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IMPACT OF TRADE ON EMPLOYMENT GENERATION IN MANUFACTURING IN INDIA

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Impact of Trade on Employment Generation in Manufacturing in India

Bishwanath Goldar

Abstract: Analysing the impact of trade on manufacturing employment in India, it is found that exports had a favourable effect on industrial employment, but the positive effect of export increase was offset by the negative effect of increases in imports. The net effect was marginal. The failure of trade to raise industrial employment is traced primarily to the changing product composition of trade and the changing direction of trade. Petroleum products have emerged as a major item of India's exports whereas the traditional labour-intensive products have lost their share. The analysis reveals an adverse effect of changing factor prices on manufacturing employment. One interesting finding of the study is that after a long period of jobless growth, the corporate sector organized manufacturing has achieved in the last four years (2004-05 through 2007-08) a high rate of growth in employment, about 7 per cent per annum on average.

1. Introduction

In recent years, the Indian economy has been growing at a rapid rate. The average annual growth rate of the Indian economy during the period 2002-03 to 2007-08 was about 8.8 per cent. The growth rate was relatively faster in the non-agricultural sector than in the agricultural sector. Gross domestic product (GDP) at constant prices in manufacturing grew at the average annual rate of about 9.0 per cent and that in services grew at the average annual rate of about 10.0 per cent during the period 2002-03 to 2007-08.[1] By comparison, the average annual growth rate in real GDP in agriculture, forestry and fishing in this period was much lower at about 4.8 per cent.[2]

In spite of the relatively fast growth in output achieved by the manufacturing sector in recent years, the growth in employment in manufacturing has lagged far behind. Available employment data (based on the National Sample Survey (NSS) 56th and 61st

[1] *National Accounts Statistics*, Central Statistical Organization, Ministry of Statistics and Programme Implementation, Government of India.
[2] *National Accounts Statistics.*

round results)[3] reveal that, between 1999-00 and 2004-05, the growth rate of employment in manufacturing was about 4.8 per cent per annum.[4] Employment in manufacturing has probably grown at a similar pace (or at an accelerated pace) in subsequent years.

Much of the growth in employment in manufacturing in recent years has taken place in the unorganized segment of this sector. Also, there has been growing informal employment in the organized manufacturing sector. Thus, in terms of the quality of employment generated, manufacturing has not performed well.

The organized segment of manufacturing constitutes about a seventh (14 per cent in 2004-05) of the total employment in manufacturing, and the growth rate in employment in the organized segment has been quite low, if not negative. Employment data for organized manufacturing reported in the *Annual Survey of Industries* (ASI)[5] for the period 1998-99 to 2005-06 indicate a sluggish growth in employment at the rate of 0.6 per cent per annum. Data on employment in organized manufacturing brought out by the Ministry of Labour and Employment, Director General of Employment and Training (DGET)[6] indicate that employment in organized manufacturing fell at the rate of about 3 per cent per annum during the period 1999 to 2005.[7] These estimates of employment growth in organized manufacturing need to be contrasted with the growth rate in output of organized manufacturing. According to National Accounts data, the growth rate in real GDP in organized manufacturing was about 7.1 per cent per annum in the period 1998-99 to 2005-06, much higher than the growth rate in employment. Evidently,

[3] Government of India, National Sample Survey Organisation (2001, 2006).

[4] This estimate of employment growth rate is based on the estimates of employment made by Sundaram (2007) for 1999-00 and 2004-05. There is an issue of underestimation of employment for 1999-00 (see Unni and Raveendran, 2007) and the actual growth in employment in manufacturing during 1999-00 to 2004-05 may have been lower than what the employment estimates of Sundaram (2007) indicate. This is discussed further in footnote 13.

[5] *Annual Survey of Industries*, Central Statistical Organization, Ministry of Statistics and Programme Implementation, Government of India.

[6] Reported in *Economic Survey*, 2007-08, Government of India, page A-52.

[7] By contrast, estimates of employment in organized manufacturing derived by Sundaram (2008) from the NSS 55th and 61st round results indicate a growth rate of employment of 4.4 per cent per annum. Sundaram notes that the DGET figures on organized manufacturing employment understate the true employment in this sector and the degree of underestimation has increased over time. One would notice that Sundaram's estimates of employment growth in organized manufacturing are not consistent with the ASI data. His estimates seem to exaggerate the growth rate in employment achieved by organized manufacturing.

employment growth in organized manufacturing has lagged far behind the growth rate in output in that sector and also lagged behind the growth rate in employment in unorganized manufacturing (about 5.6 per cent per annum during 1999-00 to 2004-05).[8]

In terms of the quality of employment generated, the performance of manufacturing has been rather unsatisfactory, not only because the dominant part of the employment generation was in the unorganized sector (where the wages and other benefits to workers are relatively low) but also because there has been growing incidence of informal employment in the organized manufacturing sector. ASI data, for instance, reveal that the share of contract workers out of all workers employed in the organized manufacturing sector has increased from 13.9 per cent in 1995-96 to 19.7 per cent in 1999-00 and further to 26.4 per cent in 2004-05.[9]

Since the manufacturing sector in India has performed rather unsatisfactorily in generating employment in spite of the rapid output growth attained, it is important to investigate the slow growth in employment, in quantity as well as quality, and identify the reasons for this trend. Indeed, for achieving inclusive growth it is essential that the non-agricultural sectors generate more employment and better quality employment so that more and more workers may be shifted from low productivity jobs in agriculture to higher productivity jobs in manufacturing and services. One factor that is expected to have a significant effect on the employment situation in manufacturing is the radical changes that have taken place in India in its orientation to the international trade regime in the post-reform period. A study of the impact of trade on employment generation in manufacturing would therefore be useful for gaining an understanding of the causes of slow employment growth in manufacturing and how trade can be made a more potent tool for employment generation.

[8] The estimate of employment in unorganized manufacturing is derived from the estimate of employment in total manufacturing (Sundaram, 2007) and the employment figure for organized manufacturing reported in the *Annual Survey of Industries*, subtracting the latter from the former.

[9] The ratios for 1999-00 and 2004-05 are computed from data on workers directly employed and those employed through contractors. *Source*: Ministry of Labour and Employment, Government of India (taken from www.Indiastat.com). The ratio for 1995-96 is computed from ASI data.

Against this backdrop, the basic objective of the study is to assess the impact of trade on employment generation in the manufacturing sector in India. For this purpose, the trends in employment in manufacturing in the period 1998-99 to 2007-08 are studied for different industries/sectors, econometric models are estimated to assess the impact of trade on employment, and a decomposition analysis is carried out to quantify the contribution of changes in export intensity and import competition to employment growth.

Given that the divergence between employment and output growth is relatively more marked for the organized sector and that the availability of data is better for this sector, the study has laid a greater focus on the organized manufacturing. However, an attempt is made also to study the impact of trade on the unorganized manufacturing subject to the constraints of data availability.

The paper is organized as follows: The analysis of the impact of trade on employment in manufacturing is presented in Section 2, which is divided into several sub-sections. In the subsections, trends in employment for various industries/sectors are studied followed by a study of the trends in exports and imports. Then, an assessment of the effect on trade on employment generation is made. This is followed by a discussion on the use of contract labour in organized manufacturing in Section 3. The main conclusions of the study and policy recommendations are given in Section 4.

