Manufacturing Growth & Employment Pattern in India Since 1990s

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Any policy regime in themanu facturing sector, especially in terms of investment and technological up-gradation, results into adjustments and re-adjustments of both industry and workforce in the short and long run. The present study addresses the trends and growth patterns of the organized manufacturing sector, how far it is affecting the level of employment in the sector as a whole and also at the sub-industry level, the quality of employment generated and the responsiveness of employment to wage rate and output growth. The study concludes that the reforms in the manufacturing sector though have boosted the manufacturing output,have not been able to fulfill the aims of inclusive growth.

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Introduction

The economic reforms of 1991 have enabled the Indian economy to cross the barriers of Hindu rate of growth. The gradual dismantling of industrial licensing, removal of import licensing for nearly all manufactured and capital goods; tariff reduction and relaxation of rules for foreign investment were all focused to improve the industrial efficiency, productivity and competitiveness of manufacturing industries on the one hand, and on the other, its spillover effects were expected to increase employment opportunities for the skilled, semi-skilled and poor people. The manufacturing sector offers greater prospect for capital accumulation, technical change and intersectoral linkages (Vinish Kathuria, et al. 2010). Thus the dynamic outward oriented manufacturing sector was presumed as a panacea for problems of unemployment and poverty.

There is a large body of literature on productivity growth, its components and determinants in the manufacturing sector in India. Studies are also available on the relationship between growth of manufacturing sector and employment. Few of

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them were found to be optimistic (Gersbach, 2000; Nickell, 1999; Papola, 2005). They opined that changing market conditions and the attraction of large investments, particularly foreign direct investment (FDI) would prompt greater flexibility in employment and utilization of labor. Majority of the scholars have found adverse relationship between growth of manufacturing output and employment (Sharma & Abraham, 2005; Kannan & Reveendran, 2009). They found that manufacturing industries performed quite well in terms of output during the post reform period, yet this performance was not reflected in employment growth. Many scholars have analyzed this issue of jobless growth and arrived at various reasons for it which include but are not limited to, job security regulations, increased wages, increased labor productivity, increased capital intensity, labor market flexibility, casualization, weakening of trade union strength among others (Goldar, 2000; 2002; Nagraj, 2000; Kannan & Raveendran, 2009; Bhalotra, 1998; Nath, 2008; Ghose, 2005; Deshpande et al., 2004; Pachanan Das, 2007). Various studies have found inconsistency between the manufacturing output growth and employment (Pushpangadan & Shanta, 2008; Bhalotra, 1998; Nath, 2008). According to Rajshri Majumdar (2008), globalization process is leading to further squeezing of the labor market. Goldar (2011) has found some mixed effects. During the early years of reforms, 1995-96 to 2003-04, employment in the organized manufacturing sector had fallen at the rate of 1.5 percent per annum while during 2003-04 to 2008-09 it increased at a very high rate of growth of 7.5 percent per annum, thus invalidating the impression of jobless industrial growth. Sharma (2006) and Papola (2008) have attributed this increase in employment to the relaxed enforcement of labor laws leading to flexible practices at the ground level.

High growth of services may not be sustainable without significant growth of the manufacturing sectors.

Industrial sector plays a dominant role in the development of the Indian economy. The industrial sector comprises all types of economic activities including mining, manufacturing, construction, electricity, gas and water supply. Among them, the manufacturing sector itself contributes 86 percent to the growth of the industrial sector (Economic Survey, 2011-12). The growth rate of manufacturing sector is 9.4 percent during 2011-12 and it is attracting about 79 percent of the foreign direct investment (FDI). It also contributes a major portion to the Indian exports (53%). But its contribution to employment is highly disappointing as it gives employment to only 17 percent of the work force. This might have an adverse effect on the aggregate demand. Also the services sector has grown at still higher rate in recent years, raising its share in the GDP much

faster than the industrial sector. This high growth of services may not be sustainable without significant growth of the manufacturing sectors (Pachanan Das, 2007).

Manufacturing sector is an important sector as it interlinks all the sectors of the economy. Any policy regime in this sector, especially in terms of investment and technological up-gradation, results into adjustments and re-adjustments of both the industry and the workforce in the short and the long run. Thus the problem relating to the impact of the growth of manufacturing sector on pattern of employment needs serious attention.

