. India's growth has been mainly led by the growth in the service sector. This has prompted some to conclude that India is different from the rest of the world and the Indian growth can be sustained by the growth of the service sector. Several econometric studies show that manufacturing continues to be the engine of growth in India; growth led by services is not sustainable.

But does the growth of the service sector in India reflect actual growth? There are some peculiarities in the way service sector growth is reckoned. It is important to note that most advocates of services have high end services like banking, insurance and

information technology in mind. These services are mostly in the organised sector and they do not constitute the bulk of the growing services. Furthermore, salaries paid by the governments (both centre and states) to their employees are also included under the service sector. This reflects in a higher growth of the service sector whenever the pay commission awards a higher pay for government employees. Thanks to this strange method of accounting, the growth of the service sector, in this case, does not reflect the actual growth. The unorganised sector occupies a prominent position in the service sector. This sector mainly constitute self employed poor persons who cannot afford to be unemployed, and who will, to avoid starvation, to self employment with low incomes. Clearly, the growth of this sector does not constitute development or prosperity. In fact, it reflects the opposite.

As some of the econometric studies show (Chakravarty and Mitra, 2009, Kathuria and Rajesh Raj 2013), even during the period of rapid growth of the service sector in India, it was the manufacturing sector that emerged as the main engine of growth. In particular, Kathuria and Rajesh Raj (2013) based on a study of several Indian States show that an incremental increase in the growth of the manufacturing sector leads to a substantial increase in the growth of income. The statistical results clearly showed that high growth of income through the growth of the service sector is not sustainable.

Liberalisation and Corporate Sector

India introduced internal deregulation in 1985 and a series of external liberalisation measures in early 1990s. During 1985, the Government of India introduced important policy changes aimed at improving the competitiveness and performance of the Indian firms. These reforms substantially deregulated the Indian industrial licensing system, allowed expansion of capacities without prior permission, liberalised the procedures for the import of capital goods and arm's length purchase of technology. This resulted in a substantial increase in investments, imports, and import of technology across all industries. The early 1990s saw the introduction of several external liberalisation measures like current account convertibility of the rupee, drastic reduction in import tariffs, liberalisation of FDI inflows and outflows. Several research studies show that these resulted in notable changes in the structure, conduct and performance of the Indian corporate sector (See Pandit and Siddharthan 1998 and 2009, Siddharthan and Pandit 1998). During the license and permit Raj of pre-1985 period, a prominent part of the corporate sector was owned and managed by large business houses belonging to traditional business families. After liberalisation new enterprises started by young professional entrepreneurs with technology background entered the corporate sector and achieved eminence. Few of these successful entrepreneurs came from business families. In the earlier regime the main entry barrier was the requirement of industrial licensing. During the 1990s the main prerequisite for success became technology and other intangible assets.

In recent years the investment climate has deteriorated and the share of manufacturing has stagnated. Before discussing the causes of stagnation of the manufacturing sector, it would be useful to examine the current global investment and trade regime and its implications for the manufacturing sector.

WTO Regime and Manufacturing Sector

The emergence of the World Trade Organisation (WTO) regime in 1995 has fundamentally changed the nature of manufacturing and the characteristics of the foreign direct investments (FDI) both inflows and outflows. The WTO regime drastically reduced import duties, abolished quotas and quantitative restrictions, discouraged local procurements and the favouring of local firms by the government agencies, and liberalised FDI inflows and outflows. Improved intellectual property protection has encouraged the licensing of technology.

FDI inflows in the current WTO regime are not of the tariff jumping type. While in the earlier regime foreign investments were mainly market seeking investments, in the current regime they were principally efficiency seeking investments. Foreign firms would invest in India if they considered India efficient for manufacturing purposes. Likewise Indian firms would not invest in India, but instead, would invest in other countries and import the manufactured goods into India

The share of manufacturing in FDI inflows was more that 60% in early 2000; it came down to about 40% in 2005 and further down to 20% in 2008 (Rao and Dhar 2011). So the decline of manufacturing sector is reflected in the FDI inflows. Currently 'construction and real estate' attracts as much FDI as manufacturing and they come mostly from tax heavens.

Poor investment climate is also reflected in FDI outflows from India. A substantial part of FDI outflow from India is in manufacturing. Medium sized enterprises dominate investments abroad and this is due to a combination of push and pulls factors. They have been setting-up manufacturing units in Asian countries where the investment climate is better, and importing the goods back to India.

Growth of Manufacturing: Two Sets of Constraints

Two sets of factors stand in the way of the growth of manufacturing in India. They also inhibit FDI inflows and encourage FDI outflows from India. They are (1) poor physical infrastructure and (2) bad governance. These two reinforce one another. It is common knowledge that Indian physical infrastructure like roads, railways, ports and electricity are bad compared to our Asian competitors like China and East Asian countries.

The deficiencies in Indian infrastructure are not merely because of insufficient investment in these sectors. It is also due to corruption in high places. It is widely believed and reported in the media that only a fraction of the allotted money is spent on the laying of roads or other targeted projects. In the case of electricity coal blocks were given to

firms at concessional rates on the condition that they would supply coal to electricity generating units. Several of these coal blocks have yet to fulfil their promises and supply coal. The result is a huge electricity shortage resulting in power cuts and power holidays for industrial units. Most large units have gone in for captive electricity plants that have pushed up the costs and made our manufactures uncompetitive.

The situation is worse for smaller enterprises that cannot even afford the captive electricity generation units. Likewise the turnaround time for ships in Indian ports compares very unfavourably with other Asian countries. Further, most Indian ports do not have X-ray machines for containers resulting in time consuming physical examination of the contents of the containers.

These and other factors make manufacturing expensive and uncompetitive. It is hardly surprising that India's rank is 59 out of 144 countries (2012-13) in the global competition index and compares very poorly with most high growth Asian economies.

The World Bank (Batra, Kaufmann and Stone 2003)'s survey of investment climate around the world captures companies perceptions of key constraints in the business environment – perceptions that shape operational and investment decisions – as well as several quantitative indices of companies experiences. The survey collected information on companies' perceptions on several variables representing corruption, judiciary, financing, infrastructure, policy instability, inflation, exchange rates, street crime, organised crime, anticompetitive policies and fiscal and taxation policies. Perceptions on India were not very different from those of other Asian countries except in the case of corruption, infrastructure, policy instability, customs delays, roads, electricity and water. In other words, what separated India from its Asian competitors (including China) were governance indicators. It was not fiscal and monetary policies that have placed India at a disadvantage but bad governance.

Role of Governance Factors

To better understand the determinants of investment climate in manufacturing let's analyse the relative importance of fiscal incentives and governance factors. In a study analysing FDI based on inflows from 12 source and 45 host countries, Wei (2000) found that corruption is as much if not more important in inhibiting FDI inflows than the increase in tax rates. Corruption index turned out to be important even after controlling for other determinants like GDP, population, political stability, wages and other control variables. The paper concludes, "...a one-step increase in corruption level is equivalent to a rise in tax rate by 7.5 percentage points, other things equal. An increase in corruption level from that of Singapore to that of Mexico has the same negative effect on inward foreign investment as raising the tax rate over 50 percentage points".

Governance infrastructure does not deal only with corruption. It consists of several other indicators like rule of law, political instability, violence, regulatory burden, government

effectiveness, corruption and accountability. Globerman, and Shapiro (2002) considered all these governance indicators and analysed inter country FDI inflows and found governance indicators highly significant. In addition they also found education index important. In my view, education index also reflects good governance.

Studies show that corrupt countries not only receive less FDI but the investments they receive are mostly from other corrupt countries. Cuervo-Cazurra (2006), clearly show that corrupt countries (corruption indicators taken from World Bank publications) mainly receive funds from other corrupt countries that have neither technology nor other intangible assets to transfer. The result holds good even after taking into account all the standard determinants of FDI.

The study takes into account the following control variables: Population, distance between the two countries, landlocked countries, island nations, common border, common language, common colony, ever colonial line, restrictions on trade, and restrictions on FDI. The investment flows are merely parking of money from tax heavens and other such countries placed in speculative ventures in other corrupt countries. They normally go to real estates and construction. In India only 10 percent of FDI into real estate came from technology rich developed countries. More than 90 percent came from tax heavens and other such countries.

Thus in recent times, industrial climate changed drastically in India due to bad governance and all pervading corruption. In the last few years, major scams have broken out in resources sectors that are mainly owned by the government — like real estate, mining and ores, and spectrum. A number of individuals who have obtained government permission to enter and exploit these resource sectors have amassed billions of rupees. In other words, under the existing business environment, the path to amass wealth, it would appear, is not through manufacturing but through exploitation of resources under government ownership.

Mergers and Acquisitions

After the WTO regime came into existence, there has been a huge spurt in cross border and domestic mergers and acquisitions. As already discussed, in the pre-WTO regime, most of the FDI was of the market-seeking type. The objective was to jump import tariffs and sell in the host country markets. The WTO regime drastically reduced tariff rates, and abolished import quotas and encouraged exports rather than market seeking investments. Most FDI now is of an efficiency seeking type. This necessitated a drastic change in the location of industries. It was no more necessary to produce all products in all countries. Production in a particular country depended on efficiency and location advantages.

This new regime resulted in a huge wave of mergers and acquisitions. In the post-2000 era most FDI went into mergers and acquisitions and not for green field investments.

India also witnessed rapid growth in mergers and acquisitions during this period. Consequent to parent companies merging in Europe and the US, the Indian subsidiaries also automatically merged. Furthermore, Indian companies also merged with other Indian companies to achieve size advantages to face global competition.

Not all mergers and acquisitions helped the companies to be globally competitive. Impact of mergers depended on two factors: (1) mergers promoted by political contacts and, (2) level of corruption in the host and home countries. Brockman, Rui and Zou (2013), based on a sample across 22 countries found political connections played a significant role in the post merger performance of the companies. In countries with a good legal system and low levels of corruption politically connected mergers did not perform well. However, in highly corrupt countries they outperformed others. Political connections in countries with weak institutional framework can give companies certain advantages. Governments could relax standards and allow them to merge. Government could also give them sensitive information about other firms. They could also obtain preferential access to bank finances. None of these factors contribute to efficiency and global competitiveness. Thus efficient companies from corrupt countries become victims of global competition even when it comes to mergers and acquisitions.

Policy Imperatives

There is enough evidence from several research studies to show that bad governance, and in particular corruption, has been the most important factor inhibiting the growth of the manufacturing sector. I discussed the policy imperatives in my op-ed page article in the Hindu (Siddharthan 2012). In what follows I propose to reproduce the points I made there. Corruption mainly takes place where important discretionary powers are vested with the decision maker and where rules are not clear-cut and decision making is not transparent. The way out is to reform the decision-making process by making it transparent and rule-based and by drastically reducing the discretionary powers of officials. So far, despite brave declarations of intent, no serious attempt has been made in this direction of administrative reforms.

In addition to administrative reforms, the government should also introduce rules and laws to drastically discourage cash transactions and cash holdings. Corruption cannot be reduced so long as cash transactions dominate. Newspapers frequently report police and income tax raids and the discovery of huge amounts of cash kept at home, offices and lockers. In this context, it is vital to introduce laws that discourage cash transactions. Drastic situations need drastic remedies. To discourage cash transactions, the government could place a limit on cash transactions. For example, the government could declare that any transaction, say, above Rs. 5000 should be a bank or credit card transaction and not a cash transaction. This would bring huge expenditures on items like consumer durables, hotels and resorts under bank transactions and increase

accountability. Likewise, the government could place a limit to cash holdings at homes, offices and lockers. The limit could be as low as one or two lakh rupees

To conclude, a high growth rate for the Indian economy cannot be sustained without a vibrant and growing manufacturing sector. A policy aimed at GDP growth based mainly on attracting investment in the services sector will not succeed. Moreover, a thriving manufacturing sector is vital for employment generation. Under these circumstances, reforms should be aimed at good governance, transparent and time bound decision-making, reduction of currency transactions and holdings, and the rule of law.

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Growth rates in manufacturing and exports

Note: Computed from IIP-manufacturing data taken from the website of Central Statistical Office (Government of India) and data on India's exports expressed in US$ taken from the website of the Reserve Bank of India (RBI).

Source: Creating Jobs in Manufacturing / Bishwanath Goldar

Creating Jobs in Manufacturing

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For the 70-80 million youth who will enter the labour market in the next ten years, the creation of a large number of industrial jobs is important. For this, the stagnation in the sector over the last two years has to be reversed. But even if a high rate of growth of manufacturing does add to a large number of jobs, this may not fully meet the aspirations of the youth, since a substantial part of the industrial jobs may turn out to be rather low paying with limited or no benefits. There is econometric evidence to show that labour markets reforms will help in boosting the growth rate in manufacturing employment as well as lower the tendency towards casualisation.

In the course of the next ten years, about 70 to 80 million youth will enter the Indian labour market with aspirations for a decent job and a good life. Decent jobs may, however, elude many of the youth since they would not have the requisite education and skills. It is on this point that the creation of industrial jobs assumes significance. As explained below, the creation of a large number of industrial jobs made possible by a rapid growth of the manufacturing sector (particularly organized manufacturing) supported further by a restructuring of the manufacturing sector towards more labour-intensive industries will enhance the prospects of the youth in getting suitable jobs.

The Indian economy is currently dominated by the services sector, and it is this sector which has grown relatively fast in last few decades. Employment in services, particularly in the organized component of services (hereafter, organised services), is demanding in terms of skills and education of workers. To present some data based on NSSO (National Sample Survey Organization) surveys, in 2009-10, about 80 per cent of the workers in the organised services had secondary education or above (an estimate based on unit records of 2009-10 employment-unemployment survey; see NSSO, 2011). On the other hand, only about 20 per cent of the working youth (age 15-24) and about 30 per cent of all youth (age 15-24) had an education level of secondary or above. Clearly, there is a mismatch.

One may argue that the extent of skill mismatch will get reduced over time as improvements take place in the educational profile of the youth. Indeed, between 1999-2000 and 2009-10, the proportion of youth with education level of secondary and above

increased by about 10 per centage points, an increase from 20 per cent in 1999-2000 to 30 per cent in 2009-10. Yet, the pace of improvement of the education-skill profile of the youth has been slow, and if the current trend continues, then among the youth that will enter the Indian labour market in the next ten years, only a minority will have the requisite education and skills to find jobs in organised services.

In contrast to the situation in organized services, organized manufacturing holds better potential for providing jobs to relatively less educated youth. According to NSSO data, in 2009-10, about 20 per cent of the workers in organized manufacturing had less than primary education (including illiterate) and another about 15 per cent had only primary education. Evidently, the manufacturing sector holds a much better potential for providing jobs to the less educated youth that will enter the job markets in the next ten years than the services sector.

Will manufacturing be able to create enough jobs for the youth? The situation does not seem very encouraging. Going by employment estimates based on NSSO data, between 2004-05 and 2009-10, there was an absolute decline in manufacturing employment. Taking a longer period 1999-2000 to 2011-12, the increase in employment in manufacturing was about 17.5 million, which comes to about 1.5 million per year. Of this increase in manufacturing employment, the organised manufacturing sector accounted for an increase in employment of about 5.2 million over the entire period 1999-2000 to 2011-12 or about 0.4 million per year. By contrast, each year about 7 to 8 million youth are expected to enter the job market in India in the next ten years. Evidently, the rate of job creation in manufacturing, particularly organized manufacturing, achieved in the past falls badly short of the job requirements of the youth that will enter job markets in the next ten years.

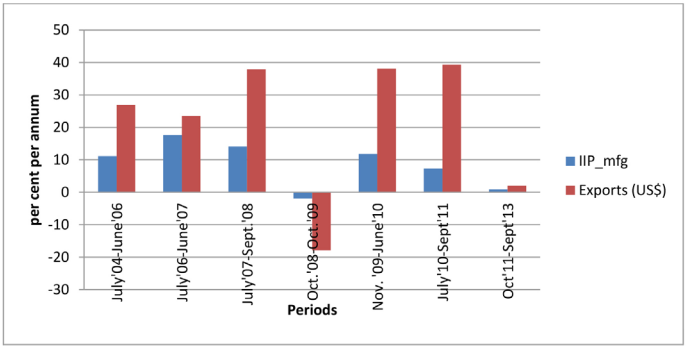
Manufacturing Output Growth and Employment Elasticity

In the years 2004-05 through 2007-08, the manufacturing sector recorded a high rate of output growth. The average growth rate in the index number of industrial production (IIP) for manufacturing was about 10 per cent per annum in this period. The growth rate come down sharply in 2008-09, but revived again in 2009-10 and 2010-11. From October 2011 began a period of low or negative growth in manufacturing. The average year-on-year (Y-o-Y) growth rate in IIP-manufacturing in different months in the period October 2011 to September 2013 was 0.9 per cent per annum (see Figure 1). This is very low in relation to the average growth rate in output achieved by Indian manufacturing in the 2000s (about eight per cent per annum).

The near stagnation in manufacturing production in the recent period coincided with a sharp fall in the growth rate in exports (see Figure 1). An earlier episode of poor manufacturing growth performance occurred during October 2008 to October 2009 when the average growth rate in IIP-manufacturing was negative. Interestingly, in this

period, the growth rate in exports was negative too. Evidently, there is some basis to argue that the sharp fall in the growth rate in India's export in the recent times is one of the main factors responsible for the slowdown in growth in manufacturing output in India. The fall in the growth of India's exports is in turn attributable to the global economic slowdown. This is indicated by Table 1, which shows the growth rates in India's exports and in global exports in different years during 2002 to 2012. The correlation coefficient between the growth rate in India's export and that in world exports during 2002-12 is high positive at 0.94. Thus, arguably, the global economic slowdown is one of the key factors responsible for the sluggishness in manufacturing output growth in the recent period. However, it would be wrong to assume that the current growth problems of Indian manufacturing are mostly or entirely attributable to the global economic slowdown. Rather, there are serious domestic constraints on industrial growth arising from adverse investment climate particularly deficiencies of the policy environment and inadequacies of infrastructure. The significance of this observation is that even if the global conditions do not improve much in the near future which cannot be ruled out, a major boost to the growth of manufacturing should be possible through domestic policy initiatives.

Figure1: Growth Rates in IIP - Manufacturing and Exports



Note: Computed from IIP-manufacturing data taken from the website of Central Statistical Office (Government of India) and data on India's exports expressed in US$ taken from the website of the Reserve Bank of India (RBI).

The above discussion on output growth in manufacturing is relevant to the key issue under discussion namely, creation of employment opportunities in manufacturing because unless the manufacturing sector grows fast it would not be possible to create a large number of jobs for the new entrants in the labour market. As mentioned above, the average growth rate in manufacturing output (indicated by IIP-manufacturing) in the last 23 months was less than one per cent per annum. This is no doubt abnormal and one would expect the growth rate in manufacturing output to go up in the near future. Here, the crucial question is, how high will the growth rate in manufacturing output be in the coming ten years.

Table 1: Growth Rate in Exports (in US$), World and India

Year	Growth Rate in Exports	
	World	India
2002	4.9	13.6
2003	16.8	19.7
2004	21.5	30.0
2005	13.9	30.0
2006	15.5	22.3
2007	15.6	23.3
2008	15.2	29.7
2009	-22.3	-15.4
2010	21.8	37.3
2011	19.5	34.6
2012	0.75	-3.1

Source: Growth rates for the years 2002 to 2011 have been computed from exports data taken from *International Trade Statistics,* 2012, World Trade Organization. Growth rate in world exports for 2012 has been computed from data on world exportsfor 2011 and 2012 given in *World Economic Outlook*, October 2013, International Monetary Fund. Growth rate in India's exports in 2012 has been computed from month-wise data on exports taken from RBI sources.

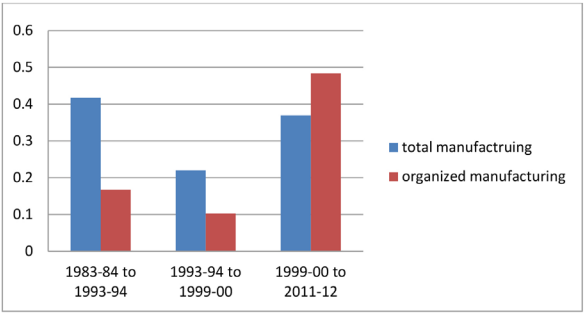
India's new *National Manufacturing Policy* aims at raising the share of manufacturing in India's GDP from about 15 per cent now to about 25 per cent in about ten years. If it is assumed that the average growth rate of the aggregate Indian GDP in the next ten years will be somewhere in range of eight to ten per cent per annum (on the ground that the target growth rate in GDP in the 12th Five Year Plan is 9 to 9.5 per cent per year), then for attaining the aim the new National Manufacturing Policy the growth rate of manufacturing should be somewhere in the range of 13 to 15 per cent per annum (Goldar, 2013). It does not seem realistic to assume that Indian manufacturing will actually attain an average growth rate of output in the range of 13 to 15 per cent per year in the next ten years. Rather, the growth rate is expected to be lower. According to the World Economic Outlook of the International Monetary Fund (October 2013), the growth rate in India's real GDP will be 3.8 per cent in 2013 (up from 3.2 per cent in 2012), 5.1 per cent in 2014 which will increase to 6.7 per cent in 2018. One may assume some acceleration in GDP growth rate beyond 2018. The average growth rate in GDP in the next ten year should accordingly be about seven per cent per annum with a margin of say plus-minus one per centage points. It seems reasonable to assume that the average growth rate in manufacturing output in the next ten years will be somewhere in the range of 8 to ten per cent per annum, though a slightly higher growth rate cannot be ruled out, to allow for the possibility that the *National Manufacturing Policy* indeed attains its aim.

How the growth rate in manufacturing will translate into employment opportunities in manufacturing is governed by the employment elasticity. In the period 1999-2000

to 2011-12, the employment elasticity in manufacturing was about 0.35 (see Figure 2). If this elasticity holds also in future, then a ten per cent growth in manufacturing output will result in a growth rate in manufacturing employment of about 3.5 per cent which is higher than the growth rate in employment achieved in the period 1999-2000 to 2011-12, but does not vastly enhance the annual rate of new job creation. If structural transformation in the manufacturing sector towards more labour intensive industries causes the employment elasticity to go up, the extent of employment generation will be higher.

It is interesting to observe from Figure 2 that the employment elasticity in organized manufacturing during 1999-2000 to 2011-12 was much higher than that during 1983-84 to 1993-94 and 1993-94 to 1999-2000. This basically reflects a fast growth in employment in organized manufacturing that has taken place since 2004-05. The average growth rate in employment in organized manufacturing in the period since 2004-05 has been about seven per cent per year, which is much higher than the employment growth rate achieved by organized manufacturing in the past. Goldar (2011) has examined the causes of this accelerated employment growth in organized manufacturing and has come to the conclusion that labour reforms undertaken by states were an important contributing factor.

Figure 2: Employment Elasticity



Note: Employment elasticity is computed as the growth rate in employment divided by the growth rate in real GDP (gross domestic product). The real GDP series has been taken from the *National Accounts Statistics* (Central Statistical Office, Government of India). Employment data for the major NSS employment-unemployment survey rounds have been taken and employment estimates for manufacturing has been made for those years.