2. International Trade and Employment in Manufacturing

This section is divided into six sub-sections. The framework of analysis is presented first indicating the nature of decomposition analysis carried out later. Section 2.2 discusses the employment growth experience at broad sectors/industry group level. This is followed by a discussion of the trends in foreign trade in Section 2.3. In Section 2.4, an assessment of the impact of trade on employment in organized manufacturing is carried out. Such

analysis for unorganized manufacturing is presented in Section 2.5. An analysis of trends in employment in manufacturing in recent years and the effect of trade on employment in corporate sector manufacturing firms is presented in Section 2.6.

2.1 Framework of Analysis

The following identity provides a useful starting point of the empirical analysis:

$$\frac{\dot{L}}{L} = \frac{\dot{Y}}{Y} + \frac{\dot{l}}{l} \qquad \ldots(1)$$

or

$$G_L = G_Y + G_l, \qquad \ldots(2)$$

where L denotes labour (employment), Y denotes output and l denoted labour per unit of output (inverse of labour productivity). The dot denotes time derivative. Thus, the growth rate in labour employed (G_L) is the sum of the growth rate in output (G_Y) and the growth rate in the employment per unit of output (G_l).

Trade affects employment growth through its impact on the growth rate of output and on the growth rate of employment per unit of output. A rapid growth in exports in an industry, for instance, may raise the growth rate in output of the industry, and thus contribute to employment generation. But, it may simultaneously reduce the labour intensity of production (because more mechanized methods of production are brought into use) and thus tend to reduce employment growth. Alternatively, an increase in export orientation of an industry may be associated with changes in the product mix in favour of labour intensive products causing labour intensity to go up. A rapid increase in imports of a product may have an adverse effect on the output of the competing domestic industry and thus have an adverse effect on employment growth. Import competition may force the inefficient firms to quit and compel many other firms to introduce more mechanized methods of production both of which may have an adverse effect on labour intensity and hence on employment growth.

For the empirical analysis, the following decomposition scheme[10] has been used, which is broadly in line with the identity given above:

$$E_1 - E_0 = (C_1 - C_0)l_0 + Q_1(l_1 - l_0) + (M_0 - M_1)l_0 + (X_1 - X_0)l_0 \quad \cdots(3)$$

where E is employment, Q is real output, l is labour coefficient (=E/Q), C is domestic consumption (=Q-X+M), M is imports, and X is exports (both deflated). The subscripts, 0 and 1, are for the years at the beginning and end of the period for which the decomposition analysis is carried out. In the above equation, total change in employment between periods 0 and 1 is given by E_1-E_0. The impact of increase in domestic demand is captured by $(C_1$-$C_0)l_0$, and the impact of export expansion by $(X_1$-$X_0)l_0$. Employment displacement caused by increase in imports is captured by $(M_0$-$M_1)l_0$. This term is expected to be negative. The effect of changes in labour intensity on employment generation is captured by $Q_1(l_1$-$l_0)$. It shows the gap between the actual employment in period 1 and what it should have been if the labour intensity of period 0 had prevailed also in period 1.

A useful extension of the scheme of decomposition analysis given in equation (3) above is to split the change in labour intensity (Δl) into three parts namely: change due to increased export intensity, (Δl_X), change due to increased import penetration, (Δl_M), and change due to other factors, (Δl_O). Accordingly, $Q_1(l_1$-$l_0)$ may be written as:

$$Q_1(l_1 - l_0) = Q_1\Delta l_X + Q_1\Delta l_M + Q_1\Delta l_O \quad \ldots(4)$$

With this decomposition of $Q_1(l_1$-$l_0)$, the effect of export expansion on employment will be given by: $(X_1$-$X_0)l_0$+$Q_1(\Delta l_X)$, and the effect of increased imports will be given by: $(M_0$-$M_1)l_0$ +$Q_1(\Delta l_M)$.

[10] This decomposition analysis follows Krueger, et al. (1981). Such decomposition has been carried out in a number of more recent studies (for example, Dunne and Edwards, 2006; Erlat, undated)

A possible approach that may be taken to split (Δl) into (Δl_X), (Δl_M) and (Δl_O) is to base it on an econometrically estimated employment function. The function may be specified as:[11]

$$E = f(Q, w, X/Q, M/C, t), \quad \ldots (5)$$

where w denotes the real wage rate. The estimated coefficients of export-intensity (X/Q) and import penetration ratio (M/C) can be used to split (Δl) into its three parts.

2.2 Trends in Employment in Manufacturing

Employment in the manufacturing sector, organized and unorganized manufacturing combined, grew at the rate of 4.8 per cent per annum in the period 1999-00 to 2004-05 (Table 1). This rate of growth is higher than the average growth rate achieved during the previous four decades: about 3.1 per cent per annum during 1961 to 1987-88 and about 1.7 per cent per annum during 1987-88 to 1999-00.

The trends in employment growth in unorganized manufacturing match that of aggregate manufacturing.[12] This is not surprising because unorganized manufacturing accounts for a very large part of the employment in aggregate manufacturing — about 86 per cent in 2004-05. The growth rate in employment in unorganized manufacturing during the period 1999-00 to 2004-05 was about 5.6 per cent per annum (Table 1), which exceeded the growth rate achieved in the four previous decades — about 3.3 per cent per annum during 1961 to 1987-88 and about 1.7 per cent per annum during 1987-88 to 1999-00.[13]

[11] Such specification of the employment function has been used in several earlier studies. See, for example, Hine and Wright (1998) and Greenaway, Hine and Wright (1999).

[12] Employment in unorganized manufacturing is derived as the difference between the estimated total employment in manufacturing (based on NSS surveys) and the employment in organized manufacturing given in ASI.

[13] A qualification needs to be added here. The growth in employment in unorganized manufacturing between 1999-00 and 2004-05 reported in the table is based on the employment estimates of Sundaram (2007). There is a view that that the employment estimates for 1999-00 probably suffer from some degree of underestimation (Unni and Raveendran, 2007). This, if true, would imply that the growth rate in

Table 1: Growth rate of employment in manufacturing, 1961 to 2004-05

(Per cent per annum)

Period	Organized manufacturing	Unorganized manufacturing	Total Manufacturing
1961 to 1987-88	2.4	3.3	3.1
1977-78 to 1987-88	0.9	3.6	3.1
1987-88 to 1993-94	2.0	1.3	1.5
1993-94 to 1999-00	0.9	2.1	1.9
1999-00 to 2004-05	0.4	5.6	4.8

Source: Prepared from ASI data, Sundaram (2001, 2007) and Papola (2007).