Against this backdrop, the focus of this paper is to find how the manufacturing sector in India is affecting the quantity and quality of employment. The objectives of the study are as follows:

1. To examine the growth pattern of the organized manufacturing sector in India since 1990s.
2. To determine the changes in the employment pattern in the organized manufacturing industries.
3. To determine the factors responsible for the inconsistent relationship between manufacturing output and employment in the organized sector.

Data & Methodology

This study is based on the data obtained from the Annual Survey of Industries (ASI) from 1990-91 to 2009-10 at 3-digit and 4-digit levels. ASI covers the industrial units registered under the Factories Act, 1948. The primary unit of enumeration in the ASI is a factory. The ASI records relevant figures on the basis of reporting units. As the number of non-reporting units varies randomly from year to year across states, we normalize the value of gross output and number of workers by the number of reporting factories. The wholesale price index for industrial products provided by the CSO is used in calculating real values of output from the nominal values. Industries were arranged as per the latest available industrial classification (NIC-2008) and made comparable through concordance. The estimates at the 2-digit level of industrial classification were then obtained by aggregating the relevant 3-digit and 4-digit level industries. All the monetary values were adjusted for 2004-05 prices by using the wholesale price indices relevant to specific industry group at 2-digit level.

The variables considered important to find the relationship between growth of manufacturing output and employment are as follows:

(a) Output: Gross value added (GVA) is used as the measure of output as in the empirical literature (Goldar, 1986; Ahluwalia, 1991; Balakrishna & Pushpangadan, 1994). Griliches and Ringsted (1971) argued that value added allows comparison between firms that are using heterogeneous raw materials.

(b) Labor: The total number of persons engaged is used as the measure of labor input. Since working proprietors/ owners and supervisory/ mana-

gerial staff have a significant influence on the productivity of a firm, the number of persons engaged is preferred to the total number of workers.

(c) Capital: Gross fixed assets (GFA) are used to represent capital input. GFA includes land, building and other construction, plant and machinery, transport equipment and tools and other fixed assets that have a normal economic life of more than one year from the date of acquisition.

A log linear specification is used to explore the variations in employment in manufacturing industries:

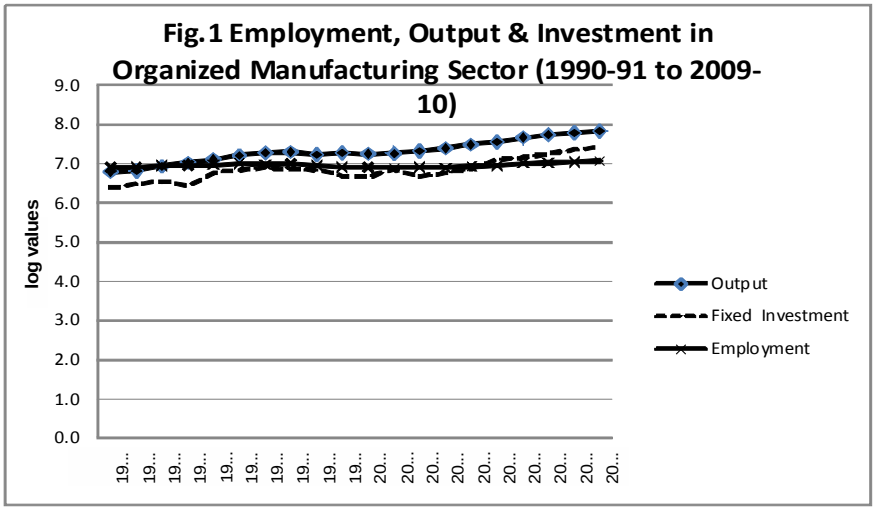
$$\ln(L) = \alpha + \beta_1 \ln(L_{-1}) + \beta_2 \ln(W) + \beta_3 \ln(Y) + u$$

Where L is labor, L_{-1} is labor with one year lag, w is real wage rate (product wage) and Y is output (real GVA). β's refer to the elasticity coefficients.