Quality of Employment

It is not enough to count how many more jobs the manufacturing sector will create; one also needs to assess the quality of jobs that will be created. In this regard, there are some serious concerns. Unorganized sectors accounts for about 80 per cent of employment in manufacturing at present, and the proportion has not changed much over the past two decades. It seems therefore that the situation may not change drastically in the next ten years. Thus, about four-fifths of the new jobs created in manufacturing would

probably be in the unorganised sector. This is a matter of concern because the wages of workers in unorganised sector is relatively low. Table 2 presents a comparison of wages rates between organised and unorganised manufacturing for 2010-11. It is seen from the table that as compared to the wages of workers in organized manufacturing working in factories that have 500 or more workers, the wages of hired workers in unorganized manufacturing in less than half. In addition to wages, the organized sector workers have other benefits. Thus, there is a vast difference in the labour compensation between the two categories of workers.

Table 2: Comparison of Wage Rates and Manufacturing by Segments

Manufacturing segment	Wage rate (Rs. per worker per annum)
Unorganized manufacturing	42,440
Organized manufacturing	
- Employment size below 100	62,590
- Employment size, 100-500	76,773
- Employment size above 500	1,10,018

Source: Source: Wages per worker for unorganized manufacturing have taken from *Key Results of Unincorporated Non-agricultural Enterprises (excluding construction) in India,* NSS 67th Round, National Sample Survey Office, Government of India, June 2012. The wages per worker in organized manufacturing have been computed from data on workers and wage payment taken from *Annual Survey of Industries* (ASI) (Central Statistical Office, Government of India) for 2010-11.

It should be pointed out here that within unorganised manufacturing there are differences in wages between regularly employed and casual workers. The casual workers get a relatively low wage. Similarly, within the organized manufacturing sector, there are differences in wages between the directly employed workers and the contract workers. The latter get relatively low wages. The proportion of contract workers among organized sector workers has increased over time. In 2010, about 35 per cent of the workers employed by organised manufacturing were employed through contractors. The main point emerging from the above discussion is that even if a rapid growth in manufacturing helps in creating a large number of industrial jobs, a substantial portion of those jobs will be casual or contractual jobs in which the wages paid are relatively low.

Sen, Saha and Maiti (2010) present econometric evidence that indicate that stringent labour regulations have led to greater use of contract workers in organised manufacturing. Goldar and Aggarwal (2012) have analysed the factors that influenced the employment of casual workers in Indian manufacturing and found that that labour market reforms tend to increase the creation of regular jobs. Thus, there is econometric evidence to suggest that labour market reforms will help in lowering casual/contractual employment in manufacturing and thus add to regular, better paid jobs.

Conclusion

Considering that 70 to 80 million youth are going to enter the labour market in the next ten years, creation of a large number of industrial jobs is important, especially because many the youth may have low education and skills and thus find it difficult to get absorbed in the services sector. For creating a large number of industrial jobs, the manufacturing sector needs to grow fast. By contrast, the manufacturing sector has been experiencing a near stagnation for the last 23 months. To ascribe the current growth problems of Indian manufacturing mostly or entirely to the global economic slowdown is not correct, since there are several domestic constraints on manufacturing growth. Hence, pro-active policy initiatives are needed to boost the manufacturing growth, and when the global economic situation improves, there will be further boosts to manufacturing growth.

A high rate of growth of manufacturing may add to a large number of jobs, but this may not fully meet the aspirations of the youth since a substantial part of the industrial jobs may turn out to be rather low paying with limited or no benefits. This is a second problem that needs to be tackled. There is econometric evidence to believe that labour markets reforms will help in boosting the growth rate in manufacturing employment as well as lower the tendency towards casualization/ contractualization of industrial labour.

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Sluggish Growth in Employment
What are the Policy Initiatives?

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There has been a consistent policy interest in creating an environment for manufacturing growth over the years. But in the context of the sector's continuing poor performance, the new National Manufacturing Policy is a step in the right direction. It has promised to create 100 million more jobs and contribute 25 per cent to the GDP. Among other initiatives the proposed creation of a National Manufacturing Investment Zone or a cluster approach may well have critical impact.

It has been widely noted that growth alone is not sufficient to bring in any major improvement in economic and social wellbeing, particularly of those who are located at the lower echelons of the socio-economic ladder. Rapid growth in productive employment opportunities can distribute the benefits of economic growth among the deprived lot. In other words, employment growth at wages higher than the minimum subsistence level of consumption is crucial for poverty reduction and also to create a stable society that would be free from social turmoil and insurgency.

Industrialization is reflected in the structural shift both in the value added and the composition of the workforce. This structural change is accompanied not only by a rise in per capita income but also improvement in many other development indicators. It involves upward mobility of individual occupations and incomes and a shift in rural-urban composition of the population (Kuznets, 1966). However, in the Indian context, there hasn't been any remarkable shift in the workforce composition from agriculture to industry. Even after rapid economic growth, the share of manufacturing has remained around 11 percent.

Organised Manufacturing

The performance of the organized manufacturing in India in terms of the growth rate in gross value added showed marked improvement in the nineties compared to the earlier period (Table 1; see Mitra and Bhanumurty, 2007). Whether this growth had also resulted in faster employment elasticity or not, has been a matter of serious concern. In terms of mere growth rates both the number of workers and total persons increased from a mere

1 per cent per annum during the deregulated regime (1984-85 to 1990-91) to around 3 per cent per annum over the nineties though this growth has been only marginally above the growth rate that was experienced during the regulated regime (1973-74 through 1984-85). Man-days per worker and man-days per person grew negligibly during the eighties and nineties. For 'workers' category, man-days per worker is an important determinant of earnings, and hence the stagnancy in man-days per worker may have serious implications in terms of workers' income as it may have resulted from the decline in full-time jobs to the workers in the organized industrial sector. However, the constancy of man-days per worker or person may also have resulted from a rise in outsourcing and sub-contracting and assignment of jobs on piece rate basis. Also, it could be an outcome of exhaustion of scope to utilize labour more intensively (Bhalotra, 1998 and Nagaraj, 1994). For example, the contract workers were already utilised to the optimum and there was hardly any scope for further increase in the man-days per worker. Since the scope to utilize labour more intensively was possibly exhausted, firms were forced to employ additional workers in the nineties, reflected in higher employment growth rate.

The increase in the employment growth rate in the organised manufacturing in the nineties, particularly between 1990-91 and 1995-96, could also be explained by the huge expansion that took place in the early reform period. Both domestic and foreign investors invested at large quantities in this period with an over-expectation about the future prospects demand in the Indian economy and led to expansion in the capacity. This possibly led to an increase in the employment growth rate in the organized manufacturing, particularly in the private and joint sector. But, as output started declining or stagnating in the late 1990s, this resulted in capacity underutilization, which might have resulted in job losses (Nagaraj, 2004).[1] Despite this downturn, some argue that the employment growth in the organised manufacturing has increased in the 1990s compared to the 1980s (Goldar, 2000).

Wages per worker shows a fall in the growth rate, marginal though, during the 1990s. (This fall in growth of wages may also be one of the reasons for increase in the employment growth in the nineties.[2]) However, emoluments per person did not reveal so (Table 1). Quite clearly, the earnings of the skilled/educated employees other than the workers seem to have increased faster than those of the workers over 1990-91 through 1997-98.[3]

[1] Nagaraj (2004) argues that in the second half of 1990s, organized manufacturing sector has lost 15 percent of workers across the states and industry groups, mostly due to VRS in public sector and retrenchements and lay-offs in the private sector followed by relaxed labour laws in the country.

[2] Goldar (2000).

[3] Reforms were initiated in July 1991 in India.

Table 1: Growth Rate of Select Variables (per cent per annum)

Variables	1973-74 to 1984-85	1984-85 to 1990-91	1990-91 to 1997-98
Gross Value Added	6.4	7.9	9.4
Gross Output	7.6	8.4	8.6
No. of Workers	2.8	1.1	3.1
Mandays per Worker	1.9	0.2	0.2
No. of Persons Employed	2.9	1.1	3.2
Mandays per Person Employed	1.7	0.3	0.2
Wages per Worker	3.0	3.2	2.7
Emoluments per Person Employed	2.4	2.9	3.3
Fixed Capital	7.1	6.4	10.8

Note: 1.Gross output and value added have been deflated by the wholesale price index of the corresponding product group, and fixed capital, by the combined price index of machinery and metal products with 1981-82 as base).
2. Persons include workers and other employees inclusive of administrative and managerial staff.
Source: Annual Survey of Industry Data (compiled by Economic and Political Weekly Research Foundation).

The gross value added growth rate continued to be a little above 9 per cent per annum during 1998-99 to 2007-08 (Table 2). However, the employment growth rate declined further from its earlier low in 1990-91-1997-98 period more so in the case of employees other than workers.[4] As a result, labour productivity employed grew at almost 7 per cent per annum. Wages per worker remained almost stagnant while the remuneration per person shot up significantly, implying a substantial growth in the salaries per employee (excluding workers).

Table 2: Growth Rate of Select Variables (per cent per annum)

Variables	Rate of Growth (% p.a.)
Gross Value Added	9.45
No. of Workers	2.98
No. of Persons Employed	2.58
Wages per Worker	0.20
Emoluments per Person Employed	5.31
Fixed Capital	4.34
Labour Productivity (Value Added per Person Employed)	6.87
Capital-Labour Ratio (Fixed Capital per Person)	1.75

Source: Annual Survey of Industry Data (compiled by Economic and Political Weekly Research Foundation).

[4] The employment growth rate in the organized manufacturing sector over 1998-99 through 2007-08 as per the ASI data is however higher than the total employment growth rate shown by the NSS employment-unemployment survey over 2004-05 to 2009-10 though the ASI growth rate is quite close to the NSS estimate over 1999-2000 to 2004-05.

There is a strong positive correlation between the average value added growth and total employment growth measured across all the three digit manufacturing groups (0.77), implying growth is essential for employment generation. However, not necessarily rapid value added growth has resulted in faster employment growth. In spite of the fact that many industries grew rapidly in value added terms, total employment increased only at around 2.6 per cent per annum over the period 1998-99 through 2007-8.

On the whole, for the entire period under consideration (1998-99 through 2007-08) value added growth has been fast in a number of industries as compared to employment growth. Though rapidly growing industries in terms of employment witnessed faster value added growth as well.

In fact, in some of the industries with sluggish employment growth, value added still has grown sizably notwithstanding a strong positive correlation between the value added and employment (average) growth rates across industries. Particularly, the growth scenario of employees other than workers represents a gloomy picture since many industries showed a negative growth rate. This comes as a bit of surprise, particularly keeping in view the popular belief about a favorable job market for the ones who are highly skilled. Usually greater concern has been expressed for the unskilled workers as they are characterized by poor employability. Two reasons may be considered to explain this: (a) because of a high level of salary for the employees other than workers their absorption rate has been sluggish, (b) the recent phase of industrialization is partly because of the rapid spread of industries in the states which were less industrialized earlier and hence, this spur has been accompanied by a rise in the demand for shop floor workers. Nevertheless there are a sizeable number of industries which experienced rapid growth in terms of value added and total employment both.

Importantly, have the so-called labour intensive industries been generating employment significantly? There is a positive relationship between the rate of growth in capital-labour (i.e., total person engaged) ratio and employment growth, implying both the factors of production can increase simultaneously though capital may be increasing at a faster pace than labour. We also note that higher is the level of capital-labour ratio, lower is the employment growth rate implying while some of the labour intensive industries may be experiencing rapid employment growth some others tend to grow sluggishly.

Decomposing value added growth into its components-employment and productivity, we observe that only a handful of industries[5] have experienced simultaneous growth in both. This implies that growth in value added has been led through the adoption of capital-intensive technologies. Thus there has been a trade-off between employment growth and capital growth.

[5] 173 (manufacture of knitted and crocheted fabrics), 182 (dressing and dyeing of fur etc), 232 (manufacture of refined petroleum products), 281(manufacture of structural metal products, tanks etc), 300 (manufacture of office, accounting and computing machinery), 312 (manufacture of electricity distribution and control apparatus), 319 (manufacture of other electrical equipment), 332 (manufacture of optical instruments etc), 372 (recycling of non-metal waste and scrap) and others.

Unorganised Manufacturing

The unregistered manufacturing as per the National Accounts Statistics of the Central Statistical Organisation accounts for around 34 per cent of the total manufacturing value added. The units within the unorganised manufacturing sector have been divided into three types: own account manufacturing enterprises (OAMEs) are those which use only household or family labour, non-directory manufacturing enterprises (NDMEs) employ 1 to 5 workers of which at least one is hired and the directory manufacturing enterprises (DMEs) in the unregistered manufacturing include units with 6 to 9 workers irrespective of using power, and units with 10 to 19 workers without using power. However, the definition of workers in the surveys on unorganised manufacturing enterprises by NSSO is very broad. No distinction is made between fulltime and part time workers, and more importantly no time dimension is used in defining a worker. In other words, anyone attached to the unit in whatever way possible, is defined as a worker. The interpretation of employment related concepts in this sector, therefore, has to be made very carefully. Further we may note that the recent survey, 2010-11 has not provided the data for NDMEs and DMEs separately – all being clubbed under establishments.

Comparing the growth rates in terms of employment, output and number of enterprises across the own account manufacturing enterprises (OAME), non-directory manufacturing enterprises (NDME) and directory manufacturing enterprises (DME) - the three segments of the unorganised manufacturing component it is seen that growth in the reform period has been relatively faster in NDME segment compared to the other two segments, particularly in terms of employment and number of enterprises. However, at the aggregate level, employment growth in the unorganized sector has been extremely sluggish.

An analysis of output growth in unorganised manufacturing by major industry groups reveals that textiles and leather, non-metallic mineral products, basic metals, metal products, and machinery and transport equipment achieved relatively faster growth in real value added compared to the other sectors during the post reform period. However, employment growth turned out to be as high as 2 per cent per annum only in textiles, chemical, metal products and transport equipment.

Almost uniformly, growth in urban areas is found to be faster. The only exception is growth in real value added in NDME and DME – the growth rate in rural areas exceeded that in the urban areas though the total value added growth in the unorganised manufacturing has been higher in the urban areas than that in the rural areas. The faster growth in the number of enterprises in the urban areas could be due to the change in the location of the enterprises which could be an outcome of both promising enterprises shifting actually to the urban areas and the reclassification of rural areas as urban over time.

An important point that comes out clearly is that the growth rate in value added in unorganised manufacturing has been much faster than the growth rate in number of workers and number of enterprises during 1989-90 to 2005-06, which broadly corresponds with the reform period. The implication is that value added per worker as well as value added per enterprise has grown rapidly, particularly in the rural areas. However, the employment growth rate was extremely sluggish for which the productivity growth rate has been quite fast in the post reform period and this needs to be interpreted carefully. Besides, the measurement of value added in the NSS surveys on unorganised manufacturing has possibly undergone major improvements over time and if so, the growth rates in value added are not strictly interpretable. Similarly the definition of employment in these surveys to begin with has been quite loose and is not comparable with the NSS employment-unemployment survey, as mentioned above. Part of the decline in the employment growth rate over time in the unorganised manufacturing sector can be attributed to improvements in estimating the number of workers more rigourously.

Over the more recent period, i.e., 2005-06 through 2010-11, employment growth has been mostly negative in the own account enterprises. However, in the establishments it was a little below 2 per cent per annum though across industry groups large variations are discernible. The aggregate employment figure for all establishments and own account enterprises turns out to be negative over 2005-06 through 2010-11.

Some of the findings from our qualitative survey are brought in to delineate the recent changes that are being observed in the informal sector. Employment growth in the informal (unorganized) manufacturing sector has been negative between 2005-06 and 2010-11. Possibly the informal sector units are not able to compete and thus in an attempt to reduce labour cost the downsizing of employment has taken place widely. Due to lack of modernization and inaccessibility to ICT, exports from the unorganized manufacturing sector have not picked up. Neither product diversification nor value upgradation has taken place that will allow Indian units to reap advantages of globalization.

Policy Issues

Realising the importance that over the next decade, India has to create gainful employment opportunities for a large section of its population, with varying degrees of skills and qualifications, the manufacturing sector is expected to be the engine of this employment creation initiative. Apart from the employment imperative, the development of the manufacturing sector is critical from the point of view of ensuring a sustainable economic growth in India. Thus, with the objective of developing Indian manufacturing sector to reflect its true potential, the Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry, has embarked on creating a policy environment that would be suitable for the manufacturing sector to grow

rapidly. Keeping in view the importance of the employment-industrialization-policies as mentioned above and also the fact that India has not been able to generate employment opportunities in the organized/formal manufacturing sector on a large scale, the national manufacturing policy comes as a silver lining.

In the backdrop of a global recession and large job losses if corrective steps are not taken India's situation can be worse off. From this perspective, the recently cleared National Manufacturing Policy (NMP) promises to create a 100 million more jobs and contribute 25 per cent to country's GDP in a decade. In the face of dampening demand and rising cost of capital the experts in the policy circle believed that it can change the fate of manufacturing in India and turnaround the overall economy.

The policy addresses in great detail the environment and regulatory issues, labour laws and taxation, but it is the proposed creation of National Manufacturing Investment Zones (NIMZs) or clustering of manufacturing units that is treated as a unique way of integrating the industrial infrastructure and achieve economies of scale. NIMZs will be developed as integrated industrial townships with world class infrastructure and land use on the basis of zoning, clean and energy efficient technology with a size of at least 5000 hectare.

The NIMZs will be on the non-agricultural land with adequate water supply and the ownership will be with the state government. It aims at introducing flexibility in the labour market by offering greater freedom to the employers while hiring and firing. It also enables the sunset industrial units to follow a simplified exit mechanism. At the same time it insists on workers' rights which run the risk of being compromised in the name of flexibility.

An important feature of the manufacturing policy is its financial and development incentives to the small and medium enterprises. On the whole, the policy, promises to increase the share of manufacturing sector to the country's gross domestic product to 25 per cent from existing 16. However, the national manufacturing policy's objective of raising the industrial employment to an unprecedented level may not be realized as the organized manufacturing employment comprises only a fraction of the total manufacturing employment.

It may be therefore useful to consider the employment potential of the unorganized manufacturing sector as well and tap the potentials to create quality-employment in this sector. Small and medium enterprises (SMEs) need to undergo an innovative revolution in terms of scale of operations, technology, financing and ways to upgrade skills of workers. Since labour intensive sectors like food processing, apparels and textiles, leather and footwear contribute to over 60 per cent of SMEs' employment (Kant, 2013), greater focus on the labour intensive sectors will enable productive absorption of surplus unskilled labour. Though our study did not deal with the regional profile of the labour market and aspects relating to inter-spatial industrial growth disparity, the policy initiatives need to give top priority to labour intensive goods based industrial growth

in regions characterized by greater magnitudes of unskilled labour and insignificant industrialization.

Issues relating to infrastructure shortage, constraints on energy supply, sluggish exports growth and poor performance of labour intensive exportable goods sector, the lack of innovations required for developing appropriate technology and bureaucratic and administrative rigidities in areas where they tend to hamper growth and employment or attract foreign investment are undoubtedly important though an empirical investigation of all of that remained outside the ambit of the present study.

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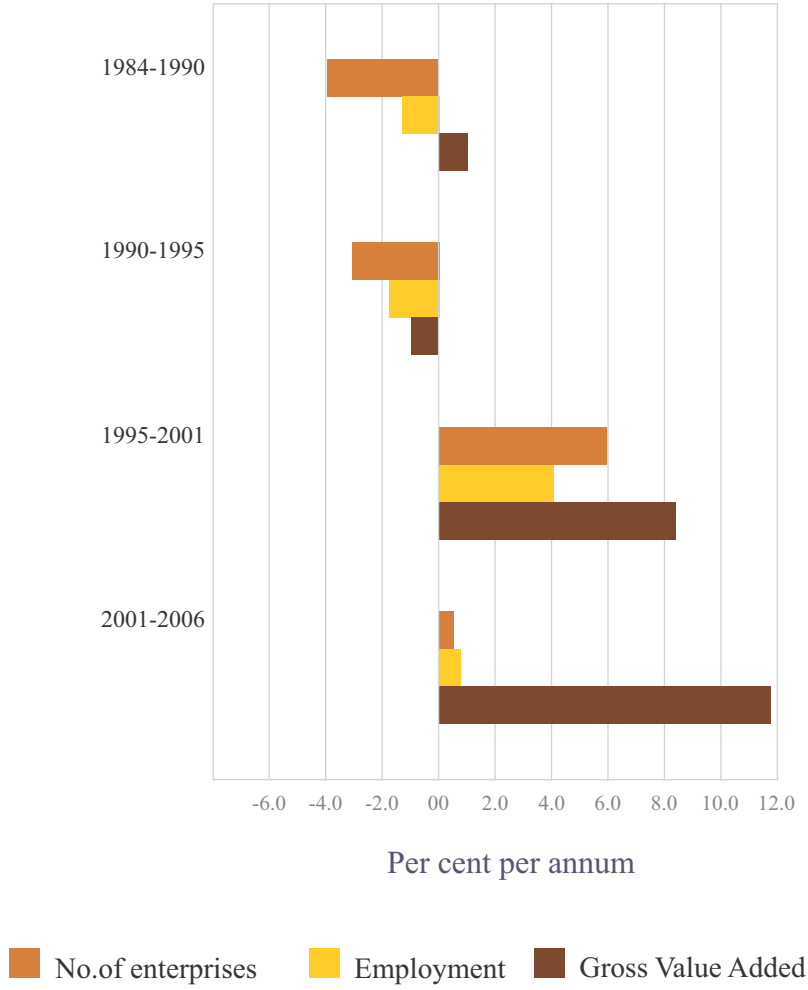
Growth in Number of Enterprises, Empolyment and Gross Value Added



Source: How have Informal Firms Evolved? Size, Structure and Productivity in Informal Manufacturing Sector
Rajesh Raj SN, Vinish Kathuria

How Have Informal Firms Evolved?

Size, Structure and Productivity Growth in Manufacturing

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Informal manufacturing enterprises form the majority of the country's industrial firms. Although the formal manufacturing sector began to show signs of decline in the latter half of 1990s after a successful turn in the first half of the decade, the larger impact was possibly mitigated by the growth of the informal manufacturing sector. How sustainable is this growth? Is the growth of small units in this sector a sign of distress or is it a manifestation of the adoption of more flexible production systems that help firms to reduce costs and undertake customised production? Overall there is plenty of empirical evidence to challenge the notion that the informal sector cannot achieve productivity nor create jobs. A comprehensive policy that addresses the problems of specific industry groups and resolves the many structural issues is required. All the tables are available at the end.

The informal sector occupies an important place in developing economies. In India too, the informal sector constitutes an important segment of the economy both in terms of output and employment.[1] This sector contributes to about 60 per cent of total net domestic product (NDP) and provides livelihood to nearly 93 per cent of the work force (Kulshreshta and Singh, 2001) and over a period of time its presence and extent have been growing (Sakthivel and Joddar, 2006). The greatest contribution of the sector is in agriculture, where it forms almost entire employment and about 97 per cent of gross domestic product (GDP) (Papola, 2004). Its presence adds considerably to the total income and employment in non-agricultural sectors as well. In 2005, the informal sector contributed about 45 per cent to GDP and 72 per cent to employment in the services

[1] Many terminologies have been used to refer this sector in India such as unorganized sector, unregistered sector besides informal sector. In the present paper, we have used the term 'informal sector' to represent the sector.

sector (NCEUS, 2009). As regards the manufacturing sector, about 40 per cent of NDP and 84 per cent of the workforce came from the informal sector (Papola, 2004).[2]

India's industrial sector has in the past, enjoyed significant protection through tariffs, quantitative restrictions, industrial licensing and other controls, which had considerably affected the growth and performance of firms in the manufacturing sector. It was also argued that the dualism evident in the manufacturing sector was a legacy of a set of economic policies followed in the past (Little, 1987; Gang, 1992; Tybout, 2000). An important facet of this economic policy shift in the 1990s was the gradual dismantling of industrial licensing for nearly all manufactured goods and the gradual dereservation of products meant for small-scale enterprises. These reforms were mainly in product markets and varied substantially over time and across industries. Given the crucial presence of informal sector firms in the manufacturing sector, it provides us a unique empirical context to evaluate the changes in the size and structure of informal sector with the advent of these significant reforms in the industrial sector. To be more specific, we analyse here the size, structure of employment and investment and changes in partial productivity at the disaggregate level (two-digit industry level) for the period 1984-85 to 2000-01.