While employment growth in unorganized manufacturing and total manufacturing has been relatively faster in the period 1999-00 to 2004-05 as compared to the growth achieved in the previous four decades, this has not happened in the organized manufacturing. Rather, the rate of employment growth in organized manufacturing in the period 1999-00 to 2004-05 was only about 0.4 per cent per annum (Table 1), which is lower than the growth rate achieved in the period 1961 to 1987-88 and in the period 1987-88 to 1993-94 (about 2.4 and 2.0 per cent per annum in the two periods, respectively). In the period 1993-94 to 2004-05 which covers most of the post-reform era, the growth rate in employment in organized manufacturing was only about 0.7 per cent per annum. Employment growth in unorganized manufacturing in this period was about 3.7 per cent per annum. As a result, the share of the organized sector in total

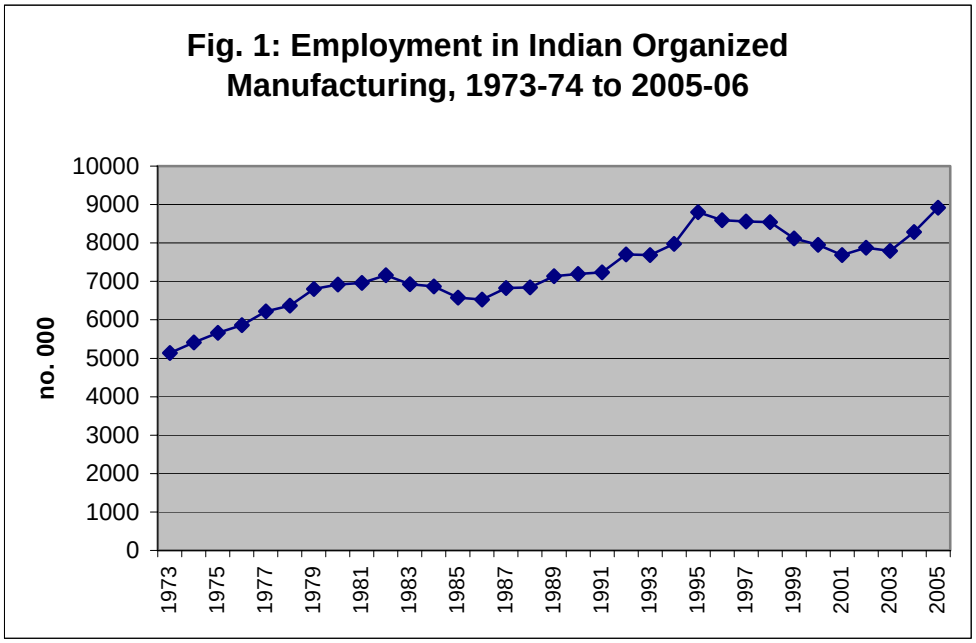
employment in unorganized manufacturing during 1999-00 to 2004-05 has been somewhat over-estimated. It is difficult to assess the degree of underestimation or whether it is present at all. It may be pointed out here that in a paper by Himanshu presented at a conference at the Delhi School of Economic (Employment Trends in India: A Fresh Look at Past Trends and Recent Evidence, February 2007; available at http://www.cdedse.org/conf2007/himanshu.pdf, accessed March 25, 2009), the issue of underestimation has been investigated and it has been argued that the 61st round NSS data on employment are comparable to such data of the 50th and 55th round. It may be noted further that the work participation rates (usual status, PS+SS) in the 55th round are more or less in line with the work participation rates (WPR) in the 54th (January-June, 1998) and 56th (2000-01) round (thin sample). In the case of rural males, the WPR for 1999-00 is slightly lower than that for 1998 and 2000-01(531 compared to 539 and 544). But, the gap is not as much as between the 50th round and 55th round (531 as against 553). It may be added that among urban male (who form a substantial part of workers in manufacturing) the WPR in the 55th round is nearly the same as in the 50th round. It seems therefore that even if there is some degree of underestimation of employment in manufacturing in the estimates made by Sundaram for 1999-00, the extent of underestimation is not large. Accordingly, it seems reasonable to conclude that employment growth in unorganized manufacturing between 1999-00 and 2004-05 was about 5 per cent per annum or higher.

employment in manufacturing has fallen from about 18 per cent in 1993-94 to about 14 per cent in 2004-05.

It is evident from Table 1 that the often-discussed issue of 'Jobless industrial growth' basically concerns the organized manufacturing sector,[14] and does not seem very relevant for the unorganized component of Indian manufacturing. A detailed discussion on employment growth in organized manufacturing therefore follows, and after that the experience of the unorganized sector is taken up.

2.2.1 Employment Growth in Organized Manufacturing

Employment in organized manufacturing in the period 1973-74 to 2005-06 is shown in Fig. 1.[15] It may be seen from the graph that there was an upward trend in employment in



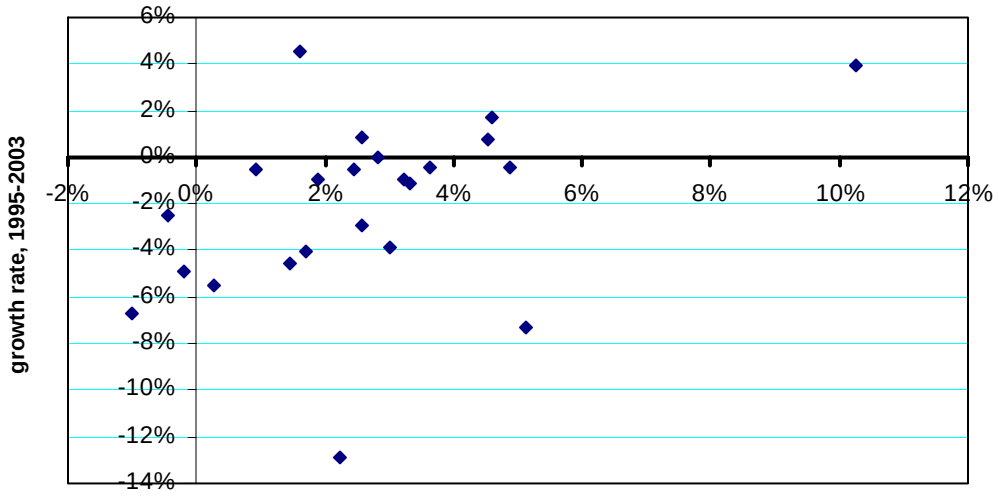
the periods 1973-74 to 1982-83 and 1987-88 to 1995-96, with a short period of falling employment in between. Employment in organized manufacturing grew at the trend rate of 1.6 per cent per annum in the period 1973-74 to 1995-96. There was a downward trend

[14] A recent paper on jobless growth in Indian manufacturing is by Kannan and Raveendran (2009).
[15] Based on employment data reported in ASI.

in employment since 1995-96. During the period 1995-96 to 2003-04, employment in organized manufacturing fell at the trend rate of –1.6 per cent per annum (Fig. 1). In the next two years, employment in organized manufacturing increased at the average rate of about 7 per cent per annum. But, even with this increase in employment in 2004-05 and 2005-06, the trend growth rate in employment in the period 1995-96 to 2005-06 was –0.5 per cent per annum, whereas the trend growth rate in real GDP in registered (organized) manufacturing was about 5.7 per cent per annum in this period.[16] Thus, the period 1995-96 to 2005-06 (particularly the period up to 2003-04) may indeed be regarded as a period of jobless growth in organized manufacturing in India.