Trends of Output, Investment and Employment

Fig.1 plots the log values of real GVA, fixed investment and employment in the organized manufacturing sector for the period 1990-91 to 2009-10. During the two decades, output and fixed investment has increased 11 times while the employment has increased only1.4 times. So over a longer period and relative to output and investment, employment growth is surely modest. In the figure, a sustained increase in output and investment is visible since 2002. Employment has increased marginally in relation to the growth of output and investment. Besides the gap between the growth rate of output and that of employment has also increased after 2002.

Fig.1 Employment, Output & Investment in Organized Manufacturing Sector (1990-91 to 2009-10)



Growth Pattern

Among the indicators presented in Table1, those related to investment and output have shown continuous increase except some disturbances during 1998-99 to 2003-04. If the disturbance term is phased out, the estimates for 1990-91 to 1997-98 show that the fixed capital and GVA have increased about 3 times. Labor productivity has also increased about 3 times. GVA per unit of fixed capital has increased marginally. Persons per factory has increased upto 1995-96 by a small amount but after that it started decreasing.

Table1 Growth Pattern of Indian Manufacturing Industries (1990-91 to 2009-10)

Year	Fixed capital per unit (Rs. in lakhs)	Persons per unit	GVA per unit (Rs. in lakhs)	GVA/fixed capital (Rs. in lakhs)	Labor productivity (GVA/ Persons engaged)
1990-91	121.30	75.15	55.89	0.46	0.74
1991-92	135.28	74.09	58.93	0.44	0.80
1992-93	161.41	73.94	71.69	0.44	0.97
1993-94	184.56	72.68	86.26	0.47	1.19
1994-95	225.71	75.01	103.40	0.46	1.38
1995-96	258.95	75.96	121.14	0.47	1.59
1996-97	286.15	71.80	139.21	0.49	1.94
1997-98	311.06	74.06	145.75	0.47	1.97
1998-99	296.99	69.27	131.91	0.44	1.90
1999-00	305.47	62.12	143.34	0.47	2.31
2000-01	304.42	60.85	135.87	0.45	2.23
2001-02	336.03	60.29	142.54	0.42	2.36
2002-03	347.59	62.02	167.54	0.48	2.70
2003-04	366.71	60.97	191.97	0.52	3.15
2004-05	375.75	62.00	227.07	0.60	3.66
2005-06	433.03	65.01	260.20	0.60	4.00
2006-07	494.18	71.37	318.00	0.64	4.46
2007-08	577.34	71.40	377.60	0.65	5.29
2008-09	679.86	72.93	393.58	0.58	5.40
2009-10	850.55	74.23	432.52	0.51	5.83

Source: Annual Survey of Industries, Summary Results for Factory Sector

The growth of manufacturing sector was not supporting the growth of employment.

This indicates that the growth of manufacturing sector was not supporting the growth of employment. Rather the investment in capital was in favor of technological up-gradation that increased the labor productivity. This has resulted into restructuring and readjustments of the manufacturing and the employment sector. After 2003-04, the continuous increase in fixed capital per unit, labor productivity, GVA per unit in relation to persons employed is an evidence of the technological oriented manufacturing growth. In such a situation, the 2 times increase

in employment per unit of factory raises a question about the quality of employment. For this, it is necessary to find the manufacturing sub-sectors in which the employment has increased. Are they labor intensive sectors?

Distribution of Output & Employment

A disaggregated analysis of the manufacturing sector at the two-digit level of NIC-2008 shows that out of the 24 industries (Table 2), Chemical and Chemical Products (20) has played an important role in contributing to GVA till 1999-2000. In 2009-10, its place was taken by Basic Metals (24). But the share of both the industries in employment is just moderate varying between 5 percent and 8 percent.In particular, Food Products (10) and Textile Industry (13), which together have a 25 percent share in employment among manufacturing industries have been among the oldest and most significant labor intensive industries, but their share in employment is decreasing. Their share in GVA has become less than half in 2009-10. The industries having the highest labor intensity (Table3) is Wearing Apparel (14) followed by Tobacco Products (12), Wood and Products of Wood and Cork (16), Leather and related products (15), Textiles (13) and Food Products (10). Theoretically it was expected that trade liberalization would expand employment in these labor intensive industries. However, two industries namely Tobacco Products and Textiles have lost their employment at the rate of 0.30 and 0.11 percent per annum respectively. These two industries also lost their output at the rate of 3.85 and 2.19 percent per annum respectively.