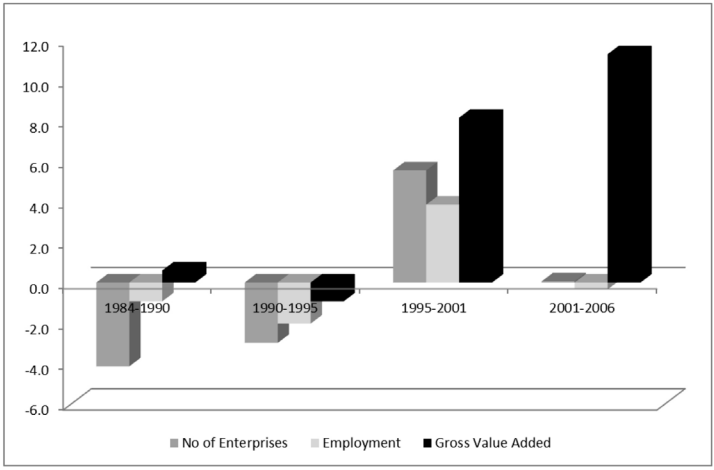
A note on sources of data and the definition of variables is provided in Annexure 1

How large is the Informal Sector?

The informal manufacturing sector provided employment to about 36.5 million people in India in 2005-06 (Table 1). The level of employment contracted during 1984-85 to 1994-95 and then surged up in the second half of the 1990s (1994-95 to 2000-01) with a marginal decline in next five years (2000-01 to 2005-06). There was a loss of about 4.8 million jobs in the first period (1985-1995) and a gain of 7.5 million jobs in the second period (1995-2001) and a marginal loss of 0.65 million jobs during 2000-01 to 2005-06. The spurt in employment observed during 1994-95 to 2000-01 had a beneficial impact on output as well. However, the value added rose from 2000-01 to 2005-06 despite the decline in employment. This reflects an increase in labour productivity over the period. As is evident in Table 1, the total output increased from Rs. 244.84 billion in 1994-95 to Rs. 511 billion in 2005-06, at an annual average rate of growth of 6.92 per cent. Of late, the sector has been able to shed the image of poor performer it had acquired in the reforms period and started registering gains especially during the second half of the 1990s and early part of following decade.

[2] Under the Factory Act, the formal sector in the manufacturing sector comprises of units that employ more than 10 workers with the aid of power or more than 20 workers without the aid of power. All other units are classified under informal manufacturing sector.

Figure 1: Growth in Number of Enterprises, Employment and Gross Value Added



Note: Real Annual Average Growth has been estimated using $\left(\frac{Y_t}{Y_0}\right)^{\left(\frac{1}{n}\right)}-1$

Source: Authors' computations based on data from NSSO (1989, 1995, 1998, 2002, 2002a, 2007, 2007b); CSO (1985, 1995).

Improved performance in terms of valued added and labour productivity throws up several pointers. Did all types of firms exhibited a similar growth pattern observed at the aggregate level? What are the structural changes in this sector on account of this growth performance? Is it possible to sustain this growth in the long run?

Dynamics of the Informal Manufacturing Sector

The informal enterprises are constantly churning. Many of these changes cannot be captured by merely analysing the sector at the aggregate level. It is only when the individual components of these changes are dissected, the nature and magnitude of this churning becomes evident. Not only are new firms being created but existing ones are also undergoing changes in terms of size. The surviving firms are either expanding or contracting and some tiny firms are graduating to medium firms and medium firms to bigger ones. Similarly, there can be a change in the rural-urban composition of firms in the sector. To capture these dynamics, we need to examine the movement of various constituents of the sector over time.

We captured the dynamics of the sector by using four indicators: (a) size of the enterprise, measured using (i) employment per enterprise and (ii) fixed capital stock per enterprise; (b) 'location' of the enterprise by examining the rural-urban composition in number of enterprises, employment, GVA, and fixed capital stock; (c) examining the changes in the composition of different types of enterprises (namely, OAMEs, NDMEs and DMEs) in selected variables; and (d) organic or traditional enterprises versus inorganic or modern enterprises.

Size Structure: Typically, enterprises in the informal manufacturing sector invest relatively less in fixed assets unlike their counterparts in the formal sector. This implies that the production process in the sector will be more labour intensive. Even then focusing on employment per enterprise alone may not adequately capture the changes in the size of the sector as some firms would have expanded their capital base especially during the 1990s, when the reforms opened up significant opportunities for manufacturing firms. Recognising this, we used both employment per enterprise and capital stock per enterprise to investigate the changes in the size of the sector over time.

On an average, OAMEs employ about two workers, NDMEs employ not less than three workers and the DMEs employ at least ten (Table 2). We find that an average OAME witnessed a steady expansion in size till 1994-95 and a decline thereafter. The size of the enterprise in the NDME sector remained more or less same during the 90s while an average DME observe a significant contraction in size in 1994-95 and thereafter their size increased but is still below pre-reform period. It could be possible that some of the larger firms in the DME sector would have graduated to the bottom end size classes of the formal manufacturing sector. The growth of smaller firms in the formal manufacturing sector perhaps lends some credence to this observation (Bhalla 2003). Interestingly, this phenomenon is more prevalent for units located in urban areas than in rural areas.

Using fixed capital stock per enterprise as a measure of size, we observed a decline in the size of the OAME sector while the other two enterprise types have considerably enhanced their size between 1984-85 and 2005-06 (Table 3). A special mention may be made of the DME sector that has increased its size by more than four times during the period. The decline in the case of OAME sector was confined to the period, 1984-85 to 1989-90 and thereafter there has not been a clear pattern.

Overall our analysis points to significant changes in the sector over the period 1984-85 to 2005-06. A move away from labour intensive production process is evident in the DME sector. To a certain extent, a similar tendency is noticed in the NDME sector too, where the capital investment had nearly doubled during the first 15-year period of the study but after that has remained same. Only the OAME sector remained labour intensive throughout the study period. Surely, this would have implication for productivity of the segment.

Rural Urban Shift: Leaving the Rural Tag Behind: Most enterprises in the informal manufacturing sector are located in rural areas. In 2005-06, about 71 per cent of the enterprises are in rural areas, providing employment to not less than 65 per cent of the informal manufacturing workforce (Table 4). But these enterprises together contributed only 43 per cent of the total value added implying the low productivity of enterprises in rural areas.

Our analysis points to gradual decline in the dominance of rural enterprises over time. A 5 per cent drop in the rural share in number of enterprises, over 8 per cent drop in employment and 26 per cent drop in fixed investment has been noticed between 1984-85 and 2005-06. The rural share in value added declined only marginally during the same period but it is primarily on account of the increase in the contribution from the DME sector; its share in gross value added improved from 19.5 per cent in 1984/5 to 30.0 per cent in 2005-06 (Table 4). It is clearly evident from the analysis that erosion in the share of rural sector is an outcome of declining contribution from rural OAME and NDME sectors.

Small Vs Big: Dominance of Smaller Enterprises: Our shift-share analysis indicates a shift towards bigger enterprise during the study period. OAME, although contributing to major share of employment and number, its contribution to GVA is low. Due to higher productivity from DMEs, their share has increased. (Table 5) .

Organic versus Inorganic Industries: The pace of a transition characteristic of modern economic growth can be judged from the composition of traditional and modern industries in the sector. The traditional industries are those that primarily rely on organic/natural raw materials. This group comprises of industries producing food, beverages, cotton, textiles, wood and leather products. On the other hand, the other group depends heavily on inorganic, chemicals and metal based inputs. They are relatively small in number but are fast growing and include rubber, chemicals, basic metal and alloys industries in addition to those producing all kinds of industrial and other kinds of machinery, transport equipment and parts and so on.

Modern economic growth traditionally represents a shift away from organic raw materials based industries towards industries relying on inorganic, chemicals and metals based, inputs. We examined whether a shift towards modern industries can be discerned in the informal manufacturing sector. We find that traditional industries still occupy a larger share in enterprises, employment and GVA in rural and urban sectors and the sector as a whole (Table 6). However, a shift towards industries that primarily depend on inorganic inputs was discerned till 1994-95. But the late 1990s and early 2000 witnessed a reversal in this trend with the traditional industries gaining in importance. The growing importance of traditional industries during the second phase of reforms indicates two possibilities: an outcome of greater focus on food processing and leather sector or alternatively, it could be a distress driven phenomenon if the increase is not from these two sectors. It is well acknowledged that starting an enterprise in the organic or traditional industry sector is less costly and less risky. An entrepreneur may not require large amount of working capital and service of skilled workers for staring a firm in the sector. These firms tend to enter in great numbers when the overall economy is

weak. Hence the growth of traditional industries in the sector may perhaps be a result of post-reform slump in the growth of formal manufacturing sector. This conjecture is further strengthened by the fact that the share of OAME and NDME sectors reported an increase only in number of enterprises and employment and not in GVA, which has declined drastically especially for OAME.

Disaggregate Industry Level View

While the aggregate level picture is useful in analysing the structural changes over time it could mask the differences across industries and their contribution to these changes.

Major Employment Providers and Value Generators: In general a huge portion of the informal manufacturing sector is retained by the traditional industries. Five major industries (food products, beverages, cotton goods, textiles and wood products) account for 81 per cent of the total enterprises and 73 per cent of the total workers employed in the sector in 2005-06 (Table 7). But less than 60 per cent of the contribution in total value added in the sector emanated from these traditional industries. Importantly, we observed a decline in their contribution till 1994-95 and thereafter increased contribution in terms of employment, number and GVA.

We also found that these industries contribute a significantly higher share in the rural sector than in the urban sector. (Table 7). It may be noted, however, that their contribution in terms of employment and GVA has declined in both rural and urban areas between 1984-95 and 2005-06, though number of enterprises has gone up for rural areas over the period.

Among the traditional industries, textiles (especially apparel) improved its share in rural and urban areas between 1984-85 and 2005-01 while the beverages industry, despite its increased contribution to enterprises and employment, witnessed a drop in its value added share (Table 7). The relative significance of other traditional industries in the sector has also declined except paper industry, which gained in its share in rural and urban areas.

Industries manufacturing non-metallic minerals, metal products and other products are the major industry groups in the category of 'modern' industries (Table 7). The 'others manufacturing industry' group considerably increased its contribution to number of enterprises, employment and gross value added in rural and urban areas. In fact, its contribution to gross value added has more than doubled during 1984-85-2005-06. The share of non-metallic minerals in employment and gross value added increased during the same period while metal products witnessed a surge only in its share in urban enterprises and employment. Among the other 'modern' industries, machinery industry improved its share in the sector where as the significance of transport industry eroded over the period 1984-85-2005-06.

Pre-dominantly Rural Vs Pre-dominantly Urban Industries: A major portion of activities in the informal sector is taking place in the rural areas. This does not mean that rural enterprises dominate all types of industrial activities in the sector. There are a number of industries where urban enterprises occupy a major share. This section identifies industries that have a dominant presence in rural areas and those located in urban areas. By doing so, we also examine the changes in their orientations over time. Following Bhalla (2003), we classify industries into four categories based on their rural or urban orientation in employment in 2005-06 (Panel 1).

Panel 1: A Cross Classification of Industries based on Employment Criterion

Category	Criteria
Vastly Rural (VR)	≥80 per cent employment in rural areas
Mainly Rural (MR)	50-80 per cent employment in rural areas
Mainly Urban (MU)	30-50 per cent employment in rural areas
Vastly Urban (VU)	<30 per cent employment in rural areas

In 2005-06, three industries namely, beverages, wood products and non-metallic minerals fall under the **vastly rural** (VR) industrial category. While wood products and non-metallic minerals remained in this category since 1984-85, beverages industry entered 2000-01 onwards (Table 8).

A deeper analysis reveals that beverages industry has constantly expanded its presence in rural areas. With the given trend, the share of beverages in employment and GVA in rural areas may further increase in the future. As regards the manufacture of wood products, the share of enterprises and employment in rural areas has been fairly stable over time though its rural share in GVA witnessed a decline. Manufacture of non-metallic minerals products had a consistent rural share in enterprises, employment and GVA till 1994-95 but saw its share declining afterwards.

Food products, textiles and chemicals are the three industry groups in the **mainly rural** (MR) category in 2005-06. Of these, the first two are traditional industries, which remained in the MR category throughout the period of study, and the latter belonging to the "modern" category. Food products maintained a consistently stable rural share in enterprises, employment and GVA in the informal manufacturing sector while in the case of textiles, there are indications that their dominance in rural areas may taper off. As is evident from table 7, the rural share in enterprises, employment and gross value added by these industries is on the decline. The rural share has not shown a definite trend with regard to the manufacture of chemicals. On the whole the VR and MR categories consists of six industries – 4 traditional and 2 modern industries – that account for about 86 per cent of the total enterprises, 83 per cent of total workforce and 69 per cent of gross value added by the informal manufacturing sector, regardless of location.

The remaining eight industries are in the MU and VU categories; five industries are in the former category and the other three in the VU category. There are clear signs of erosion of the urban dominance of rubber products and basic metal and alloy industries as they are relegated to MU category from VU category in 2000-01. The manufacture of paper products has maintained a consistently stable urban share in enterprises, employment and gross value added and remained in the VU category throughout the study period. Manufacture of transport equipment and parts, on the other hand, entered the VU category in 1989-90. Manufacture of machinery and parts is the other industry group whose workforce and output have been overwhelmingly concentrated in cities and towns over the period 1984-85-2000-01. In leather products, rubber products and others industry group also, activities are concentrated more in urban areas than in rural areas. Manufacture of cotton and leather products are two examples of industries fast changing to an urban category from a rural dominant one.

Sunrise and Sunset Industries: We define sunrise industry (SR) as the one that is growing fast and is expected to play a key role in the future where as a sunset industry (ST) is an industry that is in decline, one that has passed its peak or boom periods. Many suggest output growth as an ideal indicator for classifying the industries into sunrise and sunset industries. Given that informal sector employs major chunk of the manufacturing work force in India, it would be also important to look at the growth in employment as a performance criterion. As employment alone at lower levels of income is not sufficient to ensure the overall well-being of the workers in the sector, the focus should be on growth with increasing labour productivity, that is, industrial growth generating quality employment. Taking cognisance of it, we classify sunrise and sunset industries based on growth in value added, employment and labour productivity. With the help of these three indicators, we identified six categories under the broad groups of sunrise and sunset industries.

In 'sunrise industries', we included two categories of industry groups and the remaining four categories are classified into 'sunset industries'. In common parlance, growth in GVA is regarded as the most important indicator of the economic prospects of an industry. However, we depart from this convention since we feel that it is important to ascribe greater importance to the growth of employment especially productive employment, as it would be beneficial to the economy in the long run. Using this criterion, the 'sunrise industries' include two industry categories both with growing value added and labour productivity but the one with growing employment and the other with declining employment. The emphasis here is on the generation of productive employment. In contrast, all other industries with poor quality of employment are categorised under the 'sunset industries' group.

We find that the number of industries belonging to the "sunrise industries" group has

almost doubled between 1984-90 and 1995-2001 (Table 9) implying that a large number of manufacturing industries in the informal sector had grown with quality employment in the late 90s. But a major part of the graduation (from SS to SR) occurred during the 90s. What is more striking is the fact that 12 out of 15 industries in the sector were in the SR group over the period 1995-2001 and among these 12 industries, nine were in category A as they recorded growth in all the three indicators. Manufacture of rubber products is the only industry that had relegated from category A in the early 90s to category C in the late 90s.

It is found that the number of 'sunrise industries' belonging to the 'modern' industry group has been consistently rising over time, from 3 in 1984-90 to 5 in 1990-95 and then to 7 in 1995-2001 (Table 10). The only 'modern' industry, which was left behind in the growth process, is the manufacture of rubber products. Beverages and wood products are the only traditional industries remained in the 'sunset industries' group.

In short, the industries in category A have demonstrated that they can survive and prosper even in an environment where informal manufacturing units in some other industries are doing badly. They are expected to do well in the future too unless the policy environment faced by them is made unfavourable. As regards the industries in category B, they have succeeded in raising labour productivity, at least in part, by reducing the workforce engaged in them. They have also recorded positive GVA growth rates. As long as they continue to raise labour productivity, they will be able to maintain the current growth performance though the prospects of raising employment in these industries remain remote. The likely scenario appears to be a lesser number of enterprises and workers, but higher per worker and per enterprise productivity. Industries in category C may be treated as the ones that deserve special support on income generation grounds.

Trends in Labour Productivity Across Industries

One of the major concerns raised with respect to the sector is its ability to generate productive employment given its abysmally low level of productivity aided by the employment of low skilled, less educated workforce and the adoption of obsolete technology. Evidence on this across space (rural and urban) and over time at the industry level is rather scanty. In this section, we fill this visible gap in the literature by providing fresh evidence on the productivity of informal manufacturing sector across industries by examining the trends in labour productivity for the period 1984-85 - 2005-06.

Table 11 presents the growth of labour productivity for the four periods, 1984-85 to 1989-90, 1989-90 to 1994-95, 1994-95 to 2000-01 and 2000-01 to 2005-06. As is evident from table 11, labour productivity reported a consistent growth in the informal manufacturing sector. It grew in all the three sub-periods, though the growth slowed down in the early 90s. The late 90s witnessed the fastest growth of labour productivity at 4.6 per cent per annum. Most industries reported a growth in labour productivity in the

late 1990s; a trend started from the first half of the 1990s in many industries. The rates of growth, however, showed marked variation across the two-digit industries and, for the same industry, between the two-time periods. It may be noted that the positive labour productivity growth registered by the sector during 1984-90 was an outcome of the better performance by a handful of industries. However, this wide variation in growth rates has declined considerably in the recent period. Despite significant growth in labour productivity, wages paid to the worker did not witness a commensurate increase over time. Data shows that the growth of emoluments per employee reported a marked decline in the late 1990s. In other words, workers in most industries did not receive improvement in wages commensurate with their improved contribution in value added.

Conclusion

In India, the informal manufacturing enterprises form majority of the country's industrial firms. Our focus is on the manufacturing sector, which has experienced a remarkable structural change in the industrial environment with the advent of economic reforms of the 1990s. It is well known that the formal manufacturing sector after a successful first half of the 90s started showing signs of decline. We argue that the shock-absorbing role played by the informal manufacturing sector perhaps helped in lessening the impact of this growth decline in the formal sector.

Evidence shows that the sector has been slowly able to shed the image of poor performance during the 1990s and has started registering positive gains.. Notably the major part of the increase was absorbed by own account and non-directory enterprises as is observed from their growing share in the sector. This trend coupled with the growth decline in the formal manufacturing sector, however, casts doubts on the long run sustainability of growth of informal manufacturing. This is especially because the growth of small units in the sector is possibly a manifestation of distress aided by the growth decline in the formal manufacturing sector. But the shift towards small sized units could also indicate an effort at introducing flexible production systems, which would help the firms to reduce costs as well as to undertake customised production at a smaller scale.

It is also evident that jobs were increasingly created in the urban areas as indicated by a shift in the structure of employment from rural to urban areas. The traditional industries still occupy a larger share in enterprises, employment and GVA in rural, urban and overall sector. The analysis clearly shows that, overall, in the whole period under examimation there has been a swing towards industries that primarily depend on inorganic inputs, However, after a continuous decline up to 1994-95, the organic industries witnessed an increase in their share thereafter. Further, most of these traditional industry groups occupy a greater share in the rural areas as compared to their share in urban areas. However, their overall contribution to both rural as well as urban areas has declined over time.

On the productivity front, certain industries have employed their resources productively in the rural areas while some did it creditably well in the urban areas. Overall, empirical evidence reveal that not only urban units but also units located in rural areas are capable of improving productivity. Thus there is a need to take a cautious approach where industries, which are lagging behind in terms of productivity, need to be identified and a comprehensive policy agenda that can well address the problems faced by the specific industry groups needs to be formulated.

Annexure 1: Sources of Data and Definition of Variables

Data are drawn from the large national level surveys conducted by the National Sample Survey Organization (NSSO) during its 40th (1984-85), 45th (1989-90), 51st (1994-95), 56th (2000-01) and 62nd (2005-06) rounds. The NSSO had followed different National Industrial Classification (NIC) in its various rounds.[3] To enable comparison across rounds, we reclassified the nineteen two digit industries into 14 industry groups following the NIC 1987.[4] The analysis is conducted at the aggregate 'all industries' level as well as at the disaggregate two-digit industry level.

Variables

Gross value added (GVA) is used as a proxy for output. The implicit deflators of gross domestic product of the unregistered manufacturing sector available at the two-digit industry group level are used to deflate GVA at the industry level. Total number of persons engaged is used as a measure of labour input. We have used the total fixed assets as given in the NSSO reports to represent capital input in the sector. The absence of data on fixed capital formation at the industry level led us to use gross fixed capital stock formation by unregistered manufacturing sector at the all India level to deflate gross fixed assets and compute value of capital at 1993-94 prices.

The informal manufacturing sector comprises three types of enterprises, namely, Own Account Manufacturing Enterprises (OAMEs), Non-Directory Manufacturing Enterprises (NDMEs), and Directory Manufacturing Enterprises (DMEs). OAMEs employ only family labour while NDMEs and DMEs employ hired labour. The number of workers is less than six in the case of NDMEs and more than or equal to six in the case of DMEs. We arrived at the total number of enterprises by adding the number of enterprises in each of these three enterprise types.

[3] The 33rd and 40th rounds provide data as per NIC 1970, 45th and 51st rounds follow NIC 1987 and the 56th round and 61st round as per NIC 1998. While concordance of NIC 1987 with NIC 1970 required only the interchanging of divisions 30 and 31, matching of NIC 1987 with NIC 1998 requires a greater degree of approximation by relevant grouping. The exact concordance between 2-digit industry groups of NIC 1987 with that of NIC 1998 requires data on 3- and 4-digit industrial divisions.

[4] Details of 15 industry groupings clubbed for the purpose of this study are given in Raj (2006).

Table 1: Trend in Enterprises, Employment and Gross Value Added

Year	Number of Enterprises (in million)	Employment (in million)	Gross value Added (in Rs. Billion)
1984-85	17.70	34.28	238.45
1989-90	14.32	32.72	237.11
1994-95	12.30	29.53	244.84
2000-01	17.02	37.09	424.79
2005-06	17.07	36.44	511.00

Source: Source: NSSO (1989, 1995, 1998, 2002, 2002a, 2007); CSO (1985, 1995).