Analysis of the rates of growth in employment at the two-digit industry level[17] for the period 1973-74 to 2003-04 reveals that there was a marked fall in the growth rate in employment in the post-1995 period in almost all cases (Fig. 2). In many cases, the

Fig 2: Employment growth rate (%p.a.), 2-digit industries, during 1973-1995 and 1995-2003



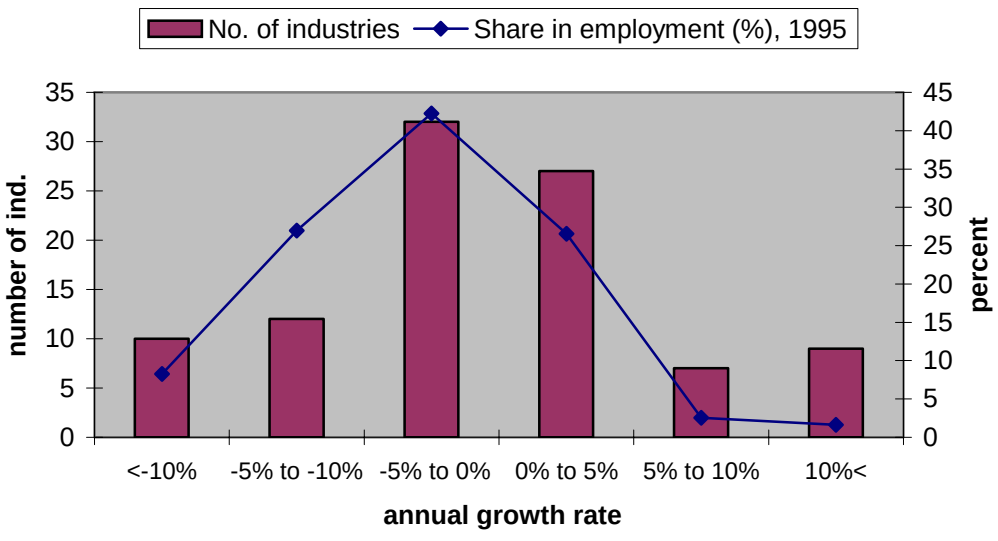
Note: The dots show the growth rates achieved by various two-digit industries in the two periods.

[16] *National Account Statistics*.
[17] This is based on the dataset prepared by the Economic and Political Weekly Research Foundation using the results of ASI (EPWRF, 2007).

growth turned negative from positive. In several other cases, the growth rate changed from low negative to higher negative. The most marked fall in the employment growth rate took place in transport equipment other than motors, trailers and semi-trailers (from +2 per cent per annum to –12.9 per cent per annum) and radio, television and communication equipment and apparatus (from +5.1 per cent per annum to –7.3 per cent per annum). Other cases of significant fall in the growth rate of employment in the post-1995 period include manufacture of wearing apparel, dressing and dyeing of fur; manufacture of non-electrical machinery; manufacturing of basic metals; printing, publishing and reproduction of recorded media; and cotton ginning and such agriculture related activities.

Analysis of employment growth among various four-digit industries (97 industries) in the period 1995-96 to 2003-04 (a period of negative employment growth in organized manufacturing at the aggregate level) reveals that the growth rate varied widely across industries (Fig. 3). While some industries experienced a steep fall in employment at a rate of over 10 per cent per annum, some others achieved a steep increase in

Fig. 3: Employment growth rate, 4-digit industries, 1995-96 to 2003-04, and their share in employment (1995)



Note: Number of industries, left scale; share in employment, right scale.

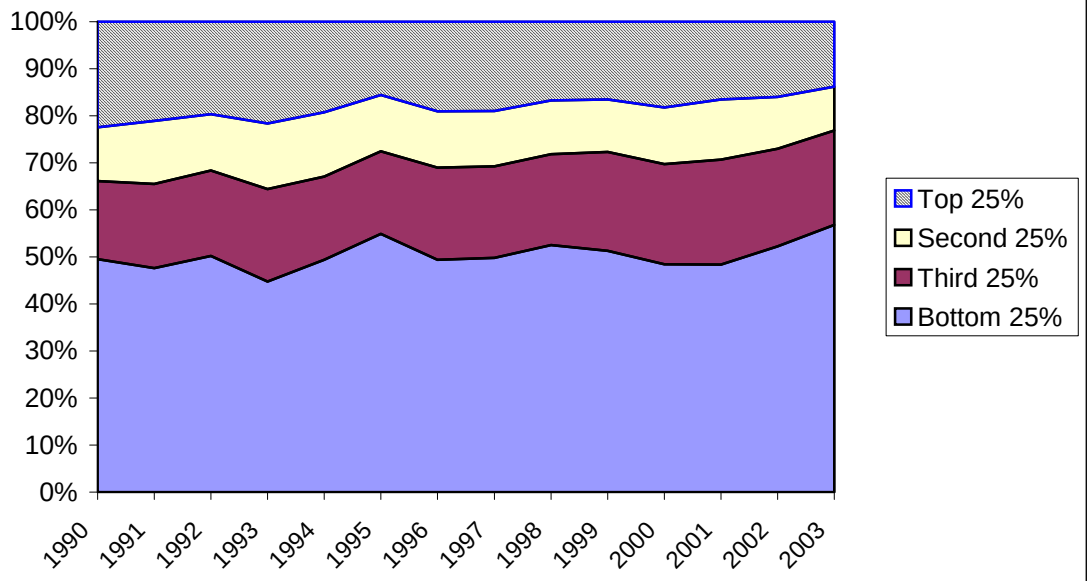
employment at the rate of over 10 per cent per annum. But, there is an important difference between the industries that experienced a significant increase in employment and those that experienced a significant fall. The weight of industries (employment share in 1995-96) that experienced a significant fall in employment was much greater than the weight of industries that experienced a significant increase. [18]

Twelve four-digit industries experienced a fall in employment at the rate of 5 to 10 per cent per annum and had among them a weight about 0.25. It appears therefore that these industries were responsible in a major way for the fall in employment in organized manufacturing at the aggregate level. These industries include manufacture of vegetable and animal oils and fats; manufacture of cutlery, hand-tools and general hardware; manufacture of electric lamps and lighting equipment; manufacture of radio, television, and sound and video recording equipment; and preparation and spinning of textile fibers.

Attention may be drawn here to a negative correlation between employment growth rate during 1995-96 to 2003-04 and the level of labour intensity of the industry. The correlation coefficient is –0.12. A similar negative correlation exists between labour intensity and output growth. The consequence of such negative correlation is a fall in the relative share of labour-intensive industries in industrial output. To examine this aspect, the four-digit industries have been ranked according to labour intensity (employment-value added ratio), and the shares of top 25 per cent, second 25 per cent, third 25 per cent and bottom 25 per cent of industries, so ranked, in real gross value added in various years during 1990-91 to 2003-04 have been computed. This is depicted in Fig. 4. A downward trend in the share of the top 25 per cent and an upward trend in the share of bottom 25 per cent are clearly visible. The implication is a decline in the labour intensity of Indian (organized) industry arising from compositional changes. An adverse effect of such change in industrial composition on employment growth is obvious.

[18] For this part of the analysis, a dataset on employment and real gross value added for four-digit industries for the period 1990-91 to 2003-04 prepared in a study undertaken at the ICRIER for the National Manufacturing Competitiveness Council, Government of India (ICRIER, 2008) has been used. The author is grateful to the research team at the ICRIER that undertook to above-mentioned study for making the data available.

Fig. 4: Distribution of real value added amoung industries ranked by labour intensity



Note: The industries have been ranked according to labour intensity, and then the top 25%, second 25%, third 25% and bottom 25% have been taken.

Another aspect that needs to be discussed here is the employment in the public sector enterprises within organized manufacturing. This is important to consider since there is a sharp contrast between public sector and private sector industrial enterprises in terms of employment growth achieved. Table 2 shows, for select years, employment in organized manufacturing by type of organization. It is clearly seen from Table 2 that employment in public sector industrial units fell from about 2.2 million in 1995-96 to only about 0.3 million in 2003-04. This explains a large part of the observed decline in employment in organized manufacturing at the aggregate level.