The industry which is showing the maximum per annum increase in GVA is coke and refined petroleum products (19) but it has the minimum labor intensity (Tables 2 & 3). The other industries having high per annum increases in GVA are Electrical Equipment (27) and Pharmaceutical, Medicinal Chemical and Botanical Products (21). These industries also have very poor labor intensity. Repair and Installation of Machinery and Equipment (33) was the only industry in 1999-2000 with the highest share in GVA as well as employment. The industries that are poorly performing in terms of GVA have poor share in employment. Such industries are Wood and Products of Wood and Cork (16), Manufacture of Furniture (31), Repair and Installation of Machinery and Equipment (33) and Printing and Reproduction of Recorded Media (18). This implies that the industries with poor performance are associated with poor share in employment. Now which industries are responsible for the increase in the level of employment? Are they the labor intensive industries?

In Table 4, the industries are classified according to the increase/decrease in employment during the last decade. There are 13 industries, comprising 54 percent of the total industries, in which both the output and employment have increased. Out of them, two industries having NIC codes 15 and 16 are the labor intensive industries. Other industries in this category have

Table 2 Share of Industries in GVA & Employment (%)

NIC-2008	Description	2009-10		1999-2000		1991-92	
		Share in GVA	Share in Emp.	Share in GVA	Share in Emp.	Share in GVA	Share in Emp.
10	Food Products	6.66	12.96	7.84	14.23	9.42	14.99
11	Beverages	1.33	1.16	1.48	0.81	1.24	0.87
12	Tobacco Products	1.15	3.69	1.87	5.27	2.18	7.08
13	Textiles	5.41	12.17	6.93	13.63	12.67	20.75
14	Wearing Apparel	2.08	7.61	2.25	4.01	1.74	1.99
15	Leather and Related Products	0.82	2.24	0.74	1.36	1.03	1.48
16	Wood and Products of Wood and Cork, Except Furniture	0.24	0.66	0.21	0.56	0.39	0.91
17	Paper and Paper Products	1.17	2.01	1.37	1.96	2.66	2.25
18	Printing and Reproduction of Recorded Media	0.95	1.18	0.50	0.75	1.83	2.26
19	Coke and Refined Petroleum Products	8.33	1.08	3.08	0.80	3.77	0.75
20	Chemicals and Chemical Products	10.43	5.18	15.73	6.09	13.89	6.66
21	Pharmaceuticals, Medicinal Chemical and Botanical Products	6.23	3.65	3.05	2.02	3.91	2.28
22	Rubber and Plastics Products	3.96	4.20	3.36	3.04	1.99	2.03
23	Other Non-Metallic Mineral Products	7.09	7.04	4.62	5.04	7.06	4.54
24	Basic Metals	13.93	7.86	11.01	7.03	7.03	4.77
25	Fabricated Metal Products, Except Machinery and Equipment	3.94	4.92	2.19	3.13	2.93	3.55
26	Computer, Electronic and Optical Products	3.28	3.62	5.99	4.15	5.09	3.17
27	Electrical Equipment	4.85	3.90	2.09	1.85	5.83	3.97
28	Machinery and Equipment N.E.C.	6.82	4.94	3.73	3.63	4.52	3.73
29	Motor Vehicles, Trailers and Semi-Trailers	6.64	5.45	4.50	3.07	0.16	0.23
30	Other Transport Equipment	2.92	1.95	2.83	2.58	8.28	7.38
31	Manufacture of Furniture	0.28	0.44	0.27	0.28	0.00	0.00
32	Other Manufacturing	1.25	1.79	1.30	1.16	0.50	0.57
33	Repair and Installation of Machinery and Equipment	0.28	0.30	13.08	13.54	1.90	3.76
	All manufacturing	100	100	100	100	100.00	100.00

Source: Annual Survey of Industries, Summary Results for Factory Sector

moderate to low level of labor intensity. There are six industries in which both the output and the employment have decreased. Among them, Tobacco Product and Textiles are the labor intensive industries.