Table 2: Employment per Enterprise by Enterprise Type

Employment per enterprise						
Sector	Type	Year				
		1984-85	1989-90	1994-95	2000-01	2005-06
Rural	OAME	1.69	1.78	1.95	1.73	1.62
	NDME	2.33	3.00	2.76	3.07	3.20
	DME	11.18	12.37	8.34	11.76	11.13
	ALL	1.86	2.06	2.20	2.01	1.93
Urban	OAME	1.53	1.88	1.92	1.64	1.62
	NDME	2.25	3.46	3.45	3.35	3.31
	DME	9.29	10.73	8.94	8.88	9.49
	ALL	2.19	3.08	3.04	2.57	2.63
Total	OAME	1.66	1.80	1.94	1.71	1.62
	NDME	2.29	3.23	3.12	3.25	3.26
	DME	10.03	11.41	8.66	9.98	10.14
	ALL	1.94	2.29	2.40	2.18	2.13

Source: Same as Figure 1.

Table 3: Fixed Capital Stock per Enterprise by Enterprise Type

Fixed Capital Stock per enterprise (‘00s)						
Sector	Type	Year				
		1984-85	1989-90	1994-95	2000-01	2005-06
Rural	OAME	265	75	84	116	105
	NDME	498	441	476	578	678
	DME	627	817	1107	2102	2168
	ALL	286	111	141	181	187
Urban	OAME	573	249	308	322	326
	NDME	754	1454	1310	1557	1576
	DME	892	1111	3827	4355	4524
	ALL	633	583	922	902	937
Total	OAME	326	105	127	167	158
	NDME	623	946	915	1197	1198
	DME	788	989	2550	3494	3585
	ALL	369	215	329	396	404

Source: Same as Figure 1.

Table 4: Rural Share in Enterprises, Employment, Fixed Capital Stock and Gross Value Added

Year	Rural share in total enterprises				Rural share in total employment				Rural share in fixed capital stock				Rural share in gross value added			
	OAME	NDME	DME	ALL	OAME	NDME	DME	ALL	OAME	NDME	DME	ALL	OAME	NDME	DME	ALL
1984-85	80.1	51.1	39.1	76.0	81.6	52.0	43.5	72.8	65.1	40.9	31.1	58.9	70.5	28.9	19.5	45.2
1989-90	82.4	50.1	41.4	78.0	81.7	46.5	44.9	70.3	58.5	23.3	34.1	40.3	72.3	30.0	28.3	47.2
1994-95	81.1	47.3	46.9	75.9	81.3	41.8	45.2	69.5	54.0	24.6	20.4	32.5	65.5	27.9	27.8	43.0
2000-01	75.4	36.8	38.2	70.1	76.4	34.8	45.0	64.7	52.4	17.8	23.0	32.0	66.1	24.5	31.3	44.3
2005-06	76.0	42.1	39.9	71.0	76.1	41.3	43.7	64.4	50.4	23.8	24.1	32.8	66.8	30.6	30.0	42.8

Table 5: Share in Number of Enterprises, Employment and Gross Value Added in the Indian Informal Manufacturing Sector by Enterprise Type

Number of Enterprises						
Sector	Type	Year				
		1984-85	1989-90	1994-95	2000-01	2005-06
Rural	OAME	91.5	92.2	90.6	92.7	91.6
	NDME	7.2	5.8	6.3	5.3	6.1
	DME	1.3	2.0	3.1	2.1	2.3
	ALL	100.0	100.0	100.0	100.0	100.0
Urban	OAME	71.8	69.5	66.7	70.9	70.9
	NDME	21.7	20.6	22.1	21.3	20.7
	DME	6.5	9.9	11.2	7.9	8.4
	ALL	100.0	100.0	100.0	100.0	100.0
Total	OAME	86.8	87.2	84.8	86.1	85.6
	NDME	10.7	9.1	10.1	10.1	10.4
	DME	2.6	3.7	5.1	3.8	4.0
	ALL	100.0	100.0	100.0	100.0	100.0
Number of Workers						
Sector	Type	Year				
		1984-85	1989-90	1994-95	2000-01	2005-06
Rural	OAME	83.1	79.6	80.2	79.8	76.8
	NDME	9.0	8.5	7.9	8.1	10.2
	DME	7.9	11.9	11.9	12.1	13.0
	ALL	100.0	100.0	100.0	100.0	100.0
Urban	OAME	50.2	42.3	42.0	45.2	43.6
	NDME	22.3	23.1	25.1	27.7	26.1
	DME	27.5	34.5	32.9	27.1	30.2
	ALL	100.0	100.0	100.0	100.0	100.0
Total	OAME	74.1	68.6	68.5	67.6	65.0
	NDME	12.6	12.8	13.2	15.0	15.9
	DME	13.2	18.6	18.3	17.4	19.1
	ALL	100.0	100.0	100.0	100.0	100.0
Gross Value Added						
Sector	Type	Year				
		1984-85	1989-90	1994-95	2000-01	2005-06
Rural	OAME	71.3	64.5	61.4	63.0	53.7
	NDME	16.2	15.1	14.8	13.8	18.6
	DME	12.5	20.4	23.9	23.1	27.7
	ALL	100.0	100.0	100.0	100.0	100.0

Urban	OAME	24.6	22.1	24.4	25.8	20.0
	NDME	32.8	31.5	28.8	33.9	31.5
	DME	42.6	46.3	46.8	40.3	48.5
	ALL	100.0	100.0	100.0	100.0	100.0
Total	OAME	45.7	42.1	40.3	42.3	34.4
	NDME	25.3	23.8	22.8	25.0	26.0
	DME	29.0	34.1	37.0	32.7	39.6
	ALL	100.0	100.0	100.0	100.0	100.0

Source: Same as Figure 1.

Table 6: Share of Organic Industries in number of Enterprises, Employment and GVA

Year	Number of Enterprises			Employment			Gross Value Added		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
1984-85	85.6	78.8	84.0	84.1	75.7	81.8	84.0	62.3	72.3
1989-90	84.2	71.6	81.4	80.0	62.5	74.8	78.2	61.6	69.8
1994-95	80.2	65.3	76.6	77.1	63.0	72.8	75.1	54.5	63.3
2000-01	85.6	73.3	81.9	80.1	67.9	75.8	69.6	58.4	63.3
2005-06	86.4	75.3	83.2	81.5	68.6	76.9	74.9	57.1	64.7

Source: Same as Figure 1.

Table 7: Share in Number of Enterprises, Employment and GVA by Sector and Industry (per cent)

Industry	Year	Number of Enterprises			Employment			Gross value added		
		Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Manufacture of food products	1984-85	19.4	15.5	18.5	20.9	14.6	19.2	20.3	16.7	18.3
	1989-90	18.8	14.5	17.8	19.8	12.1	17.5	23.3	14.3	18.7
	1994-95	20.9	15.0	19.5	21.8	13.1	19.1	25.6	12.4	18.0
	2000-01	18.3	12.0	16.4	20.1	12.1	17.3	22.0	11.4	16.0
	2005-06	15.1	10.0	13.6	19.0	10.1	15.8	21.9	10.4	15.3
Manufacture of beverages and related products	1984-85	7.8	7.4	7.7	7.5	6.3	7.2	6.9	2.7	4.6
	1989-90	14.6	13.4	14.3	12.2	7.8	10.9	7.9	2.6	5.2
	1994-95	12.3	9.5	11.6	10.4	6.1	9.1	7.8	2.4	4.7
	2000-01	15.2	9.7	13.5	12.8	5.8	10.3	6.9	1.6	3.9
	2005-06	21.4	10.3	18.2	16.8	6.6	13.1	7.5	1.6	4.1
Manufacture of cotton textiles, wool, silk and jute products	1984-85	16.4	13.7	15.7	22.5	18.3	21.3	13.6	11.4	12.4
	1989-90	11.9	16.3	12.9	12.7	17.6	14.1	9.3	14.8	12.1
	1994-95	9.9	11.0	10.2	11.8	13.6	12.4	12.0	10.1	10.9
	2000-01	7.1	8.1	7.4	8.7	11.1	9.5	7.4	9.8	8.8
	2005-06	5.4	8.8	6.4	6.6	13.0	8.9	7.6	10.8	9.4
Manufacture of textile products (including wearing apparel)	1984-85	19.2	25.7	20.8	14.8	20.3	16.3	13.8	12.9	13.3
	1989-90	8.4	8.6	8.4	8.9	8.2	8.7	6.4	7.2	6.8
	1994-95	9.1	8.1	8.9	10.2	10.6	10.3	8.6	9.9	9.4
	2000-01	21.1	28.6	23.3	17.1	24.1	19.5	17.6	21.3	19.7
	2005-06	25.2	33.1	27.4	20.6	24.7	22.0	18.3	18.5	18.4

Manufacture of wood and related products	1984-85	19.6	10.9	17.5	16.2	9.7	14.4	25.3	10.8	17.5
	1989-90	27.9	12.2	24.5	24.5	9.4	20.0	29.3	13.0	21.0
	1994-95	26.1	14.6	23.3	21.2	11.5	18.3	19.4	11.6	14.9
	2000-01	22.7	9.5	18.7	20.3	8.3	16.1	14.3	6.6	10.0
	2005-06	18.0	7.6	15.0	17.2	7.2	13.6	17.8	7.9	12.1
Manufacture of non-metallic mineral products	1984-85	6.8	3.2	5.9	9.1	3.7	7.6	7.1	2.1	4.4
	1989-90	7.5	3.7	6.6	10.4	4.5	8.7	8.7	3.2	5.9
	1994-95	8.0	3.7	6.9	10.9	3.9	8.8	12.5	2.2	6.6
	2000-01	5.8	2.6	4.8	10.7	3.7	8.2	16.3	3.4	9.0
	2005-06	4.4	2.1	3.8	8.4	2.9	6.4	10.3	2.3	5.7
Manufacture of metal products and parts	1984-85	3.3	3.5	3.4	2.9	3.5	3.0	4.5	11.3	8.2
	1989-90	2.2	5.8	3.0	2.2	6.6	3.5	3.1	8.9	6.0
	1994-95	2.7	6.8	3.7	2.5	8.7	4.4	3.7	11.2	8.0
	2000-01	3.1	5.3	3.8	2.8	6.9	4.3	4.5	9.8	7.5
	2005-06	4.1	8.5	5.3	4.0	12.4	7.0	6.2	20.1	14.2
Other manufacturing industries	1984-85	3.0	8.4	4.3	2.7	7.6	4.0	1.9	4.3	3.2
	1989-90	4.4	10.7	5.7	5.1	9.9	6.5	4.4	10.4	7.5
	1994-95	7.4	15.9	9.4	7.7	13.4	9.5	4.9	15.1	10.7
	2000-01	3.2	11.6	5.7	3.5	11.0	6.1	4.3	11.9	8.6
	2005-06	2.2	9.6	4.3	2.7	10.8	5.6	4.5	14.1	10.0
Miscellaneous Industry Group*	1984-85	4.3	9	5.5	3.2	12.4	5.8	6.1	23.4	15.5
	1989-90	4.1	10.4	5.4	3.8	18.4	8	6.9	17.6	12.4
	1994-95	3.1	11.4	5.1	2.8	14.6	6.3	4.8	20	13.4
	2000-01	3.2	9	4.9	3.5	12.3	6.5	5.8	19	13.4
	2005-06	4.2	10.0	5.9	4.8	12.4	7.5	5.9	14.4	10.7

*Miscellaneous industry group includes industries producing paper products, leather products, chemical products, rubber, plastic and coal products, metal and alloy products, machinery and parts and transport equipment and parts. Full table is available from the authors upon request.
Source: Same as Figure 1.

Table 8: Classification of Industries based on Extent of Concentration in Rural Areas

Category	Description	1984-85	1989-90	1994-95	2000-01	2005-06
Vastly Rural (VR)	≥80 per cent employment in rural areas	Wood, non-metallic minerals	Wood, non-metallic minerals	Wood, non-metallic minerals	Beverages, wood, non-metallic minerals	Beverages, wood, non-metallic minerals
Mainly Rural (MR)	50-80 per cent employment in rural areas	Food products, beverages, cotton, textiles, leather products, metal products	Food products, beverages, cotton, textiles, leather products, chemicals, other products, metal products	Food products, beverages, cotton, textiles, others	Food products, cotton, textiles, chemicals	Food products, textiles, chemicals
Mainly Urban (MU)	30-50 per cent employment in rural areas	Transport, other products	Metal products	Leather products, chemicals, metal products	Leather products, rubber products, basic metal and alloy, metal products, other products	Cotton, Paper products, rubber products, metal products, transport and other products
Vastly Urban (VU)	<30 per cent employment in rural areas	Paper products, chemicals, rubber products, basic metal and alloys, machinery	Paper products, rubber products, basic metal and alloys, machinery, transport	Paper products, rubber products, basic metal and alloys, machinery, transport	Paper products, machinery, transport	Leather products, basic metal nd alloys

Table 9: Sunrise and Sunset Industries in the Indian Informal Manufacturing Sector

Category	Category	Description	1984-90	1990-95	1995-2001	2001-2006
Sunrise Industries	Category A	Growth in employment, growth in GVA, growth in labour productivity	Paper products, non-metallic minerals, other products	Textiles, rubber products, metal products, other products	Food products, textiles, paper, chemicals, non-metallic minerals, basic metal &alloy, metal products, machinery, transport	Beverages, textiles, paper, leather products, chemicals, metal products, transport
	Category B	Decline in employment, growth in GVA, growth in labour productivity	Food products, cotton, rubber products	Leather products, non-metallic minerals, other products	Cotton, leather products, other products	Food products, cotton, wood products, non-metallic minerals, basic metal, Other products
Sunset Industries	Category C	Growth in employment, growth in GVA, decline in labour productivity	Beverages, wood products, chemicals, basic metal		Beverages, wood products, rubber products	
	Category D	Employment decline, GVA decline, labour productivity decline	Leather products	Food products, wood products, paper products, chemicals		
	Category E	Growth in employment, decline in GVA, decline in labour productivity	Metal products, machinery, transport			
	Category F	Decline in employment, decline in GVA, growth in labour productivity	Textiles	Beverages, cotton, basic metal and alloys, transport		Rubber products

Table 10: Number of Sunrise and Sunset Industries in Organic and Inorganic Industry Groups

Category	1984-90		1990-95		1995-2001		2001-2006	
	Organic	Inorganic	Organic	Inorganic	Organic	Inorganic	Organic	Inorganic
Category A	Paper	Non-metallic minerals, other products	Textiles	Rubber products, metal products, other products	Food products, textiles, paper	Chemicals, non-metallic minerals, basic metal & alloy, metal products, machinery, transport	Beverages, textiles, paper, leather products	Chemicals, metal products, transport
Category B	Food products, cotton	Rubber products	Leather products	Non-metallic minerals, other products	Cotton, leather products	Other products	Food products, cotton, wood products	Non-metallic minerals, basic metal, other products
Number of sunrise industries	3	3	2	5	5	7	7	6
Category C	Beverages, wood products	Chemicals, basic metals			Beverages, wood products	Rubber products		
Category D	Leather products		Food products, wood products, paper products	Chemicals				
Category E		Metal products, machinery, transport						
Category F	Textiles		Beverages, cotton	Basic metal and alloys, transport				Rubber products
Number of sunset industries	4	5	5	3	2	1	0	1

Table 11: Trends in Labour Growth in the Indian Informal Manufacturing Sector

Industries	Labour productivity growth (LPG)			
	1984-90	1990-95	1995-2001	2001-2006
Manufacture of food products	3.8	-1.5	3.5	13.2
Manufacture of beverages and related products	-4.5	2.5	-0.3	6.7
Manufacture of cotton textiles, wool, silk and jute products	9.6	2.7	5.0	13.7
Manufacture of textile products (including wearing apparel)	0.7	1.1	8.5	7.6
Manufacture of wood and related products	-1.4	-3.8	-0.8	20.5
Manufacture of paper and paper products	2.8	-2.7	1.5	11.6
Manufacture of leather and leather products	-9.1	11.2	4.6	9.9
Manufacture of basic chemicals and chemical products	-8.6	-3.1	2.1	6.3
Manufacture of rubber, plastic, petroleum and coal products	19.0	1.0	-1.1	2.9
Manufacture of non-metallic mineral products	4.6	3.7	10.0	7.7
Basic metal and alloy industries	-23.7	32.5	3.9	15.1
Manufacture of metal products and machinery	-5.7	3.6	4.0	11.2
Manufacture of transport equipment and parts	-25.8	0.5	3.1	9.7
Other manufacturing industries	9.0	1.6	7.5	16.8
Average LPG	-2.1	3.5	3.7	10.9

Source: Same as Figure 1.

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Building a Globally Competitive Environment for Medium, Small and Micro Enterprises

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Given the poor performance of the organised manufacturing sector, micro, small and medium sector can play a critical role in development. India needs to facilitate the emergence of a vibrant system so that the sector can thrive in a competitive global environment and create employment opportunities. Given the link between innovation and international competitiveness, a related challenge is to integrate, as explicitly as possible, innovation system concerns into the trade and investment policy framework.

A little more than two decades ago, more precisely with the new industrial policy of July 1991, the state seems to have almost taken its hands off the industrial steering wheel. Market forces were expected to help evolve a regionally balanced, technology dynamic and internationally competitive industrial sector for the county for employment generation, output expansion and foreign exchange earnings. The remarkable performance of certain sectors like software which was attributed to the "benign state neglect" (Arora et.al 2001)[1] provided the empirical support for such a strategy apart from the consensus from the developed bloc on the role of service sector in rapid economic growth.

This strategy has not succeeded in delivering the expected outcomes. While the country managed to increase its share of manufacturing in GDP from about 9 per cent in 1950-51 to 16 per cent in 1991, its share has remained almost flat since then until today. While countries like China forged ahead with a fast growing and internationally competitive manufacturing sector accounting for nearly 35 per cent of the GDP and flooded the world market with its manufactured products, India remained a passive spectator. True, one could locate a few dynamic sectors and a few sub periods of high growth in manufacturing since 1991 but the observed growth was characterised by poor record in employment generation both in terms of quantity (Nagaraj 2000) and quality (Uma et al 2010). In a context where the fastest growing service sector contributes 65 per cent of

[1] For a critical view highlighting the role of the state se Joseph (2002)

the GDP but only about 36 per cent of the employment for achieving inclusive growth, the policy makers have limited options other the industrial sector.

The 12th Five Year plan for the industrial sector aims at increasing manufacturing sector growth to 12 to 14 per cent over the medium term to make it the engine of growth for the economy and enable the manufacturing sector to contribute at least 25 per cent of the GDP by 2025. It also aims at increasing manufacturing job creation of the order of 100 million through increasing the depth of manufacturing by focusing on greater domestic value addition (Government of India un-dated). The plan recognizes that the achievement ambit of these laudable objectives in a globalised context is possible only through enhancing international competitiveness.

If past experience is any indication, the organised manufacturing sector can at best play a peripheral role in helping realise the objectives of the plan. The organised manufacturing sector in the country has been known for its jobless growth (Goldar 2000) inter alia on account of low domestic value addition. Neither are the multinationals of much help in generating employment and value addition as they are often driven by maximising growth and profitability at the global level where employment and value addition in a specific country might be inimical to their own interests. Given this, the key candidate that could help address the three national concerns turns out to be the Micro, Small and Medium Enterprise (MSME). The moot question is how are they placed today to discharge these national mandates?

MSMEs and State's Response

The MSMEs, comprising 26 million units engaged in the manufacture of over 6,000 products, generates 60 million employment 8 per cent of GDP, 45 per cent of manufacture output and 40 per cent of exports during 2006-07(Government of India 2011). Operating under the liberalized and globalised environment they have been faced with de-reservation of products and de-licensing leading to intense competition with the large scale sector from within the country. Further, the removal of tariff barriers under globalization along with different Regional Trading Trade Agreements (RTAs) and Free Trade Agreements (FTAs) that the Country has entered into implied the replacement of the earlier regime of infant industry production with open competition with foreign firms. However, some of the firms operating in select industries have managed to get access to the global market inter alia through their participation in the global production network. To the extent that such integration is governed primarily by the global considerations of MNCs it would have had its adverse effect on the domestic value addition and employment generation.

To what extent can the MSMEs sector withstand the heightened competition unleashed after globalization? The answer does not appear very encouraging because of the growing morbidity and mortality of MSMEs. Provisional figures quoted by the Government of

India (2013) from the data published by the Reserve Bank of India (RBI), show that the total number of sick units stands at 2.5 lakhs in 2013.

The poor health of the MSME sector in general is no revelation for India's policy makers. The state, among other things, considering their potential, for the generation of employment and achieving balanced regional development while contributing to the foreign exchange earnings, had taken a highly proactive role in addressing their concerns. Even when the industrial sector in the country was almost off the policy radar, the State seems to have maintained its keen interest in nurturing the MSMEs – an approach traceable to the days of National Planning Committee (1938-41) according to Tyabji (1980). This is evident from the fact that apart from the Inter-Ministerial Committee (Government of India 2013) that submitted its report in October 2013, six high level Committees where appointed by the Central Government since 1991 to study the varied issues confronted by the small scale sector. (For details please see the Prime Ministers taskforce of MSMEs (2010)). In addition, the National Commission for Enterprises in the Unorganized Sector (NCEUS) was appointed in September 2004 to examine issues specific to the unorganized sector. Over and above, the Prime Minister appointed a taskforce in 2010 which made wide ranging recommendations on all the aspects of concern for the MSMEs. This Task Force also recommended the establishment of Prime Minister's council on MSMEs in the Prime Minister's office. Perhaps, more could not have been done.

Following the recommendations of these committees various institutional interventions were initiated at the instance of the state. Das (2011) argued that persistent initiatives of influential global agencies such as the United Nations Industrial Development Organisation (UNIDO), International Labour Organisation (ILO), United Nations Conference on Trade and Development (UNCTAD), World Bank, Organisation for Economic Co-operation and Development (OECD) and so on, the so-called cluster development programmes were deeply neoliberal in their basic strategies. The numerous policy measures by the state aimed at promoting their competitiveness by addressing the basic concerns relating to technology, finance and marketing. The primary objective of the SSI policies during the 1990s was to impart more vitality and growth-impetus to the sector to enable them to contribute to the economy, particularly in terms of growth of output, employment, and exports. Thus the Government of India introduced the Micro, Small and Medium Enterprises Development Act, 2006. This particular Act made a case for small firms towards external orientation and to be globally competitive. The objective of this policy makes clear that though employment generation continued as the primary objective, SSIs were expected to achieve this objective by attaining competitive strength and economic viability.

The central government of India directly operates a remarkably large system for assistance for the MSMEs in various business and technical aspects throughout the country. One

of the policy initiatives by the GOI announced was to set up a National Manufacturing Competitiveness Council to support SSIs to become competitive. The council was set up to promote interventions relating to technology upgradation, marketing and sales promotion strategy and skill upgradation, focusing on selected modern sectors/clusters having the potential of participating in the global market.

The Ministry of MSMEs set up Technology Resource Centres (TRCs) and Small Industry Services Institutes (SISIs) to help SSIs to upgrade and modernize technology and to provide information on latest technologies. The ministry also has Product-cum-Process Development Centres (PPDCs) to promote R&D, product design and innovation, product and process improvement and development of improved packaging techniques, common facility centre and manpower development and training.

In case of strategies to promote exports, the small-scale sector has been accorded a high priority in India. Apart from the number of incentives and facilities to SSIs, the following schemes are in operation for achieving high growth in exports. The office of Development Commissioner (DC-MSME) since 1985[2] has a scheme for facilitating participation in international fairs; wherein MSME entrepreneurs are encouraged to display their products. The scheme offers funding for participation in international fairs/ exhibitions, study tours abroad, trade delegations, publicity. It is a purely promotional scheme to give exposure to the products of MSMEs which otherwise are not in a position to participate in the exhibitions/ fairs at their own cost.