Table 2: Employment in Organized Manufacturing by type of organization

Type of organization	Employment (000)			Growth rate (% p.a.)	
	1988-89	1995-96	2003-04	1989-90 to 1995-96	1995-96 to 2003-04
Unincorporated Enterprises	2073	2419	2347	2.23	-0.38
Public Limited Company	2489	3555	2957	5.22	-2.28
Private Limited Company	1349	1473	1930	1.26	3.44
Departmental enterprises and other public corporations	1414	2197	314	6.50	-21.59
Cooperatives and others	419	401	321	-0.63	-2.74
Total	7744	10045	7870	3.79	-3.00

Source: Annual Survey of Industries. Total ASI is considered for this table. Thus, units engaged in manufacturing, recycling, repair services, gas and water supply and cold storage are included.

It may be pointed out here that the employment figures reported in Table 2 are estimates for the total ASI sector, and there has been a change in the industrial coverage of ASI from 1998-99 onwards, which has affected the comparability of the estimates (see Kannan and Raveendran, 2009). The power generation and distribution industry has been excluded from ASI from 1998-99. If employment in power generation and distribution (about one million in 1997-98, mostly in the public sector) is not taken into account, the fall in employment in public sector industrial enterprises will be much less severe that what Table 2 indicates. Nonetheless, there is no doubt that there was a significant fall in employment in public sector industries in the period after 1995 reflecting possibly a process of labour rationalization and public sector downsizing.[19] Table 3 shows employment levels in select public sector enterprises, and a fall is seen in almost all cases. According to DGET data, employment in public sector manufacturing fell from 1.76 million in 1995 to 1.13 million in 2005. Evidently, the fall in employment in public

[19] Going by the figures on employment reported in the ASI, employment in departmental enterprises fell from about 680,000 in 1997-98 to about 44,000 in 2003-04. One should not interpret this as an actual fall in employment. Rather, this seems to be a result of the decision of not covering department enterprises under ASI from 1999-00. According to ASI data, employment in public corporations fell from 1.40 million in 1997-98 to 0.27 million in 2003-04. This seems to be mostly a reflection of the exclusion of electricity undertakings from 1998-99.

sector manufacturing enterprise would explain to some extent the observed decline in employment in organized manufacturing

Table 3: Employment in Public Sector Enterprises, 1995-96 and 2005-06

Enterprises	Employment		
	1995-96	2005-06	% Change
Steel Authority of India Ltd.	182787	138211	-24.4
Indian Oil Corporation ltd.	33287	30048	-9.7
National Jute Manufacturers Corporation Ltd.	30050	19746	-34.3
Rashtriya Ispat Nigam Ltd.	17625	16574	-6.0
Bharat Petroleum Corpn. Ltd.	11499	13876	20.7
Bharat Electronics Ltd.	17044	12262	-28.1
Bharat Earth Movers Ltd.	15645	11975	-23.5
Hindustan Petroleum Corpn. Ltd.	11209	10778	-3.8
Mazagon Dock Ltd.	10293	8090	-21.4
Goa Shipyard Ltd.	2179	1543	-29.2
Garden reach Shipbuilders and Engineers Ltd.	8750	5088	-41.9
NTC (South Maharashtra) Ltd.	12183	4778	-60.8
National Fertilizers Ltd.	6805	4769	-29.9
Bharat Heavy Electricals Ltd.	66521	42601	-36.0
Rashtriya Chemicals and Fertilizers Ltd.	5799	4197	-27.6
Hindustan Shipyard Ltd.	4708	3523	-25.2
Bharat Heavy Plate and Vessels Ltd.	3940	1453	-63.1
Hooghly Dock and Port Engineers ltd.	1320	718	-45.6
Fertilizers and Chemicals (Travancore) Ltd.	8112	4030	-50.3
Hindustan Latex Ltd.	2160	1801	-16.6
Mishra Dhatu Nigam Ltd.	1373	1319	-3.9
Bengal Chemicals and Pharmaceuticals Ltd.	816	1135	39.1

Analysis of employment growth in organized manufacturing by types of organization for more recent years (Table 4) brings out that while employment at the aggregate level has grown at the rate of about 7-8 per cent per annum, employment in government departmental enterprises and public corporations has fallen. Interestingly, employment in public limited companies has also fallen between 2003-04 and 2005-06. The increase was mostly confined to private limited companies, individual proprietorship and partnership enterprises.

Table 4: Employment in Organized Manufacturing ('000)

Type of Organization	2003-04	2004-05	2005-06	Growth rate, 2003-06 % p.a.
1. Individual Proprietorship	771	871	962	11.7
2. Joint Family (HUF)	83	75	81	-1.2
3. Partnership	1494	1656	1760	8.6
4. Public limited company	2957	3068	2837	-2.1
5. Private limited company	1930	2203	2888	22.3
6. Govt. Dept. Enterprises	44	34	31	-16.8
7. Public Corporation	270	246	239	-5.8
8. Corporate Sector (4+5+6+7)	5201	5551	5996	7.4
9. Khadi & Village Industry	8	10	9	1.8
10.Handloom Industry	4	4	2	-21.8
11.Co-operative Society	284	256	269	-2.6
12.Others (Incl NR)	25	31	33	14.5
TOTAL	7870	8454	9112	7.6

Source: Annual Survey of Industries. Total ASI is considered for this table. Thus, units engaged in manufacturing, recycling, repair services, gas and water supply and cold storage are included.

2.2.2 Unorganized manufacturing

Estimates of total employment in unorganized manufacturing for 2000-01 and 2005-06 given in the Reports of the National Sample Survey Organization (56th Round and 62nd Round),[20] based on surveys undertaken of unorganized manufacturing enterprises, are 37.1 million to 36.4 million, respectively. This shows a slight fall in employment between these two years. This may be contrasted with the estimates of employment in unorganized manufacturing made by Sundaram (2008) on the basis of unit records of the employment-unemployment surveys of the NSSO for 1999-00 and 2004-05. This was done by making use of replies to a set of questions that were canvassed about the form of organization of enterprise, called enterprise type, in which a usual (principal) status worker in non-agricultural activities is at work. These estimates are 34.36 million for 1999-00 and 43.60 million for 2004-05. Going by these estimates of employment, the growth rate in employment in unorganized manufacturing in this period was about 5 per

[20] See Government of India, National Sample Survey Organization (2002, 2008).

cent per annum. Between the two estimates, the latter seem to be more plausible than the former. Hence for further analysis, the latter estimate, i.e. the one made by Sundaram (2008) has been adopted.

To study the inter-industry difference in the growth rates of employment in unorganized manufacturing, the reported industry-wise estimates have been taken from the NSSO reports, but these have been proportionately adjusted to match the estimates of total employment in unorganized manufacturing provided by Sundaram (2008). The estimates of Sundaram are for 1999-00 and 2004-05 while the survey results for unorganized manufacturing are for 2000-01 and 2005-05. The estimated total for 1999-00 has been distributed among industries using the available distribution for 2000-01, and similarly, the estimated total for 2004-05 has been distributed among industries using the distribution for 2005-06. The estimates of employment obtained this way for nine groups of industries and the growth rate in employment in the nine groups are shown in Table 5.