Table 3 Annual Average Change in GVA & Employment (%)

NIC-2008	Description	Annual average change in (%)		Labor Intensity (2009-10)
		GVA (2009-10/ 1999-2000)	Employment (2009-10/ 1999-2000)	
10	Food Products	-1.51	-0.89	0.34
11	Beverages	-1.01	0.43	0.15
12	Tobacco Products	-3.85	-0.30	0.56
13	Textiles	-2.19	-0.11	0.39
14	Wearing Apparel	-0.76	0.90	0.64
15	Leather and Related Products	1.08	0.65	0.48
16	Wood and Products of Wood and Cork, Except Furniture	1.43	0.18	0.49
17	Paper and Paper Products	-1.46	0.03	0.30
18	Printing and Reproduction of Recorded Media	9.00	0.57	0.22
19	Coke and Refined Petroleum Products	17.05	0.35	0.02
20	Chemicals and Chemical Products	-3.37	-0.15	0.09
21	Pharmaceuticals, Medicinal Chemical and Botanical Products	10.43	0.81	0.10
22	Rubber and Plastics Products	1.79	0.38	0.19
23	Other Non-Metallic Mineral Products	5.35	0.40	0.17
24	Basic Metals	2.65	0.12	0.10
25	Fabricated Metal Products, Except Machinery and Equipment	7.99	0.57	0.22
26	Computer, Electronic and Optical Products	-4.52	-0.13	0.19
27	Electrical Equipment	13.21	1.11	0.14
28	Machinery and Equipment N.E.C.	8.28	0.36	0.13
29	Motor Vehicles, Trailers and Semi-Trailers	4.76	0.78	0.14
30	Other Transport Equipment	0.32	-0.24	0.12
31	Manufacture of Furniture	0.37	0.57	0.28
32	Other Manufacturing	-0.38	0.54	0.25
33	Repair and Installation of Machinery and Equipment	-9.79	-0.98	0.19

Source: Annual Survey of Industries, Summary Results for Factory Sector

Table 4 Classification of Industries according to Increase / Decrease in Employment

		Employment	
		Increase	Decrease
Output	**Increase**	1. Leather and Related Products (15) 2. Wood and Products of Wood and Cork, Except Furniture (16) 3. Printing and Reproduction of Recorded Media (18) 4. Coke and Refined Petroleum Products (19) 5. Pharmaceuticals, Medicinal Chemical and Botanical Products (21)6. Other Non-Metallic Mineral Products (22) 7. Basic Metals (23) 8. Fabricated Metal Products, Except Machinery and Equipment (24) 9. Electrical Equipment (25) 10. Machinery and Equipment N.E.C. (27) 11.Motor Vehicles, Trailers and Semi-Trailers (28) 12. Manufacture of Furniture (29)13. Rubber and Plastics Products (31)	1. Other Transport Equipment (30)
Output	**Decrease**	1. Beverages (11) 2. Wearing Apparel (14) 3. Paper and Paper Products (17) 4. Other Manufacturing (32)	1.Food Products (10) 2.Tobacco Products (12) 3.Textiles (13) 4.Chemicals and Chemical Products (20) 5.Computer, Electronic and Optical Products (26) 6.Repair and Installation of Machinery and Equipment (33)

Source: Computed

In order to determine the quality of employment that is obtained in manufacturing industries, the variables like labor productivity, share of emoluments in gross value added, share of wages in gross value added and fixed assets per worker are taken into account (Table 5). Fixed assets per worker has increased from Rs.1.26 lakhs in 1991-92 to Rs.10.74lakhs in 2009-10. Labor productivity has registered an increase from Rs. 0.78 lakhs in 1991-92 to Rs. 5.71 lakhs in 2009-10. A continuous increase in investment has enabled firms to sustain the growth of labor productivity. This increased investment has enabled firms to practice substitution of workers with capital. The share of wages in total emoluments indicates the

A continuous increase in investment has enabled firms to sustain the growth of labor productivity.

cost of labor in the industry. As shown in Table 4, the share of wages in total emoluments has declined over time. Wages accounted for 66 percent of the total labor expenses in the manufacturing sector in 1991-92, which decreased to 4.73 percent in 2009-10 indicating the decrease in the cost of labor. This points to a strategy of the firms to substitute low-skilled workers with fewer high-skilled workers and thereby reap the productivity benefits. The resulting increase in GVA would be used for further investments. As a result, the share of wages in value added, which is an indicator of distribution in the industrial economy has worsened. Workers had a 21 percent share of value added in 1991-92, which decreased to 10 percent in 2009-10. This is an apparent sign of the weakening of bargaining power of labor in the manufacturing sector (Suresh Babu, 2009). The decrease in the share of emoluments from 33 percent in 1991-92 to 22 percent in 2009-10 shows the practicing of contract workers who are devoid of all the benefits of a regular employee.