In order to enhance the competitive strength of the SSIs, Ministry of MSMEs introduced an incentive scheme for their technological upgradation/ quality improvement and environment management. The scheme provides incentives to those small-scale/ ancillary undertaking who have acquired ISO 9000/ ISO 14001/ HACCP certifications.[2] The scheme envisages one time reimbursement of charges for acquiring these certificates to the extent of 75 per cent of the expenditure.

Whither Innovation?

Ever since the pioneering works of scholars like Ponser (1961) driven by the Leontief Paradox, the relation between technology and trade has become a fertile field of research. Much of the earlier studies, in the neoclassical framework treated technology as exogenous, and were concerned with the how technology shapes the pattern of trade and human welfare. Subsequent studies, by endogenizing technological change, explored not only how technology affects trade, but also how trade affects the evolution of technology (see Grossman and Helpman 1995 for a survey). It is by now generally recognized that in the globalised world without tariff barriers there is hardly any easy option for the enterprises to survive other than being internationally competitive. In tune

[2] http://www.dcmsme.gov.in/schemes/sciso9000.htm (DC-MSME, 2013).

with the global trend in India there have been a number of studies, mostly focusing on the role of innovation in shaping international trade in manufacturing sector in general (Kumar and Sidharthan 1994, Sidharthan and Nollen 2004) and MSMEs in particular (Bhavani 2002: 2009; Pradhan 2010 among others.)[3]

In most of these studies technological change is represented by research and development while some of them have also considered the import of technology, both in embodied and disembodied form. Disenchanted with the neoclassical paradigm that places an analytical focus on concepts like scarcity, allocation and exchange (market) in a static context, and considering theories in social sciences as focusing devices, Freeman (1987), Lundvall (1992) and Nelson (1993) made considerable contribution towards evolving the concept of National Innovation System (NIS) building on the work of Frederich List (1841). The concept was enriched by drawing insights from evolutionary economics, structuralists and theories on the economics of knowledge and appreciating the dangers of considering R&D on par with innovation in the manner of GDP growth with development in traditional development economics. Common for these contributions is that they deviated from the linear approach to technological progress (invention-innovation diffusion) and regarded innovation as an interactive and evolutionary process at micro, meso and macro level as a driving force behind growth and development. Thus viewed they went beyond the narrow confines of product and process innovation and considered innovation as a process involving different actors in an evolutionary manner emphasizing the inter-dependence and non-linearity wherein institutions playing the central role (Joseph 2006; Edquist 1997).[4] The literature was further enriched by the subsequent developments focusing on systems of innovation at regional (Asheim and Gertler 2004), local (Lastres and Cassiolato 2005), sectoral (Malerba 2004) and technological (Carlsson and Stankiewitz 1995) levels. Much of this work has been based on the evidence from developed countries.[5]

The innovation system perspective has emerged as the most widely used approach in innovation studies published during the last two decades (Fagerberg and Sapprasert 2011). Of late this perspective has found acceptance in India's policy circles as well as with multilateral organisations like UNCTAD, OECD, the World Bank and others. The strategy paper prepared by the Office of the Advisor to the Prime Minister (2011) states "while we do need to increase R&D investment and efforts, this view of innovation is based on a myopic perception that restricts it to the confines of formal R&D".

[3] For a recent contribution this issue, the interested readers are directed to Innovation and global competitiveness: case of India's manufacturing sector, Innovation and development Vol 3 No.2, Guest edited by N.S. Sidharthan and K. Narayanan (2013) Vol 3. No.2.

[4] For a growing number of studies on Innovation systems, the readers are referred to www.globelics.org

[5] For treatment of this issue from the developing country perspective please see Lundvall et al (2009).

To what extent has this been taken into actual policy implementation towards shaping the innovation and competitiveness of MSMEs?

Some evidence

A sound data base on MSMEs, which is a precondition for informed policy making, is yet unavailable in India. Though India has undertaken four censuses thus far on the small scale sector, the data gathered during different surveys is hardly comparable because of the lack of a uniform conceptual frame. More importantly, information on some crucial factors like the use of ICT, import of embodied technology in the form of capital goods is yet to be collected. Surprisingly, for unknown reasons, certain minimum information of relevance at present (whether the unit has a computer) gathered during the third survey has been dropped in the fourth census.

Based on the data obtained from the fourth census of MSMEs we have estimated select indicators of international competitiveness by classifying the industries in terms of their technological intensity as per OECD (2011). We have also gathered information on select indicators of interactive learning although the available data base doesn't permit us to reflect on a wide range of interactions that are important and also the content of observed interactions.

In what follows we shall make a very preliminary attempt at relating different indicators of competitiveness with the four different types on interactions (1) interactions with foreign concerns (2) domestic collaborating companies (3) domestic R&D institution/ specialised agency (4) none (see table 1). Needless to say, it is important to incorporate the role of R&D. Unfortunately such information is not gathered during the survey. Earlier studies based on the data obtained from the company level information published by the Centre for Monitoring Indian Economy have highlighted the poor R&D performance of MSMEs. The incidence of R&D (units undertaking R&D) is found to be very low and the R&D intensity (R&D expenditure as a proportion sales) declined in the 2000s as compared to 1990s (Pradhan 2010).

Table1: International competitiveness and interactive learning by MSMEs,2006-07 (per cent)
Select Indicators

Industry groups	Indicators of International competitiveness			Interactions with			
	Share of exporting units	Export intensity	Export share	Actors Abroad	Domestic Collaborating company/ unit	Domestic R&D institution/ specialized agency	None
Low-tech	3.07	33.01	59.94	1.77	4.14	5.42	88.67
Medium low	3.11	18.96	18.15	1.93	4.89	8.19	84.99
Medium high	4.12	19.65	15.92	1.96	5.59	8.26	84.20
High-tech	6.92	28.22	5.99	1.94	6.09	10.39	81.57
Total	3.34	26.35	100.00	1.84	4.56	6.53	87.08

Source: Estimate based on the data obtained from the OECD (2011)

From Table 1 we see that the incidence of exports measured in terms of the proportion of firms engaged in exports is at a very low level (3.3 per cent). However, it increases as we move from low technology industries (3.0) to high technology industries (6.9). Export intensity is found to be higher in case of low technology industries and they account for nearly 60 per cent of the total exports. As in the incidence of exports, the incidence of engagement in interactive learning, though could not be captured in its entirety from the data base, is also found to be at a low level. On an average 87 per cent of the firms are not engaged in any of the interactive learning activities.

In this context, a recent study has argued that while India is home to a large number of natural industrial clusters dominated by SMEs, and subcontracting has been systematically promoted through varied policy initiatives, learning, innovation and competence building systems as articulated in the National Innovation System framework is yet to evolve in its real sense (Das and Joseph, 2013). On the whole it appears that the low international competitiveness of India's MSME is linked with the very low levels of R&D coupled with inertia for interactive learning, the key elements of a vibrant innovation system, which in turn stands in the way of building an internationally competitive MSME sector. The key issue is to facilitate the emergence of a vibrant learning, innovation and competitive building system such that India's MSME's are enabled to survive in the current context of heightened international competition and emerge as key sectors in generating value added and employment as envisaged in the 12th Five Year Plan. Given the link between innovation and international competitiveness, a related challenge for the policy-makers is to integrate, as explicitly as possible, the innovation system concerns into the trade and investment policy framework.

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‘Hollowing-Out’ of India’s Manufacturing Sector
Role of International Trade

Rashmi Banga
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The declining share of the Indian manufacturing sector in GDP and total exports; declining employment elasticities, and rising imports provide sufficient evidence of the hollowing-out of the Indian manufacturing sector. Building strong domestic value chains within the economy is necessary to be able to ‘gainfully’ link into global value chains. Incentivising domestic firms to procure domestically in order to develop their domestic input industry can boost global competitiveness of many manufacturing industries.

Manufacturing has always been a sector of concern for India due to its sticky growth rates and persistently low contribution to total output and employment in the economy. The sector’s decadal average growth rates have remained less than 6 per cent right from 1950s to 1990s. While the sector experienced a slight rise in its average growth rate to 8 per cent in the decade of 2000,its performance since then has been worsening with its growth rates declining from 9.7 per cent in 2010-11 to 2.6 per cent in 2011-12 and 1.8 per cent in 2012-13[1] . In FY13, only 3.3 per cent of the country’s growth was generated by manufacturing sector.

Due to its slow growth, the sector has been unable to provide the much needed structural transformation of the economy. Its contribution to GDP has remained stuck between 14-16 per cent since 1980s and in 2012-13 it is still contributing 15 per cent of GDP. This appears to be extremely low when compared to other developing countries like China (34 per cent), Thailand (40 per cent) and Malaysia (24 per cent). The sector’s contribution to total employment in the period 2000-09 has been only around 12 per cent with its employment elasticity declining from 0.76 in the first half of 2000s to -0.31 in the second half.[2] The sector has also played a negligible role in labour productivity growth in India. In the decade of 2000, manufacturing in India contributed

[1] Central Statistical Organisation (CSO), also see Data Book for Deputy Chairman, Planning Commission; 3rd May, 2013

[2] NSSO 61st and 66th Round Survey (2009-10); Working Group on Twelfth Plan - Employment, Planning & Policy

only 6 per cent to total labour productivity growth as compared to 32 per cent in China and 68 per cent in Malaysia.[3]

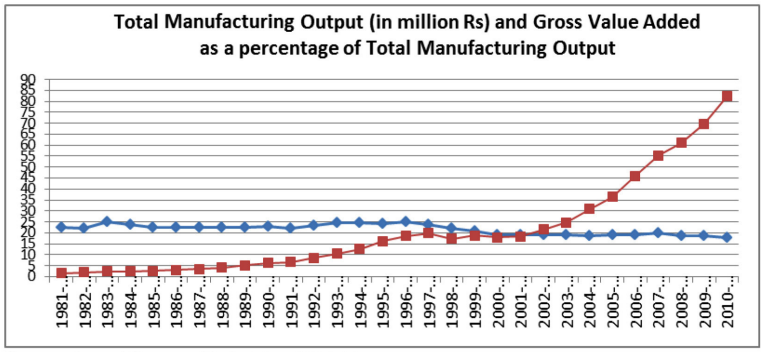
The dismal performance of manufacturing sector on all fronts raises some potent questions:

1. Is Indian manufacturing sector *hollowing-out?*
2. Are the growth challenges to manufacturing sector in India unique?
3. Are specific policies being formulated to target specific constraints to manufacturing sector's growth?
4. To what extent has international trade been responsible for *hollowing-out* of Indian manufacturing?
5. Have global value chains played a role in this *hollowing- out?*

Is India's Manufacturing Sector 'Hollowing-Out'?

Hollowing-out occurs when domestic value-addition represents a diminishing share of total output. Indian manufacturing sector has been experiencing a rising output but diminishing value- added in total output with the trend becoming more pronounced since mid-1990s. (Figure1). Value-added in total manufacturing output declined from around 25 per cent in mid-1990s to 18 per cent in 2010-11. The rise in manufacturing output with falling manufacturing value-added could be explained by rising resource intensity of manufacturing sector which would imply rising fuel consumption. However, fuel consumption has steadily declined as a proportion of manufacturing inputs, i.e., from an average 11 per cent in 1980s to 6 per cent in 2000s.

Figure 1: Manufacturing Output and Gross Value Added in Manufacturing



Source: *Annual Survey of Industries, 2010-11*

Not only did the real value-added growth declined for the aggregate manufacturing sector from an average annual growth of 11 per cent in 1990s to 9 per cent in 2000-08,

[3] Asian Productivity Databook, 2013, Asian Productivity Organisation

this decline was seen in a number of disaggregated manufacturing industries (Table 1). It is to be noted that the period considered is before the global economic slowdown.

Table 1: Average Annual Growth in Real Value Added in Organised Manufacturing Sector

	Average Annual Growth of real value-added in 1990s	Average Annual Growth in real value-added in 2000-2008
Furniture & other manufacturing n.e.c.	29.7	13.0
Electrical machinery and apparatus, n.e.c	15.8	12.3
Wearing apparel, dressing & dyeing of fur	15.5	9.0
Textiles products	12.8	8.0
Machinery and equipment n.e.c.	14.0	7.1
Non-metallic mineral products	9.5	7.1
Chemicals and chemical products	10.1	3.8
Basic metals	17.5	3.3
Radio, television and communication equipment	14.8	1.8
Tobacco & related products	7.7	-1.4
Rubber and plastic products	8.5	-2.0
Others	10.1	8.5
Total manufacturing	11.5	8.7

Note: Average annual growth rates of value added are calculated from Annual Survey of Industries. Double Deflation method is used. 2000s is 2000-01 to 2008-09.

The declining real value-added growth in manufacturing industries accompanied by declining share of the sector in GDP and total exports and falling employment elasticity strongly suggests that Indian manufacturing sector is hollowing-out. Falling value-added growth can hamper industrialisation process immensely in an economy. Even if manufacturing output grows and exports rise, unless domestic value-added rises, there will be no commensurating production-linked gains like employment generation, technology up gradation, skill development, etc. Declining value-added growth can lead to a stage where the industries will need to increase their imports of inputs; they will not add much value to their exports and slowly hollow-out.

Are Growth Challenges to Manufacturing in India Unique?

The manufacturing sector in India has some unique features which makes its challenges more daunting. There exists a large unorganised/informal manufacturing sector in India which contributes around 85 per cent of total employment. Organised manufacturing is able to provide employment to only 15 per cent of those employed in manufacturing, of which 51 per cent are 'informally' employed and do not enjoy job and social security (NSSO, 2009-10). Thus, 92 per cent of those employed in manufacturing sector are in

'informal' employment. Nevertheless, contribution of organised manufacturing sector to GDP with only 8 per cent of formal employment is 78 per cent.

Along with large 'in-formalisation' of manufacturing, there exists another dual structure within manufacturing. This is the existence of small and large firms with 'missing-middle' or medium-sized firms. According to ADB (2009) almost 84 per cent of total manufacturing employment in India is in micro and small enterprises with only 6 per cent employed in middle-sized firms (with 50-199 workers). In contrast, middle-sized firms employ 20 per cent in China, 20 per cent in Malaysia and 23 per cent in Thailand; while large firms employ 52 per cent in China, 53 per cent in Malaysia, 42 per cent in Thailand but only 10 per cent in India.

The existence of dual structures poses unique challenges. Some of the important characteristics of micro and small enterprises or those in informal sector include low access to technology, low labour productivity, limited access to finance and high vulnerability. This leads to higher disparity in labour productivity, wages and total factor productivity across manufacturing firms and across organised and unorganised manufacturing. Many have argued that existing labour regulations are largely responsible for firm size disparity in India. There are regulations which kick in after a threshold level in size is reached, for example firms employing more than 50-100 workers need to obtain state government permission to lay-off workers. Further, there are also regulations relating to work terms and conditions which are size-specific.

These dualisms with respect to 'formal' and 'informal' sector and 'missing-middle' along with limiting regulations pose unique challenges to the growth of manufacturing in India.

Key initiatives: The lacklustre growth of manufacturing sector in India has not been left unattended by the policymakers. In fact, many policies and plans have targeted growth in this sector, which include policies from high protection to modest liberalisation and rapid dismantling of protection along with reservations to a large number of manufacturing products for exclusive production for small scale industries.

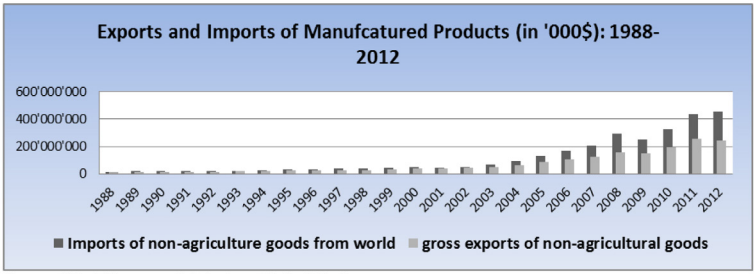
Some important policy initiatives to boost manufacturing growth were taken around mid-1980s; early 1990s and early 2000s. These include industrial de-licensing initiated in 1984-85; de-reservation of most of the items from small scale reservation in 1990s along with other reforms of 1990-91; steady tariff reductions and removal of quotas and restrictions on industrial products in 2000s; formulation of National Manufacturing Policy (NMP) in 2011; initiating Delhi Mumbai industrial corridor (DMIC) project; rapid policy reforms to promote foreign direct investment (FDI) and efforts to promote ease of doing business with projects like e-Biz.[4]

[4] See Economic Survey 2013 for details of these polices.

While there has always been a raging debate on the success of various reforms and policies, especially with respect to their impact on total factor productivity growth in manufacturing, the fact remains that the manufacturing sector has not been able to make any important contribution to the growth of the economy and has not been able to increase its share in GDP and total employment. In spite of India's rapid growth which has been accompanied by growth of per capita incomes, rise in domestic demand has not provided the much needed opportunity to increase industrial capacities and the sector is hollowing-out.

Rising competition in domestic and international markets: One of the probable reasons for this hollowing-out can be the intense competition that the sector is facing both in the domestic as well as external markets. Imports of manufactured products have increased much faster than their exports, especially post 2000. This has been the period of rapid growth of Indian economy with growing per capita incomes. Figure 2 depicts exports and imports of manufactured products (non-agricultural products) in India since 1988. Manufacturing sector seems to have 'missed the bus' and domestic demand has been increasingly catered by cheaper manufactured imports.Imports may have risen largely due to rapid increase in trade liberalisation and dismantling of protection to the sector during this period.

Figure 2: Exports and Imports of Manufacturing Products



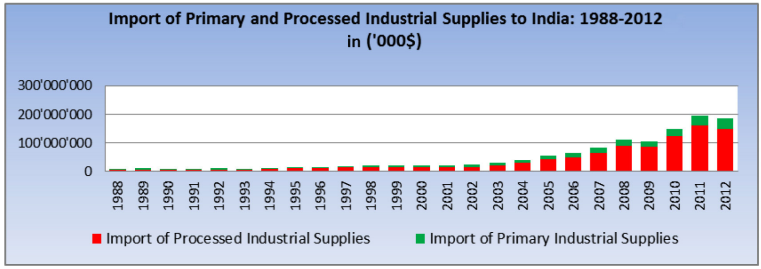
Source: World Integrated Solutions, United Nations

Chinese manufactured products seem to be more cost competitive as compared to Indian manufactured products. The share of China in India's imports of manufactured products rose steadily from 0.3 per cent in 1988 to 2.7 per cent in 2000 and then rose to 10.7 per cent in 2012, i.e., a rise of 588 per cent from the year 2000. The share of China in India's imports of consumer goods rose from 5.9 per cent in 2000 to 23.7 per cent in 2012. The evidence of surge in imports from China has been provided by DIPP (2012) which states: The indices of industrial production (IIP) for 268 items; import from all countries in these items (import index) and export index of these items have grown by 107.8 per cent, 1773.1 per cent, and 143.4 per cent respectively in 2010-11 over the

base of 2004-05, while Chinese index (imports from China) for same items has grown by 4618.4 per cent in 2010-11.

Not only finished manufactured products but gross imports of industrial supplies, both of primary as well as processed, also rose substantially in post 2002 period.The share of processed industrial supplies has increased much more rapidly than primary supplies. In 2012, processed industrial supplies comprised 80 per cent of total imports of industrial supplies. Figure 3 shows the rise in imports of industrial supplies and share of processed inputs over the period 1988-2012.

Figure 3: Import of Primary and Processed Industrial Supplies to India



Source: World Integrated Solutions, United Nations

International trade therefore seems to have provided tough competition to Indian manufacturing products both in the domestic market, especially from China, as well as in the external markets. Imports of both finished products as well as processed manufactured inputs have grown substantially. Exports have risen but at a much slower pace.

Increased imports of industrial supplies have led to increase in import-content of India's manufacturing exports, which increased rapidly from 10 per cent in 1995 to 25 per cent in 2009. Rising import-content in exports is many times celebrated and taken to be indicative of the extent to which an industry is linked to global value chains. However, to what extent this linkage is 'gainful' for the economy is often unassessed.

What is the Role played by Global Value Chains in 'Hollowing-Out'?

The emergence of global value chains (GVCs) has further complicated the 'trade-development debate' and has made it more difficult for developing countries to assess their gains from trade. GVCs emerged due to fragmentation of production processes across countries and continents and in the process have led to a faster rise in trade in intermediate products as compared to finished products. Higher exports can no longer be linked to higher production as imports of intermediate products which are used in exports also increase.

Nevertheless, 'linking to GVCs' has become the new development challenge for

policymakers. But linking to GVCs per se may not bring automatic gains. In fact, linking at lower end in GVCs by exporting raw materials has 'locked-in' many commodity exporting countries at the bottom and they continue exporting low-end and low-value added inputs with lower gains in terms of domestic value addition.[5] Some low income countries are 'locked-out' of GVCs, while many middle income countries are finding their trade figures rising with little rise in their domestic value-added growth. Further, studies have traced a 'smiley-curve' in GVCs which shows that the value captured by services in GVCs is much higher than that by manufacturing activities.[6] Countries contributing services like R&D, designing, branding, marketing, etc. are able to capture a much higher value in GVCs as compared to countries which provide inputs and manufacture the products.

To what extent are Indian manufacturing industries linked into GVCs and have gained is debatable as it depends on how 'gains' are estimated. To estimate a country's domestic value-added in exports, a new database has been released in 2013 by OECD-WTO, i.e., trade in value-added database (TiVA). This database covers 58 countries (including all OECD countries; BRICS countries; NICs1; NICs2, Cambodia, Brunei, Darussalam and 'rest of the world') and provides value added and trade data for five years- 1995, 2000, 2005, 2008 and 2009. Using harmonized input-output tables of these countries, the database provides domestic value-added that is exported and imported by a country. Although, the database has made it easier to analyze gains from trade with respect to domestic value-added generated by linking into GVCs, there is now a debate on the way to measure 'participation in GVCs'.

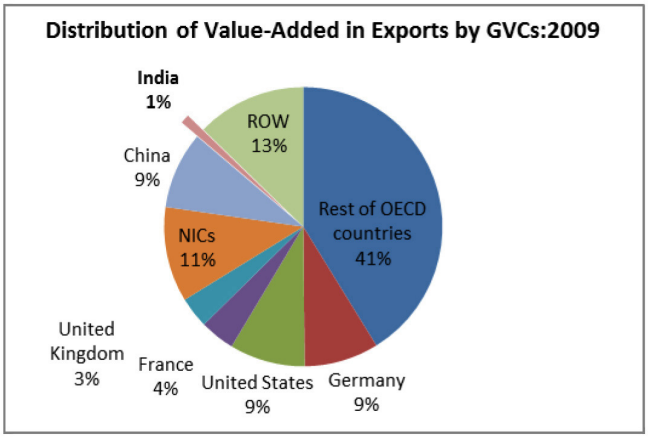
For a particular country, especially a developing country, linking into GVCs could either be through forward linkages (where the country provides inputs into exports of other countries) or through backward linkages (where the country imports intermediate products to be used in its exports). Using this sequential production process definition of participation in GVCs, the share of a country in total value-added created by trade in GVCs is estimated (Banga 2013).