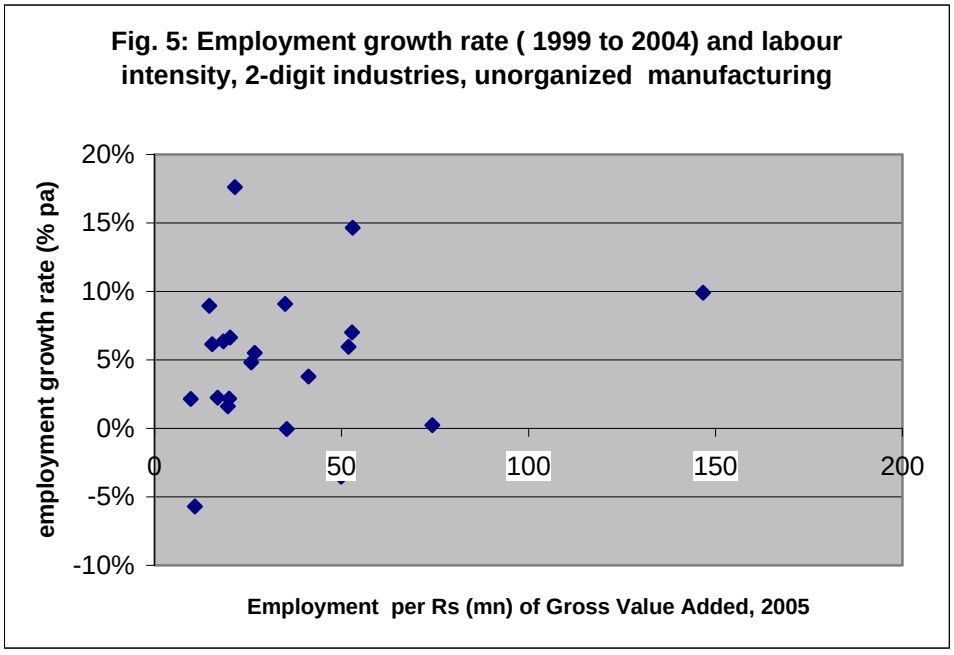
Table 5: Employment Growth, Unorganized manufacturing

Industry group	**Employment (00)**		**Growth rate (per cent per annum)**
	1999-00	**2004-05**	**1999-00 to 2004-05**
Food, beverages, tobacco	94489	126272	6.0
Textiles and leather	102589	140662	6.5
Wood, paper, printing	57521	57771	0.1
Chemicals, petrochemicals, rubber, plastics	8492	13932	10.4
Non-metallic mineral products	28057	27976	-0.1
Basic metals	1216	1352	2.1
Metal products, machinery	22128	30826	6.9
Transport equipment	1574	2425	9.0
Others	27505	34792	4.8

From the employment growth rates presented in Table 5, it is seen that in most groups, employment in unorganized manufacturing grew at the rate of 6 per cent per annum or above. On the other hand, in three groups, there was very little increase in employment between 1999-00 and 2004-05. These are wood, paper and printing; non-metallic mineral products; and basic metals.

An interesting point to note about employment growth in unorganized manufacturing is that there is a positive correlation between employment growth achieved by various two-digit industries of unorganized manufacturing in the period 1999-00 to 2004-05 and the level of labour intensity (number of workers per Rs million of gross value added, in 2005-06). These two variables are plotted in Fig. 5. The correlation coefficient is 0.18. There are two industries which are relatively more labour intensive but have not achieved a significant employment growth. These are wood and wood products, and paper. If these two industries are excluded, the correlation coefficient increases to 0.32. Evidently, employment growth in unorganized manufacturing has been relatively faster in labour-intensive industries. This may be contrasted with the situation in the organized manufacturing, where employment growth has been relatively slower in labour-intensive industries (as indicated by Fig. 4).

Fig. 5: Employment growth rate (1999 to 2004) and labour intensity, 2-digit industries, unorganized manufacturing



2.3 Changes in Commodity Composition and Direction of Trade

The trade orientation of Indian manufacturing has increased substantially in the post-reform period reflecting primarily the effects of policy changes. In the 1990s, manufactured exports grew faster than imports, resulting in a balance of trade surplus in manufactures. Later, imports grew relatively faster, and the gap was narrowed. Trade in manufactured products (exports plus imports) as a ratio to value of gross output of organized Indian manufacturing increased from 19 per cent in 1990-91 to 62 percent in 2006-07. Clearly, the degree of trade openness has increased substantially in the post-reform period. It would be interesting to examine how the commodity composition and the direction of trade have changed in the post-reform period.

2.3.1 Commodity composition

Significant changes have taken place in the commodity composition of India's exports and imports of manufactured products in the post-reform period. Though, going by the conventional trade theory, there are reasons to expect the exports basket to shift in favour of labour-intensive products, and the imports basket to shift in favour of capital-intensive products, this has actually not happened. Table 6 shows the relative shares of different types of products in India's exports of manufactures in the years 1996-97 to 1998-99 and 2005-06 to 2007-08.

Table 6 brings out clearly that petroleum products have over time become a major item of India's exports. The share has risen from about 2 per cent in 1996-97 to about 19 per cent in 2007-08.[21] By contrast, the relative shares of cotton yarn, fabrics, made up

[21] Between 2002-03 and 2007-08, exports of petroleum products increased from US$ 2.25 billion to US$ 26.77 billion. Exports of petroleum product from India are dominated by exports of HSD, accounting for about 44 per cent of the exports (in 2007-08). Aviation turbine fuel and motor spirit account for another 24 per cent. Examining the destination-wise breakup of exports, it is found that Netherlands, Singapore and UAE are important destinations of India's exports. Available information indicates that the capacity of production of petroleum products in India will go up substantially in the coming years well in excess of the increase in domestic consumption. This is likely to lead to further increases in the exports of petroleum products. The production capacity in April 2007 was about 149 million metric tonnes per year while domestic consumption during 2007-08 was about 129 million metric tonnes (*Source*: Petroleum Planning and Analysis Cell). According to some write-ups available on the Internet, the production capacity is

articles, and readymade garments have fallen. The shares of leather and leather products, and gems and jewellery have also fallen. In terms of employment generation, industries such as textiles, readymade garments, leather and leather products, and gems and jewellery have a distinct edge over petroleum refineries, and the changes in the commodity composition of exports must have had an adverse effect on employment generation.

Table 6: Composition of India's Exports of Manufactured Products

(relative shares, per cent)

Product	1996-97	1997-98	1998-99	2005-06	2006-07 R	2007-08 P
Tea	1.11	1.80	1.99	0.46	0.41	0.39
Coffee	1.52	1.62	1.52	0.42	0.41	0.36
Processed fruits, juices,	1.16	0.62	0.63	0.42	0.38	0.41
Sugar and molasses	1.15	0.24	0.02	0.16	0.68	1.09
Leather and manufactures	6.08	5.90	6.15	3.16	2.86	2.66
Basic chemicals, Pharmaceuticals & cosmetics	9.46	10.04	9.83	10.68	10.38	10.35
Plastic and linoleum products	2.04	1.83	1.75	3.30	3.08	2.60
Rubber, glass, paints, enamels and products	2.59	2.53	2.34	2.46	2.25	2.19
Residual chemicals and allied products	0.73	1.24	0.93	0.84	0.71	0.72
Iron & steel	2.92	3.11	2.14	4.15	4.96	4.23
Manufacture of metals	3.46	3.64	3.85	4.95	4.81	5.45
Machinery and instruments	4.00	4.25	4.28	5.94	6.37	6.76
Transport equipment	3.67	3.31	2.82	5.06	4.69	5.45
Electronic goods	2.97	2.70	1.86	2.54	2.70	2.56
Other engineering products	1.78	1.97	1.58	2.77	4.43	4.09
Cotton yarn, fabrics, made ups, etc.	11.82	11.62	10.26	4.62	4.00	3.50
Man made yarn, fabrics,	2.66	2.86	2.59	2.29	2.09	2.22
Readymade garments	14.22	13.79	16.16	10.09	8.42	7.36
Other textiles	4.01	3.93	3.81	2.20	1.95	1.67
Gems and jewellery	18.00	19.02	21.96	18.17	15.14	15.25
Handicrafts	1.80	1.87	2.34	0.54	0.41	0.36
Petroleum products	1.83	1.26	0.33	13.62	17.70	19.29
Other manufactured products	1.01	0.84	0.85	1.15	1.15	1.05
Total	100.00	100.00	100.00	100.00	100.00	100.00

Note: R=revised, P= provisional.
Source: Reserve Bank of India: *Handbook of Statistics on Indian Economy*.