Table 5 Quality of Employment in Manufacturing Industries

Year	Labor productivity (GVA / persons engaged) (Rs.in lakhs)	Share of emoluments in GVA (%)	Share of wages in GVA (%)	Share of wages in total emoluments (%)	Fixed assets per worker (Rs. lakhs)
1991-92	0.78	33	21	65.70	1.26
1999-2000	2.35	25	15	58.14	4.93
2009-10	5.71	22	10	4.73	10.74

Source: Annual Survey of Industries, Summary Results for Factory Sector

Regression Results

The estimated values of elasticity coefficients of employment with respect to one year lagged value of labor, wage rate and output are shown in Table 6. The elasticity coefficient of labor employment with respect to its lagged value is low in 1999-2000 as compared to 1991-92 but it increased in the 2009-10. This indicates the increase in the responsiveness of labor due to increase in flexibility in the labor market. The increase in the contractualization of labor is reflected from the elasticity coefficient with respect to wage rate which has decreased in 2009-10 as compared to 1999-2000. The elasticity coefficient of employment with respect to industrial output, though significant, is showing a decrease in the responsiveness of employment in 2009-10 compared to 1999-2000. The results indicate that the employment function is highly responsive to the lagged value of employment. This indicates that the past experiences of the labor regarding the quality of work, remuneration, industrial policies have a major influence on the employment in the present.

Concluding Observations

The policies of de-licensing, deregulation, foreign direct investment, in-

Table 6 Regression Results

Variables	2009-10		1999-2000		1991-92	
	β's	t- value	β's	t- value	β's	t- value
Constant	.186	.971	.111	.412	3.134	5.112*
L_{-1}	.848	9.025*	.134	5.023*	.436	4.592*
W	-.122	-.927	-.835	-7.116*	-.008	-.020
Y	.111	1.365**	.780	14.420*	.013	.169
R^2	.989		.963		.538	
Adjusted R^2	.974		957		.465	

*Significant at 5% level
**Significant at 10% level
Source: Computed

creased competition, easing of labor, etc. were associated with the strategies of cost-cutting adjustments, labor displacing and productivity enhancing technologies, sub-contracting of work force and profit expansion. As a result, the reforms that were expected to shift its industrial structure towards more labor intensive industries and provide greater encouragement to the application of labor intensive methods of production, failed to translate the output growth into employment growth. In the present study, it has been observed that with the advancement of technology, the productivity of labor has increased, but it has not benefited labor in terms of employment and wages. It is only after 2003-04, that some marginal increase in employment is observed. The disaggregated analysis of 2-digit industrial classification (NIC-2008) has shown that the industries which are performing well in terms of gross value added are not able to increase their employment share in the manufacturing industries. Out of the 24 industries, only in 17 industries increase in output is associated with the increase in employment share. But this increase in employment is very low as compared to its output growth. The decrease in the cost of labor and share of wages in GVA indicates that the workforce is not getting the benefits of regular employees. This indicates the practicing of sub-contracting of work force.

On the basis of this study, it can be said that with the increase in labor market flexibility the employment of labor has shown an increase indicating that the concept of jobless growth is no longer valid. On the other hand, the sub-contracting of labor has resulted into risk, uncertainty, insecurity and instability of jobs. If the benefits of the increase in labor productivity are not passed on to workers, it is likely to create severe aggregate demand deficiency sooner or later. It is concluded that the reforms in the manufacturing sector though have boosted the manufacturing output, have not been able to fulfill the aims of inclusive growth.

Thus there is the need to reconsider the issue of the growth of manufacturing industries and its impact on the quantity and quality of employment.

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