Figure 4 shows the distribution of global value-added created by trade in GVCs in 2009. The share of OECD countries in total value-added created by trade in GVCs is found to be 67 per cent. Between countries, maximum participation in GVCs is of China (9 per cent), Germany (9 per cent) and US (9 per cent). All other developing countries together share less than 10 per cent of global value-added created by GVC participation. India's share in global value-added created by trade in GVCs is estimated to be around 1 per cent in 2009.

[5] See Gereffi (1994), Kaplinsky (2005) and Milberg and Winkler (2013)

[6] Gereffi and Korzeniewicz's (1994)

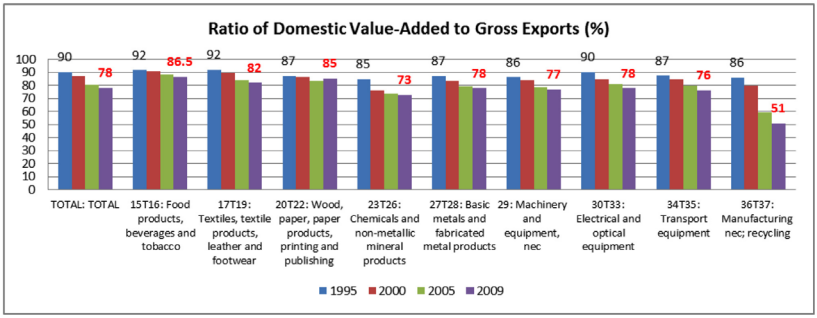
Figure 4: Share in Global Value-Added by Exports in GVCs



Source: Author's estimates from OECD Stat and OECD-WTO TIVA, 2013

Although, the share of India in global value-added created by GVCs is only 1 per cent, domestic value- added in exports of total manufacturing sector has experienced a steady decline from 90 per cent in 1995 to 80 per cent in 2005 and further to 78 per cent in 2009. This decline has been across the board in many manufacturing industries. Although almost all the industries experienced a rise in their exports in the period 1995-2009, there was a simultaneous decline in their value-added in exports. Traditional export-oriented industries like textiles and garments have also experienced a decline in domestic value-added in exports, which can have large adverse implications for the economy as these industries are not only labour intensive industries but employ mainly low-skill labour and largely women.

Figure 5: Domestic Value-Added as a Ratio of Gross Exports in Indian Industries: 10995-2009



Source: Author's estimates from OECD Stat and OECD-WTO TIVA, 2013.

The above analyses with respect to domestic value-added in exports as well as India's share in global value chains clearly points out that Indian manufacturing is not 'gainfully' linked to GVCs and is losing out on its value-added growth.

Is There a Way Out?

The declining share of the Indian manufacturing sector in GDP and total exports, declining employment elasticities, and rising imports provide sufficient evidence of hollowing-out of the Indian manufacturing sector. International trade seems to have played a key role in this process. This is posing daunting challenges for the policymakers. Many policies and initiatives have been taken to boost growth of output in the sector. However, these policies have fallen short of targeting declining domestic value-addition in manufacturing industries.

To increase value-added growth in manufacturing, it is necessary to strengthen backward and forward linkages of manufacturing industries between themselves as well as across sectors, including services sectors. Formalisation needs to be encouraged and existing dualist structures broken. While services sectors can substantially add to productivity growth of manufacturing, manufacturing can also add to growth of services by providing additional domestic demand for them. Thus, building strong domestic value chains within the economy is needed to be able to 'gainfully' link into global value chains. Incentivizing domestic firms to procure domestically in order to develop their domestic input industry can boost global competitiveness of many manufacturing industries.

In the race to link into GVCs, many industries are being opened to foreign direct investments (FDI) and import liberalisation is being pursued greedily. Opening up of retail sector can also be seen as an attempt to link into GVCs of foreign firms, who are expected to procure from domestic farmers and producers. However, a cautious approach is needed. China which is an epicenter of Asia for GVCs and has high participation in GVCs is now rethinking its policies and making efforts to increase its domestic value-addition. FDI should be used for catalyzing domestic investments, especially in manufacturing sector and for building industries which provide processed inputs to manufacturing.

How long can this hollowing-out continue? This issue needs urgent attention of the policymakers and India's industrial policy needs to be revamped not only to maximize the 'gains' from international trade and GVCs but also to face the dangers of not linking gainfully into GVCs.

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Exports of Environmental Goods and Services (EGS)

Exploiting the Global Demand

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There is a huge potential in India for exporting environmentally friendly goods that will attract a tariff. India needs to make appropriate policy changes to enable it to take advantage of this huge and growing market. An exploration of the data and a measurement of the gap between potential exports and actual exports in these environmentally friendly goods market, using a model developed by the authors, throw up evidence that Indian governance constraints have had a huge negative effect on the exports of environmentally friendly goods.

What are environmental goods and services? A clear definition of EG is important because it will set clear parameter on the types of goods that are actually liberalised. There are different approaches to identifying goods that have been proposed by WTO over the past few years for multilateral liberalisation of trade in EG. The first suggestion is a list of environment-friendly products as proposed by the Friend of Environmental Goods group including Canada, EU, Japan, Republic of Korea, New Zealand, Norway, Switzerland, Taiwan and the US. The list has a wide coverage containing 153 goods with the aim of securing a zero tariff for these products by 2013. In addition, India has advocated the 'environmental project approach', where each WTO member designates a national authority to select environmental projects based on criteria developed by the Special Session of the Committee on Trade and Environment. Following the framework of the WTO, EG can be classified by 12 groups namely, air pollution control, management of solid and hazardous waste and recycling systems, clean up or remediation of soil and water, renewable energy plant, heat and energy management, waste water management and potable water treatment, environmentally preferable products based on end use or disposal characteristics, cleaner or more resource efficient technologies and products, natural risk management, natural resources protection, noise and vibration abatement, and environmental monitoring, analysis and assessment equipment (Monkelbann 2011).

Table 1: India's Exports of EG to the World (US$ '000)

Product description	2005	2006	2007	2008	2009	2010
Air pollution control	214,623	437,949	540,241	724,312	626,656	1,033,679
	23	49	41	12	56	79
Management of solid and hazardous waste and recycling systems	423,145	466,624	604,740	681,157	587,238	546,804
	45	24	40	57	38	4
Clean up or remediation of soil and water	17,514	25,529	64,292	4,099	90,333	69,379
	4	9	2	9	3	
Renewable energy plant	608,770	1,172,015	1,551,932	2,627,162	2,071,148	2,210,387
	2	8	0	67	95	3
Heat and energy management	37,862	41,158	72,490	101,267	207,895	195,493
	2	8	0	67	95	3
Waste water management and potable water treatment	810,145	1,045,467	1,333,873	1,855,767	1,542,465	1,746,190
	45	467	873	767	465	90
Environmentally preferable products, based on end use or disposal characteristics	73,641	75,547	71,444	93,548	63,886	116,729
	1	7	4	8	6	9
Cleaner or more resource efficient technologies and products	13,520	9,075	7,826	3,001	18,564	36,918
	0			1	4	
Natural risk management	17,508	31,711	34,224	41,729	82,670	30,817
	8	1	4	9	0	
Natural resources protection	18,403	20,553	10,424	14,378	21,906	29,685
	3	3	4	8	6	
Noise and vibration abatement	368,355	472,822	562,707	658,961	469,918	624,469
	55	22	07	61	18	9
Environmental monitoring, analysis and assessment equipment	99,006	102,801	156,070	233,237	295,494	330,205
	6	01	70	37	94	5

India's exports of EG: Although the sector that produces EGS was virtually non-existent in India two decades ago, India has become a major exporter of these goods and a promising market for them. The domestic environmental industry is still highly disorganised and is dominated by small scale units (Katti 2005).

The contribution of EG exports has been increasingly important for India. Table 1 shows the export values of EG by groups over time. According to the recent data of India's exports of EG, the Asia-Pacific countries are the important markets for EGS from India and the value of India's EG exports to these markets has been increasing overtime. The US is a major importing partner, accounting for most of India's EG. For example, about 20 per cent of the EG consisting of renewable energy plant group was exported to the

US market in 2010. The values of goods in the groups of waste water management and potable water treatment and noise and vibration abatement sold in the US were around $ 300 million and $ 180 million, respectively. In addition, China, Thailand, Malaysia and Australia are also dominant importers of India's EG in the groups of clean up or remediation of soil and water (China $10 million, Malaysia $8 million), management of solid and hazardous waste and recycling systems (Thailand – $ 34 million) and heat and energy management (Australia – $ 35 million).

Analysing the Data

***Methodology*:** Gravity model is a tool to examine the determinants of exports flows between countries. It was first applied by Tinbergen (1962), which is based on the principles that the export between two countries generally has positive relation with gross domestic product (GDP) but negative relationship with the geographic distance between countries. The conventional gravity model, which is described as a regression equation in logarithm having export as the left hand side variable and GDP and distance between trading countries as right hand side variables, has been criticized for its lack of theoretical underpinnings, and its issue with omitted variables bias due to the exclusion of 'trade resistances', such as 'behind the border' constraints or non-tariff barriers from the gravity model. To deal with these problems, researchers have suggested different methods of modelling and estimation of the gravity equation.

Kalirajan (2008) suggested a methodology to model and estimate the gravity model taking into account of 'behind the border constraints' drawing on the modelling and estimation procedures used in the stochastic frontier production function literature. The advantage of using the stochastic frontier gravity model is that it is possible to incorporate and measure the effects of 'behind the border' constraints on exports, when the researcher does not have full information about these constraints.

Now, export potential is defined as the maximum possible export that can be achieved in contrast to the average export estimated using the conventional gravity model analysis. Export potential tells us what export would be in a hypothetical case of frictionless and free trade regime. Therefore, the ratio of the actual exports to the potential exports is called the 'export efficiency'.

Drawing on Kalirajan (2008), the export growth can be decomposed in terms of different components of the determinants of export growth, such as 'natural' determinants, 'behind the border' determinants, 'explicit beyond the border' determinants, and 'implicit beyond the border' determinants. Thus, the supply of EG (X) depends on many factors. First, it depends on the GDP and population of importing countries. The assumption is that higher income and population in the foreign countries would generally lead to increase in demand for EG from India. However, the relationship between distance and EG exports is negative due to the higher cost of transportation. These factors can be named as 'natural determinants' of export flows between countries.

Next, 'explicit beyond the border' determinants such as the relative price of the imported goods and services that are mainly influenced by importing countries' tariff and exchange rate are another factors affecting export performance. This factor is expected to have negative correlation with EG exports because increasing tariffs and the devaluation of the domestic currencies lead to higher imported prices in domestic market. Therefore, the demand for imports is reduced.

Different kinds of institutional and infrastructural rigidities that exist in the exporting countries, such as poor port facilities may influence exports negatively and these factors may be referred to as 'behind the border' determinants in the home country, which are under the control of the exporting countries. Unfortunately, it is difficult for the researchers to quantify all the 'behind the border determinants' individually. Nevertheless, the combined effects of all these determinants can be modelled as a random variable with a truncated normal distribution.

Also, different kinds of institutional and infrastructural rigidities that exist in the importing countries also would influence export flows negatively, and these factors may be called as 'implicit beyond the border' determinants, which are beyond the control of the exporting countries. It is modelled as a random variable with a full normal distribution.

Free trade agreements (FTA) that are in the forms of improvement in trade promotion and facilitation policies of both India and its trading partners are expected to positively influence EG exports of India. A dummy variable (TA) can be used to represent whether there are such trade agreements and the influence of these factors on exports may be named as 'mutually induced determinants'.

The methodology for decomposing the changes in exports between two time periods, say between 2005 (period 1) and 2010 (period 2) is explained as follows: (i) the difference between actual exports in period 2 and period 1 is calculated and let it be called DX; (ii) the potential export frontier of home country (India) in period 1, which gives the potential exports in period 1, is estimated using the export data and the software called FRONTIER 4.1 and the export efficiency is calculated as EF1; (iii) the potential export frontier of home country (India) in period 2, which gives the potential exports in period 2, is estimated using the export data and the software called FRONTIER 4.1 and the export efficiency is calculated as EF2; (iv) the difference between export efficiency in period 1 and period 2 resulting from changes in 'behind the border' constraints in home country is calculated and it is named as EF; (v) the difference between the potential frontier in period 1 and the potential frontier in period 2 evaluated at the same levels of determinants of exports in period 1 is calculated as the impact due to the change in 'implicit beyond the border constraints' and it is named as TP; (vi) now, adding TP with EF and then subtracting the sum from DX gives the impact of changes in 'natural determinants' and the 'explicit beyond the border' constraints, which include tariffs and exchange rates.

Thus, the changes in exports between two periods may result from the reduction in 'behind the border' constraints over time through home country domestic reforms; reduction in both 'explicit and implicit beyond the border' constraints in partner countries due to partner countries' reforms and mutual discussions; increase in export demand in partner countries due to increase in partner countries' income levels and population, and, implementation of trade agreements between home and partner countries.

Nature of Data: EG used in this study are the WTO 153 lists, which are divided into 12 groups. The data of exports of EGS from India is collected from the official website of World Integrated Trade Solution (WITS) in the period between 2005 and 2010, while GDP, population and exchange rate are derived from the official website of World Bank (WB) and the data of distance is calculated between capital cities, between India and its partner countries through the website of Distance Calculator. Tariff data is extracted from WITS by HS 6-digits and then tariff is calculated by average tariff for 12 groups of EG. Trade agreements are collected from the website of the Ministry of Commerce and Industry of India.

Making Sense of the Evidence

Changes in India's EG exports is decomposed as discussed above for the 12 groups of EG for the selected 10 Asia-Pacific economies, which are the major trading partners of India for EG, for 2 periods 2005 and 2010. The results show that in most cases, the 'behind the border' constraints, which are under the control of India, have negative effects on India's EG exports, while the reduction of the 'implicit beyond the border' constraints, which are under the control of India's trading partners, have contributed strongly positively to the EG export growth. The former result indicates that India should take serious reform measures to eliminate its 'behind the border' constraints.

EGS can benefit the Indian economy in terms of not only increasing its national income, but also improving environmental conditions at the national level. A stochastic frontier gravity model has been used here to examine whether India has achieved its EG export potential with its top ten export markets of the Asia-Pacific economies, using the WTO 153 list classified into 12 groups for the two periods 2005 and 2010..

The results show that the institutional and infrastructure rigidities of India, which are the main causes for the emergence of the 'behind the border' constraints, exert dominant negative effects on its exports of EG. But the negative effects were not significantly large for the EG exports group of renewable energy plant. The reduction in India's trading partners' 'implicit beyond the border' constraints has made significant contribution to India's exports of EG, especially in recent years between 2005 and 2010. The export growth changes due to 'explicit beyond the border' constraints are relatively small. These results show that India should eliminate its 'behind the border' constraints.

To promote exports of EG, India needs to improve its infrastructure and institutional framework, that are central to India's exports. We were unable to identify specific

'behind the border' constraints due to lack of uniform data; but some evidence-based conjectures can be made. For example, India can improve the performances of its exporting firms by widely disseminating information on importing countries' laws related to EG. Also, port facilities can be improved for efficient functioning and bureaucratic delays in dispatching EG need to be eliminated. At a broader level, India should evolve trade agreements and multilateral/bilateral negotiations effectively to reduce the negative impact of its trading partner countries' 'implicit beyond the border' constraints on India's EG exports.

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Wages and Labour Productivity in Indian Manufacturing

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The manufacturing labour market in India is far from being a space that allows free matching of employers' and labour's expectation. Indian manufacturing work systems continue to be highly homogenous, defying the emerging human resource management paradigms that are built around employee engagement, sustainable performance, gender diversity, career growth and trust. While there is a direct relationship between wage rate and productivity, the conversion of productivity to wage is interrupted by many factors importantly, archaic labour laws and ineffective enforcement systems that need widespread reform.

The micro economic theory of labour market posits that in the short run, assuming factor and product markets perfectly competitive, profit maximising firm goes on employing labour until the real wage rate equals the value of marginal product of the labour (Lal, 1979 provides a lucid explanation of the micro economic theory of wage). Quite important, in the short run, capital tends to remain fixed, making the output being sensitive only to the labour. However, the rationality that is applicable to the short run is unlikely to emerge as a profit maximising scenario when both the capital and labour change in the long run. Drawing cues from micro economic theory of production in the long run, the profit maximising employment of labour leads to wage is being determined by capital labour ratio (Appendix 1). While these models capture firms' decision making to determine employment and wage, known as the demand side of the labour market, variations in wage also emanate from household-personal characteristics of labour, called the supply side of the labour market. As illustrated by the economic theory, wage may be specified as function of age, years of schooling, and socio-demographic characteristics, culminating in direct relation between wage and years of schooling (Schultz, 1961). Juxtaposing both the demand and the supply, direct relation of wage with productivity, capital-labour ratio, and educational attainment presumably lead to an inference that points to why technological changes, implicit in increasing capital labour ratio over time, require workers with higher educational attainment who are to be paid higher for their higher productivity levels.

We, drawing cues from basic micro economic theory of labour market, explore determinants of wages in Indian manufacturing, covering both the demand and the supply side.[1]

Wage Productivity Relation

There exists a direct relationship between the two variables which is linked to value addition by a firm and the substitution process between labour and capital. Using data from Annual Survey of Industries (ASI), we infer that there's a negative relation between employment and adoption of technology. Across industries, however, real wages have remained static over time pointing the need of policy intervention. This linkage of low real wages and productivity growth in the organized manufacturing sector has led to the enormous growth of the informal sector which is more flexible. As observed from the survey period, wage productivity relations involves both product and process innovation. The relation between productivity and wages has been explored using standard microeconomic theory of wage determination. We use real wages, defined as nominal emolument per employee[2] divided by Consumer Price Index (CPI) deflator while we use average productivity, derived by dividing value of output by manufacturing price deflators per employee to measure productivity; both have been valued at 2001-02 prices. We form the database by pooling the data of 57 industries, as classified by National Industrial Classification (NIC) 2004, during 1993-1994 to 2007-2008. This forms a panel of 845 data units.[3] Figure 1 portrays the relation between wage rate and productivity after aggregating 57 industries into 22 industrial groups, following the NIC 2 digit classification. Overall, the pattern indicates a direct relation. Disaggregating the pattern, as shown in appendix 2, we observe direct relation between real wage and productivity, notwithstanding a few vague patterns between these two variables. As given in Table 1, different papers that were published during 1960-2013 corroborate the positive relation between wage rate and productivity in Indian manufacturing.

[1] While the demand side is captured by using a panel database (A database becomes a panel when there are multiple units of time and multiple cases.) of manufacturing industries, disaggregated for National Industrial Classification (NIC) 3 digit during 1993-1994-2007-08, supply side is elucidated by plotting patterns drawn from National Sample Survey 66th Round unit records.

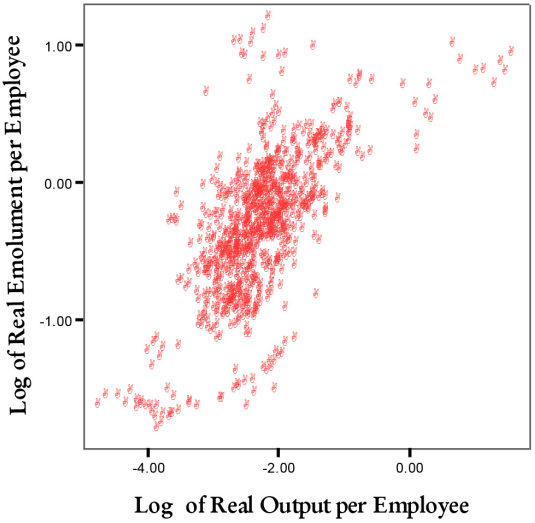
[2] According to Annual Survey Industries (ASI), employees include work men and managerial and supervisory staff. As shown in Appendix 3, across industries percentage of workmen out of employees hovers in the range of 60 to 80, barring a few exceptions.

[3] Although the panel ought to have 57 industries and 15 units of time, sizing 855 data units, due to missing observations the panel is delimited by 845 units.

Table 1: Select Papers on Wage-Productivity Relation in Indian Manufacturing

Hajra (1963)	Positive Relation between wage rate and productivity (Time series data: 1952-1958)
Johri and Agarwal (1966)	Positive Relation between wage rate and productivity (Time series data: 1950-1961)
Dadi (1970)	Positive Relation between wage rate and productivity (1962 cross sectional data)
Verma (1972)	Positive Relation between wage rate and productivity (Time series data: 1950-1964)
Sen (1985)	Positive Relation between rate of change in wage rate and rate of change in productivity (Time series data: 1960-1976)
Banga (2005)	Positive Relation between wage rate and productivity (Panel data: 1991-92-1997-98)
Muralidharan et al (2013)	Positive Relation between wage rate and productivity (Panel data: 1993-04-2007-08)

Figure 1: Real Wage and Average Employee Productivity during 1993-04-2007-08



Source: Pooled Data across industries and years extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

However, across industries, as depicted in Appendix 4, real wage rate appears to be more static during 1993-94-2007-08.[4] Muralidharan et al (2013), point to the yawning

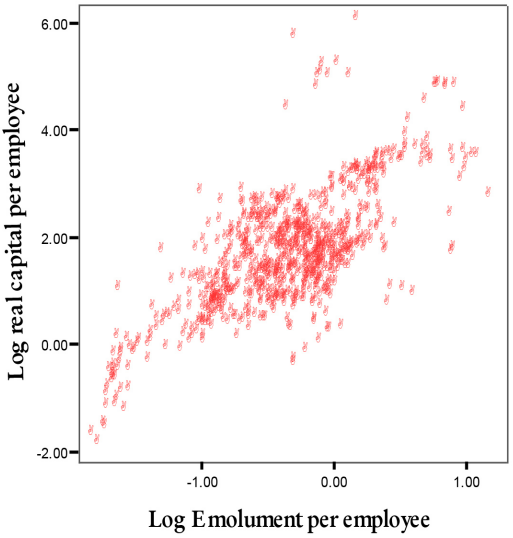
[4] Trivedi et al (2011) share concern on stagnation of real wage rates for manufacturing workers.

gap between nominal and real wage rates, arguing for more pro active wage policies that link the wage rate not just with the productivity but also with the cost of living.

As discussed in the introduction, in a scenario wherein both factor and product markets are competitive, as both capital and labour vary, causing a range of same output resulting from substitution process, wage tends to be sensitive to capital labour ratio. As depicted by Figure 2 and Appendix 5, in Indian organised manufacturing, wage rate appearsto directly vary with capital labour ratio.[5] Interestingly, Daugherty et al (2009), using Annual Survey of India (ASI) factory data for 1993-94 and 2002-03, show the direct relation between value added per labour and capital labour ratio.

Further, they show that value added per labour directly varies with employment size of manufacturing unit. Quite important, this relation is also valid for unorganised manufacturing (NSSO, 2013).[6] Combining these findings, it may be argued that the direct relation between wage and capital labour ratio seems to be linked with direct relation between productivity and labour saving technologies. Further, as shown by Figure 3, there appears to be a negative relation between employment and capital labour ratio, affirming the direct linkage between labour saving technologies and wage rate. Except a few not so clear patterns, we get inverse relation between employment and capital labour ratio at disaggregated level as well (Appendix 5).