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expected to be rise to 242 million metric tonnes per annum by 2012 (with implementation of a number of refineries) as against the projected annual domestic consumption of about 196 million tonnes. With the widening of the gap between capacity and domestic consumption, the exports of petroleum products is expected to increase substantially in the coming years, and the share of petroleum products in India's total exports may go up.

Employment per million rupees of gross output is in the range of 0.4 to 1.8 in textiles, leather products, and gems and jewellary (in 2003-04). But, in petroleum refineries, the relevant ratio is about 0.03 persons per million rupees of gross output. If the relative shares of these products in India's exports in 2007-08 were the same as in 1996-97, the production of textiles, leather products, and gems and jewellary would have been higher and the production of petroleum products would have been lower, which would have led to an additional employment of about 1.6 million persons, wiping out the employment loss of a little over one million that has taken place between 1995 and 2003. The computations are presented in Table 7.

Table 7: Employment effect of changes in commodity composition of exports

Product	**Relative share in exports (%)**		**Value of exports in 2007-08 (US$ mn)**		**Employment per million US$ of production**	**Additional employment if the relative shares had not changed**
	1996-97	**2007-08**	**Actual**	**Counter-factual**		
Cotton yarn, fabrics	11.82	3.50	4511	15246	56.1	602234
Readymade garments	14.22	7.36	9492	18330	83.2	735322
Leather & products	6.08	2.66	3432	7842	41.4	182574
Gems and Jewellary	18.00	15.25	19657	23211	17.6	62550
Petroleum products	1.83	19.29	24869	2353	1.3	-29271
Total	51.95	48.06	66983	61961		1553409

Note: Counterfactual value of exports is computed by applying the relative shares in 1996-97.

In this connection, it may be mentioned that a detailed study of India's exports undertaken by Veeramani (2007) reveals that the share of technology intensive commodities in total exports has increased from 12.1 per cent in 1990-94 to 15.5 per cent in 2000-03 and that for human-capital-intensive commodities has increased from 12.1 to 20.7 per cent in this period. By contrast, the share of unskilled labour-intensive commodities has gone down from 31.1 to 27.3 per cent in the same period. These results are in line with the analysis presented above. There is thus some justification for the

argument that the changing commodity composition of India's exports has significantly adversely affected employment in Indian manufacturing.

Turning next to the commodity pattern of imports of manufactures (shown in Table 8), one important change that may be noticed is the fall in imports of project goods (mostly machinery and equipment). Another notable change is the increase in imports of electronics goods. The share of electronic goods out of the total imports of manufactured

Table 8: Composition of India's Import of Manufactured Products
(Relative shares, per cent)

Product	1996-97	1997-98	1998-99	2005-06	2006-07 R	2007-08 P
Edible oils	3.80	3.13	7.72	2.89	2.42	2.20
Sugar	0.00	0.53	1.13	0.21	0.00	0.00
Fertilizers manufactured	3.15	3.56	3.47	2.39	3.07	3.94
Paper, paper boards, manufactures	2.29	2.12	1.99	1.35	1.38	1.23
Pulp and waste paper	1.07	1.20	1.01	0.82	0.73	0.66
Non-ferrous metals	5.09	3.88	2.56	2.63	2.99	3.00
Iron and steel	6.31	5.99	4.55	6.52	7.37	7.47
Manufactures of metals	1.46	1.37	1.63	1.73	1.84	2.29
Machinery except electrical and electronic	19.18	15.26	13.02	14.28	15.88	16.92
Electrical machinery except electronic	1.50	1.59	1.80	2.15	2.25	2.57
Electronic goods	6.55	8.79	9.51	18.89	18.31	17.49
Computer goods	0.39	0.72	0.70	1.29	1.11	0.88
Transport equipment	6.83	4.43	3.41	12.61	10.82	7.10
Project goods	9.75	7.33	11.50	1.26	2.06	1.11
Organic and inorganic chemicals	12.24	12.45	11.48	9.96	8.98	8.50
Textile yarn, fabrics, made-ups, etc.	1.65	1.72	1.95	2.93	2.47	2.13
Artificial resins and plastic materials, etc.	3.66	2.92	2.89	3.24	2.96	3.17
Professional, scientific controlling instruments, photographic optical goods	2.54	3.14	3.51	2.81	2.68	2.63
Medicinal and pharmaceutical	1.41	1.64	1.64	1.47	1.49	1.43
Chemical materials and products	1.21	1.26	1.67	1.50	1.52	1.40
Non-metallic mineral manufactures	0.56	0.58	0.69	0.89	0.89	0.90
Petroleum products	9.37	16.40	12.19	8.20	8.79	12.99
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Reserve Bank of India: *Handbook of Statistics on Indian Economy*.

products has increased from 6.55 per cent in 1996-97 to 17.5 per cent in 2007-08. An increase in the share in imports is noticed also for transport equipment, and iron and steel,

and a decrease is noticed for organic and inorganic chemicals. From the changes in the commodity composition of India's imports it is difficult to say if this had a significant adverse effect on employment in manufacturing.

Liberalization of imports in India, particularly the removal of quantitative restrictions on imports of about 1400 consumer goods items in 2000 and 2001 have led to increases in imports. In certain cases, the increases have been quite large and this may have adversely affected the employment in those industries. Attention may be drawn here to the list of 300 sensitive items whose imports are being monitored by the government. Out of this list, imports of items of interest to small-scale industries (37 tariff lines, covering among others umbrella, locks, toys, writing instruments, tiles and glassware) have increased sharply in recent years. The value of imports of such items increased from US$42 million in 2002-03 to US$ 175 million in 2006-07. This sharp increase in imports has probably adversely affected the employment in domestic units producing such items. Due to lack of data, it is not possible to investigate this issue adequately.

2.3.2 Direction of Trade

In the post-reform era, India's trade with Eastern European countries, EU, Japan and USA relative to India's total trade has come down, while that with China and some of the other important developing countries has increased (Table 9). Indeed, China has emerged as a leading trade partner of India in the last ten years or so. Between the triennium ending 1996 and the triennium ending 2007, the share of EU, Japan and USA in India's exports declined from about 52 per cent to about 38 per cent. In this period, the share of China in India's exports increased from 1.3 per cent to 6.7 per cent. Similarly, there has been a fall in the share of EU, Japan and USA in India's imports between the trienniums ending 1996 and 2007, from 43 to 24 per cent, which has been accompanied by an increase in the share of China in India's imports, from 2.2 to 9.6 per cent.