Figure 2: Capital Labour Ratio and Wage Rate during 1993-04-2007-08

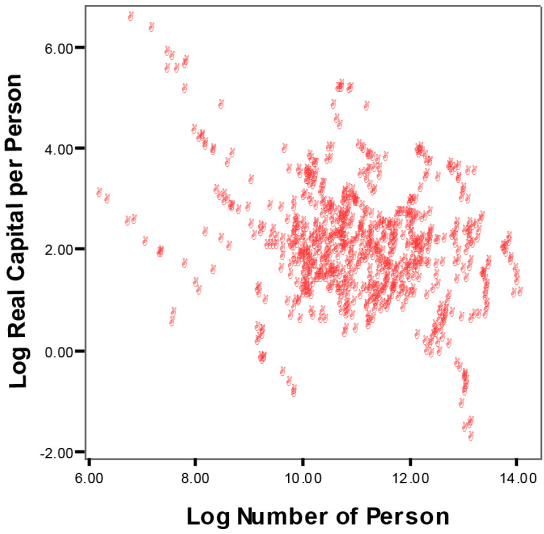


Source: Pooled Data across industries and years extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

[5] We constructed capital labour ratio by dividing real capital by persons. To derive capital, we used perpetual inventory method that was discounted by capital goods deflator.

[6] According to NSSO (2013), while enterprises employing less than 4 workers report average gross value added per labour of Rs 11634, values in respect of enterprises employing 4-7 and 8 or more workers are Rs 21872 and Rs 55994.

Figure 3: Capital Labour Ratio and Labour during 1993-04-2007-08



Source: Pooled Data across industries and years extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

Drawing cues from above patterns, wages have a direct but weak relationship with productivity in the short run in organised manufacturing. Moreover, wage rate appears to be weakly influenced by capital labour ratio (see Appendix 6). These findings indicate how persistent the wage-productivity relation is. While a school of scholars sees this situation emanating from lack flexibility in labour market due to archaic labour laws, the opposing school views that Indian labour market as hugely flexible that manifests itself in the enormity of informal sector in India (Bino, 2013). It can be inferred that wage-productivity relations are driven by both product and process innovation if we view industrial relations more than as a source for keeping nominal wages low.

Determinants of Wage

The human capital theory of labour supply expresses wage as a function of age, and years of schooling. Extending this function, we relate wage with educational attainment, technical qualification, vocational training, social category, gender, area of residence, type of employment, and occupation. As shown in Table 2, close to a half of employed have attained not more than seven years of schooling while 90 per cent of them do not have any technical qualification. Moreover, only 7 per cent have attained formal vocational training. Socially disadvantaged social groups - scheduled tribe, scheduled

caste and other backward class - form 57 per cent of employment, while women are just one-tenth of workforce. Only 27 per cent of the workforce stays in rural areas. Nearly two-thirds of the workforce is in informal employment that does not entitle employees to any social security. A whopping 90 per cent of workforce belongs to the occupational category 'workmen'. In summary, two features are to be highlighted: (a) the absorption of persons having technical qualification/vocational qualification or tertiary education in manufacturing industry appears to be quite limited that may pause critical challenges, in particular in the context of increasing capital labour ratio, and (b) manufacturing is yet to emerge as a gender inclusive work system.

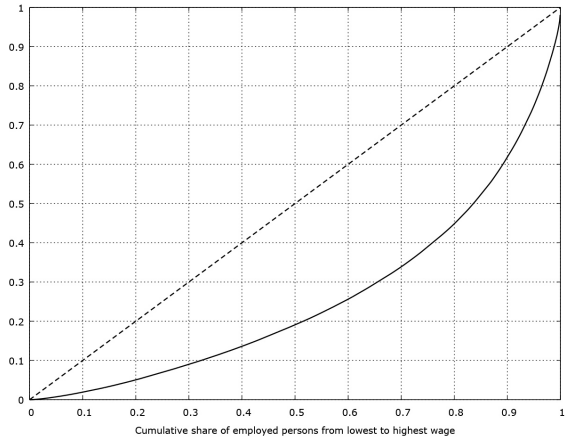
Table 2: Characteristics of Workforce in Indian Manufacturing 2009-10

Educational Attainment	**Percent**	**Social Group**	**Percent**
Not Literate	8.4	Scheduled Tribe	2.4
Just Literate	6.2	Scheduled Caste	16.2
Primary	14.7	Other Backward class	38.6
Middle	20.0	Others	42.8
Secondary	19.3	Total	100.0
Higher Secondary/Diploma	15.6	**Gender**	**Percent**
Graduate	12.4	Male	90.4
Post Graduate	3.4	Female	9.6
Total	100.0	Total	100.0
Technical Qualification	**Percent**	**Area**	**Percent**
Graduate	1.8	Rural	27.3
Diploma	6.3	Urban	72..7
PG Diploma	1.7	Total	100.0
No Technical Qualification	90.2	**Type of Employment**	**Valid Percent**
Total	100.0	Informal	66.7
Vocational Training	**Percent**	Formal	33.3
Formal Vocational Training	7.4	Total	100.0
Informal Vocational Training	18.8	**Occupation**	**Valid Percent**
No Vocational Training	73.8	Workmen	89.1
Total	100.0	Managerial Staff	10.9
		Total	100.0

Source: Computed from National Sample Survey 66th Round Unit Records

Figure 4 depicts Lorenz curve of wage distribution in Indian manufacturing that combines both managerial and workmen categories. While lowest 20 per cent gets just 5 per cent of wages, lowest 40 per cent, 60 per cent and 80 per cent get 13 per cent 25 per cent and 45 per cent of cumulative wage, respectively.

Figure 4: Lorenz Curve of Weekly Wage in Indian Manufacturing (Male + Female; age 15-64), (Usual Principal Status), 2009-10



Vertical Axis (Cumulative share of wages) and Horizontal Axis (Cumulative share of employed persons from lowest to highest wage (N=5454)
Source: Computed from National Sample Survey (NSS) 66th Round Unit Records

As shown in Figure 4, the departure of cumulative wage from the 45 degree line of absolute equality evokes questions concerning the sources of wage differential in the labour market. To assess the wage differential, we cross tabulate wages with respect to variables listed in Table 2. We compute median wage for each category since we found that arithmetic mean of wage was sensitive to the outliers.[7] The median weekly wage tends to go up with educational attainment.

While the post graduate earns the highest weekly median wage i.e. Rs 3670, median weekly wages for graduates and holders of higher secondary/diploma certificates are Rs 2800 and Rs 1500, respectively. This is quite consistent with the human capital theory.[8] Further, graduates in technical disciplines earn Rupees 5000, significantly higher than the apex earning by post graduates in the general education stream. However, compared to post graduates and technical graduates, persons who have attained formal vocational training earn much lesser wage i.e. Rs. 2000. Presumably, this differential emanates

[7] Either too large or too small values that impact the mean.

[8] Human capital theory posits positive relation between earning and years of schooling.

from occupational differences since persons having tertiary education are more likely to be absorbed in better paid managerial/supervisory roles than persons with vocational training. It appears persons with formal vocational training earn more than persons who do not have formal vocational training. Characteristics that lead to higher wage include person being of forward caste, male, located in urban areas, employed as formal workers, and belonging to managerial and supervisory occupations (see Appendix 7 for multivariate analysis of wage function).

Table 3: Characteristics of Workforce and Median Weekly Wages (Indian Rupees) in Indian Manufacturing 2009-10 (Age group 15-64)

Educational Attainment	Median Weekly Wage	Social Categories	Median Weekly Wage
Not Literate	700.00	Scheduled Tribe	1,006.00
Just Literate	750.00	Scheduled Caste	802.50
Primary	800.00	Other Backward class	1,000.00
Middle	900.00	Others	1,400.00
Secondary	1,055.00	Total	1,050.00
Higher Secondary/Diploma	1,500.00	Gender	Median Weekly Wage
Graduate	2,800.00	Male	1,100.00
Post Graduate	3,670.00	Female	666.00
Technical education	Median Weekly Wage	Total	1,050.00
Graduate	5,000.00	Area	Median Weekly Wage
Diploma	2,500.00	Rural	881.00
Post Graduate Diploma	3,896.00	Urban	1,169.00
No Technical Education	1,000.00	Total	1,050.00
Total	1,050.00	Type of employment	Median Weekly Wage
Vocational Education	Median Weekly Wage	Informal	840.00
Formal	2,000.00	Formal	2,000.00
Informal	1,000.00	Total	1,050.00
No Vocational Training	1,025.00	Occupation	Median Weekly Wage
Total	1,050.00	Workmen	1,000.00
		Managerial and Supervisory	3,000.00
		Total	1,050.00

Source: Computed from National Sample Survey 66th Round Unit Records

Combining perceptible advantages that generate wage premium in manufacturing, we pick type of employment as a representative case to see if the differential varies across

industries. Quite important, type of employment, a nominal variable that is made of formal and informal employment, is in fact a combination of multiple scenarios. For example, a person who is, in formal employment that generates higher wage and social security, is likely to have attained more educational attainment and has higher chances to be in managerial and supervisory category, and so on, while informal employment represents the opposite case. As shown in Table 6, premium earned by formal work over informal work varies between 99 per cent and 549 per cent. As shown by Muralidharan et al (2013), the wage structure in manufacturing is characterised by visible gap in trend growth rates of wage rate between managerial and supervisory occupation and workmen; the median ratio of growth rates in respects of former and latter is 2.5. Perhaps, this wage structure that is embedded in perceptible differentials may have its roots in lack of occupational mobility at the shop floor and inadequate on-the-job training to enhance human capital formation. Further, they point to the insensitivity of minimum wages to skill acquisition in India, showing abysmal wage premium for the skill being offered by minimum wage legislation.

Table 4: Type of Employment and Median Weekly Wages (Indian Rupees) in Indian Manufacturing 2009-10 (Age group 15-64)

Industry (National Industrial Classification 2004 2 Digit)	Informal	Formal	Premium earned by formal over informal$
manufacture of food products and beverages	750	1,500	200
manufacture of tobacco products	750	875	117
manufacture of textiles	825	1,072	130
manufacture of wearing apparel; dressing and dyeing of fur	800	1,300	163
tanning and dressing of leather; manufacture of luggage	840	1,125	134
manufacture of wood and of products of wood and cork	800	2,000	250
manufacture of paper and paper products	900	2,000	222
publishing, printing and reproduction of recorded media	902	2,071	230
manufacture of coke, refined petroleum products and nuclear fuel	875	4,800	549
manufacture of chemicals and chemical products	1,000	2,375	238
manufacture of rubber and plastic products	875	1,700	194
manufacture of other non-metallic mineral products	750	1,550	207
manufacture of basic metals	785	3,400	433
manufacture of fabricated metal products, except machinery and equipments	875	1,800	206
manufacture of machinery and equipment	945	2,500	265
manufacture of office, accounting and computing machinery	1,025	4,000	390
manufacture of electrical machinery and apparatus	1,050	3,015	287
manufacture of radio, television and communication equipment and apparatus	850	2,500	294
manufacture of medical, precision and optical instruments, watches and clocks	1,550	1,530	99
manufacture of motor vehicles, trailers and semi-trailers	1,050	2,470	235
manufacture of other transport equipment	893	3,750	420
manufacture of furniture; manufacturing	1,000	1,338	134
Recycling	1,125	2,100	187

$ Premium = ((Formal sector wage /Informal sector wage)-1)*100
Source: Computed from National Sample Survey 66th Round Unit Records.

The above statistical exercise clearly points to interesting dimensions of the supply side of wage, in particular the apparent skill gaps. Perhaps, there ought to have creative labour market policies that induce creation of more skilled pool of human resources having appropriate technical, vocational and behavioural skill sets.

Conclusive Remarks

While it is almost a stylised fact that there exists direct relation between wage rate and productivity in Indian manufacturing, it is important to argue that there ought to have been stronger relation between wage and productivity. Perhaps, the inertia that interrupts conversion of productivity to wage emanates from both institutions of labour market such as archaic labour law and ineffective enforcement systems, and firms' apathetic strategising of human capital formation in factories. Combing all these contexts, the manufacturing labour market is far from being a space that allows free matching of employers' and labour's expectation. Moreover, it is evident from data that Indian manufacturing work systems continue to be highly homogenous, defying the emerging human resource management paradigms that are built around employee engagement, sustainable performance, gender diversity, career growth and trust.

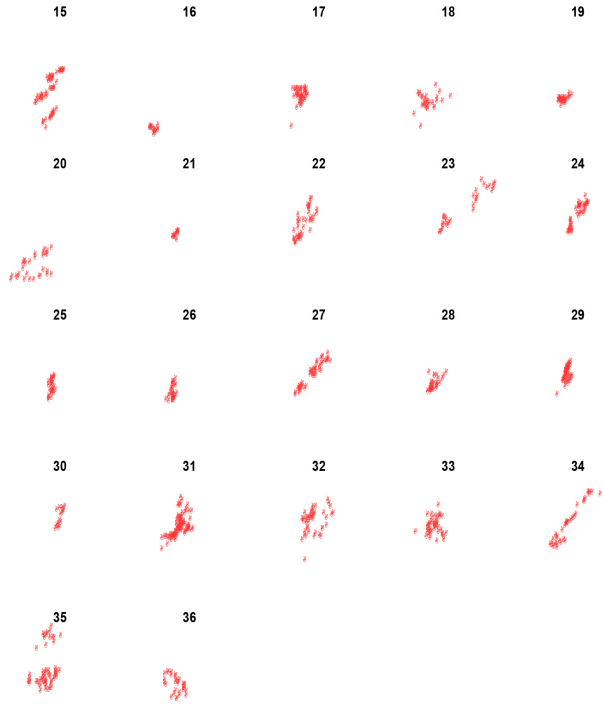
Appendix 1

In the short run, $\pi = pq-wl$. π = Profit, p = unit price, q = output, w = wage rate, l= labour. Specifying $q = f(l)$, q is expressed as l^a. So, $\pi = pl^a-wl$. Differentiating π with respect to l , $apl^{a-1} – w = 0$ and this implies $ap(q/l) = w$. Converting this equation to a statistical model with parameters, we get $w = \alpha + \beta\, q/l + u$. While α and β are parameters, u is a stochastic variable that captures the noise. However, in the long run both capital (k) and (l) do vary. Then, $\pi=pq-(wl+rk)$. r and k are compensation to capital and capital, respectively. Q is a function of k and l; $q = f(k,l)$. This function may be expressed as $k^a l^{1-a}$. So, $\pi = p\, k^a l^{1-a} – (wl + r\, k)$. Differentiating π with respect to k and l setting respective derivatives equal to zero, $r = ap\, q/k$ and $w = (1-a)\, p\, q/l$, and $w = (1-a)/a\, r\, k/l$. Transforming this into a statistical model, $w = \alpha + \beta\, k/l + u$ [9] .

[9] In both the short run and the long run scenarios, a priori $\beta > 0$.

Appendix 2

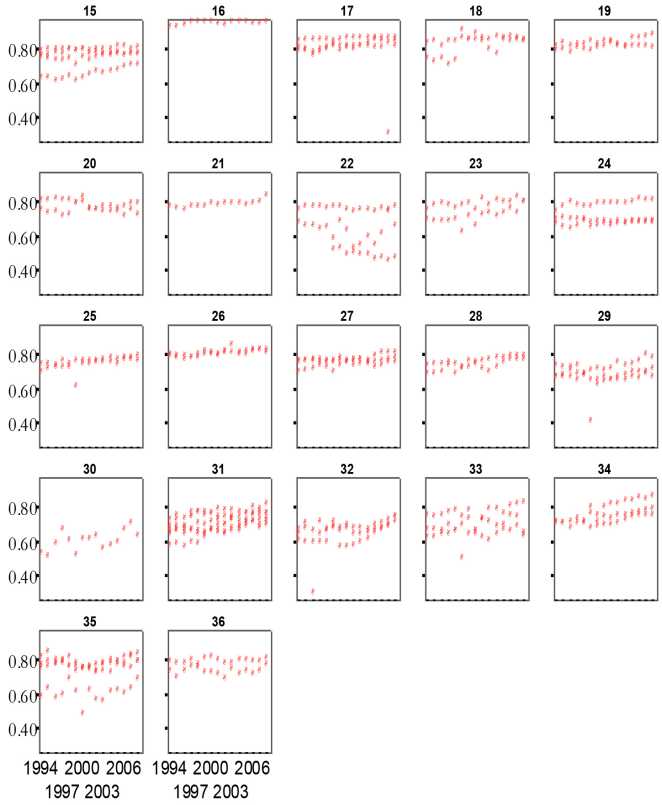
Wage productivity relation in Indian Manufacturing (NIC 2 Digit) during 1993-04 to 2007-08



Vertical axis: Logarithm of real emolument per per person, **Horizontal Axis**: Logarithm of real value of output per employee

Source: Data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

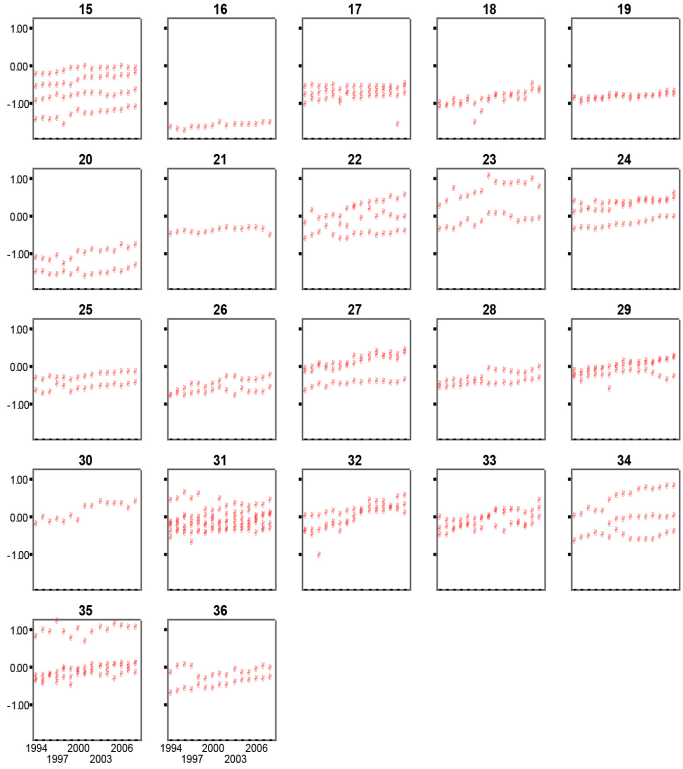
Appendix 3: Workers as a percentage of employees (NIC 2 Digit)
During 1993-04 to 2007-08



Vertical axis: Workers as a percentage of employees, **Horizontal Axis**: Year

Source: Data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

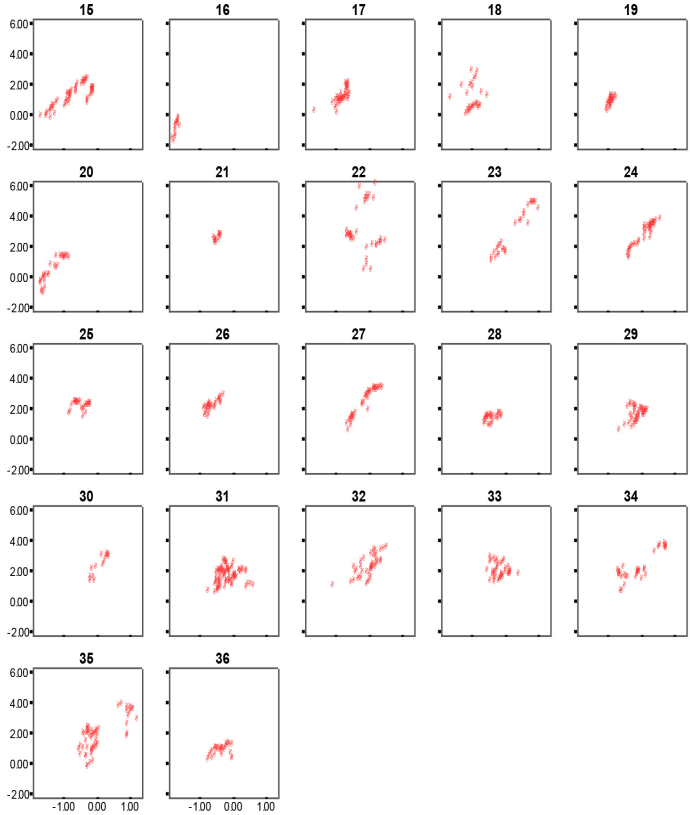
Appendix 4: Trend of Wage (NIC 2 Digit) during 1993-04 to 2007-08



Vertical axis: Log of Real Emolument per Employee, **Horizontal Axis**: Year

Source: Data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

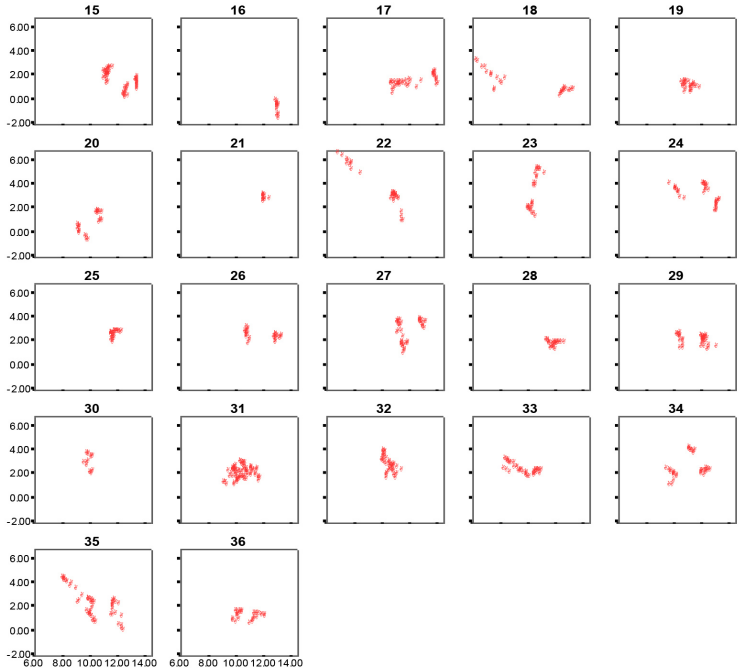
Appendix 5: Relationship between Capital Labour Ratio and Wage Rate (NIC 2 Digit) during 1993-04 to 2007-08



Vertical axis: Log of Real Capital per Employee, Horizontal Axis: Real Emolument per Employee

Source: Data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

Appendix 5: Relationship between Capital Labour Ratio and Labour (NIC 2 Digit) during 1993-04 to 2007-08



Vertical axis: Log of Real Capital per Employee, Horizontal Axis: Log of Number persons employed

Source: Data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation Compact Disc and ASI reports

Appendix 6: Regression Estimates

It is important to note that wage-productivity relation may be sensitive to the type of industry and the year. In view of variation that stems from the type of industry and the year, it is unsure if a regression that uses pooled data across industries and years, without absorbing heterogeneities such as type of industries and years, provides a valid estimate. There are two alternatives. First, an option is to absorb type of industries in regression, called fixed effect panel regression. Second option is to combine error with the constant, called random effect model. Before exploring these options, we ran four models. First, we pooled the whole data across years and type of industry, and ran a regression between real wage rate and productivity. In the second model, we regressed real wage rate on dummies for the type of industry and productivity. The third posits real wage rate as a function of productivity and dummies for years. The fourth model puts real wage rate is dependent on productivity and dummies for both the type of industry and the year. Assessing these four regressions, while coefficient of productivity and most of dummies for the type of industries were significant, most of coefficients in respect of time turned out to be insignificant. Statistically significant coefficients that represent the relation between real wage rate and average productivity for first, second, third and fourth models are 0.46, 0.27, 0.45 and 0.16, respectively. Instead of using real output put per person as average productivity, we may use real net value added[10] per workers in all the four models, coefficients are 0.35, 0.13, 0.52 and 0.10 respectively while dummies in respect of the type of industry and years exhibit almost same pattern that was shown by regressions involving real output per employee. Our panel model, whether fixed or random effect, is a bi-variate one, not having other explanatory variables. Between fixed and random effect specification, using Hausman test, we choose fixed effect model since the null hypothesis of difference in coefficients not systematic is rejected (Table 1). The magnitude of relation between real wage rate and productivity is captured by the coefficient that measures proportionate change in real value of output per worker divided by proportionate change in real wage per worker. The value of coefficient is 0.27 which is the elasticity of wage rate to productivity. The estimate points to a weak productivity-real wage relation in Indian manufacturing. However, when we substitute output by net value added, fixed effect does not turn out to be more appropriate than random effect while both generate same values of elasticity i.e. 0.13. Moreover, as depicted in Appendix 3, across industries, real wage rate appears to be discernibly less dynamic, rather more static during 1993-94-2007-08.

Table 1: Wage Productivity Relationship in Indian Manufacturing

Dependent variable = Logarithm of real emolument per person	Fixed Effect Model (N=845, 57 Industries, 1993-94 to 2007-08, Unbalanced panel)			Random Effect Model (N=845,57 Industries, 1993-94 to 2007-08, Unbalanced panel)		
	Coefficient	Robust Standard error	P> |t|	Coefficient	Robust Standard error	P> |t|
Logarithm of real value of output per person	0.27	0.05	0.00	0.28	0.05	0.00
Constant	0.26	0.11	0.02	0.29	0.13	0.03
R square (fixed effect model) = 0.45, R square (random effect model) = 0.44, Between fixed effect and random effect models, using Hausman test, we accept the first one since the null hypothesis of difference in coefficients not systematic is rejected.						

Source: Estimated from data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation and Annual Survey of India reports

As we did for wage productivity relation, we use steps of estimation. For the pooled regression, we specify log of real emolument per person as a function of logarithm of real value of capital per person. Second, we add dummies for industries to the equation. Third, instead of industries, we have dummies time. Fourth, we add both dummies in respect of industries and time. Values of coefficients in respect of these models are 0.34, 0.21, 0.36 and 0.15. Then, we posit this relation in fixed effect and random effect contexts. We get more or less same coefficients from fixed and random effect models i.e. 0.21 (Table 2). Albeit a direct relation as predicted by the micro economic theory, sensitivity of real wage appears to be less elastic to capital labour ratio.

Table 2: Relationship between Capital Labour Ratio and Wage Rate in Indian Manufacturing

Dependent variable = Logarithm of real emolument per person	Fixed Effect Model (N=845, 57 Industries, 1993-94 to 2007-08, Unbalanced panel)			Random Effect Model (N=845,57 Industries, 1993-94 to 2007-08, Unbalanced panel)		
	Coefficient	Robust Standard error	P> |t|	Coefficient	Robust Standard error	P> |t|
Logarithm of real value of output per person	0.21	0.05	0.00	0.22	0.04	0.00
Constant	-0.69	0.06	0.00	-0.69	0.06	0.00
R square (fixed effect model) = 0.51, R square (random effect model) = 0.50, Between fixed effect and random effect models, using Hausman test, we accept the first one since the null hypothesis of difference in coefficients not systematic is rejected.						

Source: Estimated from data extracted from Annual Survey Industries (ASI) 1973-74-2003-04, EPW Research Foundation and Annual Survey of India reports.

[10] Net value added refers to output net of value raw material consumption.

Drawing cues from above patterns and inferences, in a short run profit maximising scenario, wages show direct but weak relationship productivity in Indian organised manufacturing. Moreover, wage rate appears to be weakly influenced by capital labour ratio. These findings indicate how tenacious wage-productivity relation in organised manufacturing is. While a school of scholars sees this situation emanating from lack flexibility in labour market due to archaic labour laws, the opposing school views that Indian labour market is hugely flexible that is quite manifest in the enormity of informal sector in India. If we see industrial relation as merely a source of nominal economies, then wage productivity relation entails to be driven by both process and product innovation.

Appendix 7: Wage Function

We posit the following model to assess determinants of wage:

Logarithm of wage = f(age, square of age, educational attainment, technical qualification, vocational education, social category, gender, area of residence, type of employment, Occupation, industry, state, error)

Table 1 shows that wage increases with age, but increases at a decreasing rate since coefficients of age is positive while sign of age square is negative. Compared to the base category not literates, coefficient tends to increase as level of educational attainment increases. It appears as the level of technical education increases, wage differential tends to go up. As given in table, compared to the reference category 'technical graduate', coefficients bear negative sign. Further, persons without any technical training report the lowest coefficient compared to other categories. However, there appears to be no significant wage differential for vocational training. Sources positive wage differential include the social category 'others', male, living in urban area, formal employment, and managerial occupation.

Table 1: Determinants of Wage for Regular Salaried/Wage Employees in Manufacturing 2009-10, (Age 15-64)

Dependent Variable = Logarithm of wage	Coefficient	Robust Standard Error	t	P>|t|
Age	0.0382033	0.004926	7.76	0.000
Age Squared	-0.0002861	0.0000689	-4.15	0.000
Educational Attainment (Reference Category = Not Literate)				
Just Literate	0.0644919	0.0400898	1.61	0.108
Primary Education	0.0854343	0.0331014	2.58	0.010
Upper Primary	0.178376	0.031914	5.59	0.000
Secondary	0.2977441	0.0323352	9.21	0.000
Higher Secondary/Diploma	0.3824941	0.036784	10.4	0.000
Graduate	0.6676822	0.0400201	16.68	0.000
Post Graduate	0.8477288	0.0533556	15.89	0.000
Technical Qualification (Reference Category=Technical Graduate)				
Diploma	-0.3329134	0.0773981	-4.3	0.000
PG Diploma	-0.2862034	0.0921537	-3.11	0.002
No Technical education	-0.5107059	0.0714217	-7.15	0.000
Vocational Training (Reference Category=Formal vocational Training)				
Informal Vocational Training	0.0241092	0.0429095	0.56	0.574
No Vocational Training	-0.0187112	0.0391441	-0.48	0.633
Social category (reference category = Scheduled Tribe)				
Scheduled Caste	-0.0104568	0.0531904	-0.2	0.844
Other Backward Classes	-0.0187041	0.0519066	-0.36	0.719
Others	0.1194542	0.0512017	2.33	0.020
Gender (1=Male, 0=Female)	0.368341	0.0298171	12.35	0.000
Area (1=Rural, 0=Urban)	-0.1108009	0.0181011	-6.12	0.000
Type of Employment (1=Formal, 0=Informal)	0.3984922	0.0201451	19.78	0.000
Occupation (1=Managerial staff, 0=Workmen)	0.3341947	0.0303136	11.02	0.000
Industry Dummy (NIC 2 Digit)	Yes			
State Dummy	Yes			
N = 5366, F(78, 5287) = 92.21, Prob > F = 0.0000, R-squared = 0.5617, Root MSE = .55388				

Source: Computed from National Sample Survey 66th Round Unit Records.

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Brief Glossary

Average Productivity - Productivity in economics refers to measures of output from production processes, per unit of input. Labour productivity in generalis held to be the same as the "average product of labour" i.e., average output per worker or per worker-hour, an output which could be measured in physical terms or in price terms.

Backward forward linkages - A forward linkage is created when investment in a particular project encourages investment in subsequent stages of production. A backward linkage is created when a project encourages investment in facilities that enable the project to succeed.

Behind the border constraints -This refers to a variety of nontariff barriers that operate inside countries rather than at the border, but that nonetheless can restrict trade. Examples include technical barriers to trade, labeling requirements, and sanitary and phytosanitary regulations.

Beyond the border barriers - These relates to barriers to investment that apply beyond the physical boundaries. It could be in the form of frictional costs to doing business; barriers to trade in services in terms of high transaction costs, etc.

Capital stock - One of the four basic categories of resources, or factors of production. It includes the manufactured (or previously produced) resources used to manufacture or produce other things. Common examples of capital are the factories, buildings, trucks, tools, machinery, and equipment used by businesses in their productive pursuits.

Capital/ Labour Ratio - The ratio of the quantity of physical capital to the quantity of labor, usually as employed in a particular industry, but sometimes referring to the entire factor endowment of a country. It is also sometimes referred to as capital intensity.

Casual worker - A person casually engaged in others farm or non-farm enterprises (both household and non-household) and getting in return wage according to the terms of the daily or periodic work contract is a casual wage labour. Usually, in the rural areas, a type of casual labourer can be seen who normally engage themselves in 'public works' activities. 'Public works' are those activities which are sponsored by Government or local bodies for construction of roads, bunds, digging of ponds, etc. and also employment generation scheme under poverty alleviation programs (According to National Sample Survey Organisation-NSSO)

Contract worker - A worker shall be deemed to be employed as "contract labour" in or in connection with the work of an establishment when he is hired in or in connection with such work by or through a contractor, with or without the knowledge of the principal employer."Contractor", in relation to an establishment, means a person who undertakes to produce a given result for the establishment, other than a mere supply of goods or articles of manufacture to such establishment, through contract labour or who supplies contract labour for any work of the establishment (The Contract Labour Act, 1970).

Control of Corruption Index (World Bank) - This indicator measures the extent to which public power is exercised for private grain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. It also measures the strength and effectiveness of a country's policy and institutional framework to prevent and combat corruption.The indicator is an index combining up to 21 different assessments and surveys, depending on availability, each of which receives a different weight, depending on its estimated precision and country coverage.

Corruption Index/Corruption Perception Index (Transparency International) - The CPI scores and ranks countries/territories based on how corrupt a country's public sector is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions. The CPI is the most widely used indicator of corruption worldwide. CPI draws on data sources from independent institutions specializing in governance and business climate analysis.

Deregulation - The reduction of government regulation of business, consumers, and market activity. The most noted period of deregulation occurred during the 1970s and 1980s in response to criticisms that economic regulation inhibited rather than promoted competition. Key industries deregulated during this period were transportation, communications, and banking industries. Social regulations were also relaxed.

DME (Directory Manufacturing Establishment) **-** A manufacturing enterprise, which is employing at least one hired worker on a fairly regular basis, is termed as manufacturing establishment. A manufacturing establishment employing six or more workers (household and hired workers taken together) is termed as Directory Manufacturing Establishment.

E-biz - Electronic business, or e-business, is the application of information and communication technologies (ICT) in support of all the activities of business. Commerce constitutes the exchange of products and services between businesses, groups and individuals and can be seen as one of the essential activities of any business. Electronic commerce focuses on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses. The term "e-business" was coined by IBM's marketing and Internet teams in 1996.

Economic liberalisation - Economic liberalization in India refers to ongoing economic reforms in India that started on 24 July 1991. After Independence in 1947, India adhered to socialist policies. Attempts were made to liberalize the economy in 1966 and 1985. The first attempt was reversed in 1967. Thereafter, a stronger version of socialism was adopted. The second major attempt was in 1985 by Prime Minister Rajiv Gandhi. In 1991, after India faced a balance of payments crisis, it had to pledge 20 tonnes of gold to Union Bank of Switzerland and 47 tonnes to Bank of England as part of a bailout deal with the International Monetary Fund (IMF

Emoluments - A salary, fee, or profit from employment or office

Employment elasticity - The rate of growth of employment relative to output growth

Employment per enterprise - Total number of employed persons within a given firm or an enterprise unit.

Environmental Goods and Services (EGS) - The Organisation for Economic Cooperation and Development (OECD) defined the EGS industry as follows: "The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimize or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. This includes cleaner technologies, products and services that reduce environmental risk and minimize pollution and resource use (OECD, 1999

Friend of environmental goods' group - Canada, the EU, Japan, Korea, New Zealand, Norway, Chinese Taipei, Switzerland and the United States.

FDI - The abbreviation for Foreign Direct Investment, this is the acquisition of controlling interest in foreign firms and businesses from one country in another country. FDI can also take the form of constructing factories, structures and equipment (or any form of physical capital) in foreign soil. FDI does not include foreign investment into the stock markets (portfolio investment).

Fixed capital - An input whose quantity cannot be changed in the time period under consideration. The most common example of a fixed factor of production is capital. A fixed factor of production provides the "capacity" constraint for the short-run production of a firm. As larger quantities of a variable factor of production, like labor, are added to a fixed factor of production like capital, the variable input becomes less productive.

Flexicurity system - Flexicurity (a portmanteau of flexibility and security) is a welfare state model with a pro-active labour market policy. The term was first coined by the social democratic Prime Minister of Denmark PoulNyrup Rasmussen in the 1990s. The term refers to the combination of labour market flexibility in a dynamic economy and security for workers.

Global production network - defined by Sturgeon (2001) as "a set of inter-firm relationships that bind a group of firms into a larger economic unit.

Global value chains - It is the full range of activities involved in creating, producing and delivering a product, when divided among several companies and spread across the world.

Gravity model - The gravity model of trade in international economics is similar to other gravity models in social science which predicts bilateral trade flows based on the economic sizes of (often using GDP measurements) the nations and distance between them. The volume of trade is inversely proportional to the distance while it increases with the increase in the size (GDP per capita) of the two nations.

HACCP Certification - Hazard analysis and critical control points or HACCP is a systematic preventive approach to food safety and biological, chemical, and physical hazards in production processes that can cause the finished product to be unsafe, and designs measurements to reduce

these risks to a safe level. In this manner, HACCP is referred as the prevention of hazards rather than finished product inspection. The HACCP system can be used at all stages of a food chain, from food production and preparation processes including packaging, distribution, etc.

Human Capital - Human capital is the stock of competencies, knowledge, social and personality attributes, including creativity, cognitive abilities, embodied in the ability to perform labor so as to produce economic value. Many theories explicitly connect investment in human capital development to education, and the role of human capital in economic development, productivity growth, and innovation has frequently been cited as a justification for government subsidies for education and job skills training

IIP - Index of Industrial Production is defined as the ratio of the volume of commodities produced within a specified group of industries in a given time period to the volume produced in the same group of industries in a specified base period (Department of Industrial Policy and Production)

Informal labour - Unorganised workers consist of those working in the unorganised sector or households, excluding regular workers with social security benefits provided by employers and the workers in the formal sector without any employment and social security benefits provided by employers

Informal sector - The informal sector or informal economy is that part of an economy that is not taxed, monitored by any form of government, or included in any gross national product (GNP), unlike the formal economy.

Inorganic industries - An industrial sector characterized by use of capitalist mode of production involving extensive use of modern technology. Production process is at the optimum stage of industrialization.

Job finding rate - The aggregate job-finding rate is defined as the ratio of the flow from another activity into employment to the number of people seeking jobs.

Labour compensation - Labour compensation per unit of labour input is defined as total compensation of employed persons divided by total hours worked. For all countries, for which data on hours worked are not available, labour input is approximated using compensation of employees and number of employee data.

License Raj/Permit Raj - License Raj or the Permit Raj refers to the elaborate licenses, regulations and accompanying red tape that were required to set up and run businesses in India between 1947 and 1990. The term plays off "British Raj", the period of British rule in India. It was coined by Indian statesman Chakravarthi Rajagopalachari, who firmly opposed it for its potential for political corruption and economic stagnation and founded the Swatantra Party to oppose these practices.

Labour market - A market that exchanges the services of labor resources. For the macro economy, this is a critical aspect of the aggregate resource markets, especially the short-run condition of rigid prices.

Labour Market Institutions - The labour market institutions shows the systems, dynamics and structures within labour markets that maintains the coordination between the constituents of the labour market. There are four recognized types of labor market institutions: minimum wages, employment protection regulation, unions and collective bargaining, and mandated benefits.

Labour Market Theories - Classical labor demand theory, which starts from the viewpoint that demands for labour is the outcome of employers' attempts at profit maximization.

Locked-in effect - Developing countries participating in GVCs often find themselves locked-into low value added activities. High value added tasks, from marketing to R&D, tend to present greater barriers to outsourcing or off-shoring. Thus, when they are, they tend to be of a more routine and less important nature than the same high value added activities in the home country (Globerman, 2011).

Lorenz Curve - In general, a diagram illustrating the degree of inequality and concentration for a group. This is accomplished by plotting the cumulative percentage of a total amount obtained by cumulative percentages of the group. A common use of the Lorenz curve is the distribution of income, in which the cumulative percentage of income is measured on the vertical axis and the cumulative percentage of the population is measured on the horizontal axis.

Man-days per workers - Amount of output produced in an industrial unit by a worker in a day

Marginal product - The change in the quantity of total product resulting from a unit change in a variable input, keeping all other inputs unchanged. Marginal product, usually abbreviated MP, is found by dividing the change in total product by the change in the variable input. Marginal product lies at the very foundation of the analysis of short-run production and the subsequent explanation of the law of supply and the upward-sloping supply curve, using the law of diminishing marginal returns.

NDME - A manufacturing enterprise, which is employing at least one hired worker on a fairly regular basis, is termed as manufacturing establishment. A manufacturing establishment employing less than six workers (household and hired workers taken together) is termed as Non-Directory Manufacturing Establishment.

Non tariff barriers - (NTBs) are trade barriers that restrict imports but are not in the usual form of a tariff. Non-tariff barriers to trade include import quotas, special licenses, unreasonable standards for the quality of goods, bureaucratic delays at customs, export restrictions,

OAME - A manufacturing enterprise, which is run without any hired worker employed on a fairly regular basis, is termed as Own Account Manufacturing Enterprise.

Organic/traditional industries - Those which are characterized by a pre-capitalistic method of production: that is to say, where production is at the pre-industrial revolution stage, where the dichotomy between agriculture and industry has not developed on a large scale.

Perfect Competition - An ideal market structure characterized by a large number of small firms, identical products sold by all firms, freedom of entry into and exit out of the industry, and perfect knowledge of prices and technology. This is one of four basic market structures. The other three are monopoly, oligopoly, and monopolistic competition. Perfect competition is an idealized market structure that's not observed in the real world. While unrealistic, it does provide an excellent benchmark that can be used to analyze real world market structures. In particular, perfect competition efficiently allocates resources.

PPDCs - Process and Product Development Centre for technological up gradation is one of the thrust areas of the Micro, Small and Medium Enterprises (MSME) Ministry to provide technological support and research services in technology up-gradation. PPDC serve the industry through research and development in areas of dense industry cluster, product design and innovation, product and process improvement and development of improved packaging Techniques, common facility centre and manpower development/training

Primary, secondary, tertiary sector - The primary sector of the economy is the sector of an economy making direct use of natural resources. This includes agriculture, forestry, fishing, mining, and extraction of oil and gas. The secondary sector of the economy or industrial sector includes those economic sectors that create a finished, tangible product: production and construction.

Profit Maximization - The process of obtaining the highest possible level of profit through the production and sale of goods and services. The profit-maximization assumption is the guiding principle underlying short-run production by a firm. In particular, it is assumed that firms undertake actions and make the decisions that increase profit. The profit-maximization assumption is the production counterpart to the utility-maximization assumption for consumer behavior.

Quantitative surveys - The use of sampling techniques (such as consumer surveys) whose findings may be expressed numerically, and are agreeable to mathematical manipulation enabling the researcher to estimate future events or quantities.
R&D Incidence- The rate of occurrence of innovation within firms in a given industry.

R&D Intensity - R&D intensity is often defined to be the ratio of expenditures by a firm on research and development to the firm's sales.

Real Wage - Real wages are defined as nominal wages (or wage in current money) adjusted for the price level. When price level changes the real wages change as well. If inflation is used to stimulate the economy, more labor will be demanded, conversely if the price level contracts, the result are a higher real wage.

Regular workers - Persons working in others farm or non-farm enterprises (both household and non-household) and getting in return salary or wages on a regular basis (and not on the basis of daily or periodic renewal of work contract) are the regular salaried/wage employees. The category not only includes persons getting time wage but also persons receiving piece wage or salary and paid apprentices, both full time and part-time (NSSO definition).

SEZ - Special Economic Zone (SEZ) is a geographical region within a country in which tax and investment incentives are implemented to attract foreign businesses and investments.

Sick industries - Industrial sickness is defined in India as "an industrial company (being a company registered for not less than five years) which has, at the end of any financial year, accumulated losses equal to, or exceeding, its entire net worth and has also suffered cash losses in such financial year and the financial year immediately preceding such financial year

SISI - The Small Industries Service Institute (SISI) are the field offices of Small Industries Development Organization (SIDO), Ministry of Small Scale Industries, Govt. of India, set up for the promotion and development of Small Scale Industries in the State in the early fifties. This Institute provides support / services to the State Government as well as co-ordinates various activities at the state level for promotion and development of small scale industries.

Skilled & unskilled workers - A segment of the work force with a high skill level that creates significant economic value through the work performed (human capital). Skilled labor is generally characterized by high education or expertise levels and high wages.

SME - Small and medium enterprises or small and medium-sized businesses are companies whose personnel numbers fall below certain limits. The abbreviation "SME" is used in the European Union and by international organizations such as the World Bank, the United Nations and the World Trade Organization.

Smiley curve - A smiley curve is an illustration of value-adding potentials of different components of the value chain in an IT-related manufacturing industry. The concept was first proposed by Stan Shih, the founder of Acer, an IT company headquartered in Taiwan, around 1992

Sunrise industries - A sunrise industry is one that is new or relatively new, is growing fast and is expected to become important in the future.

Sunset industries - A sunset industry is an industry in decline, one that has passed its peak or boom periods. As one example, analogue recording technologies for audio or video have been supplanted by digital equivalents; although analogue equipment is still offered, sales have declined dramatically and are not expected to recover, so this segment of the market has been branded a 'sunset industry.

Tariff barriers - A tariff is designed to make imports more expensive than domestically produced products. That is, a tariff barrier is a tax imposed upon imports to protect local industries and companies.

UPS - Usual Principal Status reflects the status of an individual over a reference period of one year. Thus a person is classified as belonging to labour force, if s/he had been either working or looking for work during longer part of the 365 days preceding the survey.

UPSS - The Usual Principal and Subsidiary Status (UPSS) concept was introduced to widen the UPS concept to include even those who were outside the labour force on the basis of the majority time criterion but had been employed during some part of the year on a usual basis. In the NSS 61st Round Survey, all those who were either un-employed or out of labour force but had worked for at least 30 days over the reference year were treated as subsidiary status workers. UPSS is thus a hybrid concept incorporating both the major time criterion and priority to work status.

Urban and rural areas - An urban area is characterized by higher population density and vast human features in comparison to the areas surrounding it. Urban areas may be cities, towns or conurbations, but the term is not commonly extended to rural settlements such as villages and hamlets.

VAG - Value added growth is a measure of output. Value added by an organization or industry is, in principle: revenue - non-labor costs of inputs.

Wages per workers - Wages (in real terms) earned by the worker in a given industry

WTO - Abbreviation for the World Trade Organization which is an international organization that oversees multilateral trade among nations. The WTO was established in 1995 by the Uruguay round of trade negotiations to replace the General Agreement on Tariffs and Trade (GATT) that had been in place for the preceding five decades. The WTO administers multilateral trade agreements, provides a forum for trade negotiations, handles trade disputes, monitors national trade policies, and provides technical assistance and training for developing countries. The WTO has about 150 member countries.

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