Table 9: Country-wise distribution of Indian exports and imports, trienniums ending 1996, 2001, and 2007 (Relative share, per cent)

Country	Exports			Imports		
	TE 1996	TE 2001	TE 2007	TE 1996	TE 2001	TE 2007
EU	26.63	23.67	20.68	26.84	21.05	15.08
U.S.A.	18.67	20.94	14.65	10.01	6.42	5.99
Australia	1.21	0.98	0.75	3.12	2.28	3.44
Japan	6.82	3.99	2.30	6.41	4.30	2.61
Indonesia	1.67	1.01	1.41	1.32	1.92	2.09
Saudi Arabia	1.63	1.91	2.05	6.09	2.71	5.99
U.A.E.	4.55	5.73	9.26	4.67	2.58	4.61
Other OPEC members	1.68	2.51	3.26	10.74	5.01	12.27
Eastern Europe	3.82	3.09	2.03	3.58	1.84	2.45
Bangladesh	2.80	2.06	1.50	0.18	0.14	0.11
Sri Lanka	1.36	1.41	1.80	0.11	0.10	0.29
China, People's Republic of	1.31	1.85	6.65	2.23	3.18	9.64
Hong Kong	5.68	6.00	3.98	0.95	1.58	1.29
South Korea	1.42	1.12	1.85	2.24	2.18	2.68
Malaysia	1.32	1.46	1.28	2.39	2.86	2.39
Singapore	2.89	2.01	4.72	2.92	2.84	2.95
Thailand	1.45	1.29	1.11	0.52	0.72	0.92
Africa	4.16	4.61	6.85	3.32	5.37	3.81
Latin American countries	1.36	2.12	3.19	1.84	1.75	2.52
Others	9.57	12.24	10.66	10.52	31.19	18.88
Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Reserve Bank of India: *Handbook of Statistics on Indian Economy.*

The declining importance of EU, Japan and USA as India's trade partners since the mid-1990s and the rising importance of China in this period appears to have had an adverse effect on employment generation in Indian manufacturing. The reason is that labour-intensive products have a relatively much greater weight in India's exports to EU, Japan and USA, than in India's exports to China. Table 10 presents data on India's exports and imports to China, Germany, Japan, UK and USA in 2007-08 for a number of 2-digit HS codes which contain labour-intensive products. The data given in the table clearly indicates that India's exports to China are much less labour-intensive than India's exports to the other four countries.

Table 10: India's Trade with China, Germany, Japan, UK and USA, Select Chapters, 2007-08 (US$ million)

HS code	Description	India's exports to China	India's imports from China	India's exports to Japan, Germany, UK and USA	India's imports from Japan, Germany, UK and USA
42	Articles of leather, saddlery and harness; travel goods, handbags and similar cont. articles of animal gut (other than silk-wrm gut)	1.94	48.41	631.23	5.28
50	Silk	3.46	34.57	148.16	0.86
51	Wool, fine or coarse animal hair, horsehair yarn and woven fabric	4.69	382.64	29.29	22.1
52	Cotton	1081	29.31	252.06	93.52
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	5.2	40.13	44.63	0.82
57	Carpets and other textile floor coverings	0.74	4.74	757.66	16.96
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use	1.35	264.33	24.15	28.66
60	Knitted or crocheted fabrics	0.03	71.47	30.89	5.59
61	Articles of apparel and clothing accessories, knitted or crocheted	1.01	13.66	2199.07	6.01
62	Articles of apparel and clothing accessories, not knitted or crocheted	3.55	19.59	2800.1	8.56
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags	0.99	36.74	1416.96	12.58
64	Footwear, gaiters and the like; parts of such articles.	2.27	87.6	630.08	8.69
69	Ceramic products	3.04	258.64	27.95	69.33
70	Glass and glassware	29.48	146.28	60.71	87.03
71	Natural or cultured pearls, precious or semiprecious stones, precious metals, clad with precious metal and artcls thereof; imitation jewelry; coin	34.97	341.15	5891.15	2808.66
82	Tools implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.	4.37	47.93	172.31	236.72
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishing; lamps and lighting fittings not elsewhere specified or inc	0.85	264.07	232.22	74.62
95	Toys, games and sports requisites; parts and accessories thereof	0.58	112.03	63.28	27.81
	Total of above categories (A)	1179.52	2203.29	15411.90	3513.80
	Total exports/imports of India to/from respective countries (B)	10656.6	26490.0	34944.6	40821.23
	A% B	11%	8%	44%	9%

2.4 Impact of Trade on Employment – Organized Manufacturing Sector

To gain an understanding of the effect of trade on employment generation in the organized manufacturing sector, a decomposition analysis of employment change during the period 1998-99 to 2003-04 has been carried out using the scheme of decomposition explained in Section 2.1. The period, 1998-99 to 2003-04 has been chosen for the analysis because this is latest period for which ASI data are available with unchanged industrial classification. Also, Input-Output tables are available for 1998-99 and 2003-04 so that data on exports and imports for various product categories matching with ASI data could readily be obtained from those tables.

For the decomposition analysis, data on employment and gross value of output have been taken at the two-digit industry level (NIC-1998). Data on exports and imports taken from the Input-Output tables have been matched with output and employment data at the two-digit industry level. Data on output have been deflated by the wholesale price index for the relevant product category (taking the best available index from the official series). The deflator used for the output of a two-digit industry has been applied also to the exports and imports data for products of that industry (as no other suitable price index for exports and imports are readily available). The estimates for two-digit industries have been aggregated into nine groups and the final analysis has been undertaken at the level of nine groups.

The data on exports and imports taken from the Input-Output tables do not provide a break-up into organized and unorganized sectors. For carrying out the decomposition analysis for the organized sector, trade data are needed separately for the organized sector. From a CMIE publication (*Corporate Sector*), the ratio of exports to sales was computed for various groups of industries. These ratios were then applied to the output of organized sector industries to get an estimate of their exports. In certain cases, the estimate of exports of the organized sector was found to be higher than the total exports of the product category. In such cases, the estimate was taken to be equal to the total exports of the product category. In certain other cases, the estimate was found to be

very low in relation to the total exports of the product category. In those cases, the exports of the organized sector was assumed to be at least 25 per cent of the total exports.

As regards imports of products of various two-digit industries, it has been assumed that it competes mostly with the produce of organized sector enterprises. In other words, it is assumed that an increase in imports of a product will mostly displace the produce of organized sector enterprises. While there is certainly a possibility that imported goods may also displace the produce of unorganized sector enterprises, this is probably small and hence has been ignored.

Table 11 presents the results of decomposition analysis. As mentioned above, two-digit industries of ASI have been classified into nine groups.

Table 11: Employment Change in Organized Manufacturing, 1998-99 to 2003-03, Decomposition Analysis ('000 persons)

Group	Change in employment	Effect of domestic demand growth	Effect of export increase	Effect of import increase	Effect of change in labour intensity
Food products, beverages, tobacco products	-24.1	239.4	89.8	-13.1	-340.2
Textiles and leather products	-20.0	262.9	58.3	-72.4	-268.8
Wood & products, paper & products, printing	-3.0	-49.2	96.4	39.7	-89.9
Chemicals, refineries, rubber and plastic products	-53.5	279.3	84.6	21.0	-438.4
Non-metallic mineral products	15.5	151.9	-22.6	49.9	-163.8
Basic metals	-90.5	305.9	75.3	-88.4	-383.3
Metal products, machinery	-442.0	411.4	82.9	-94.5	-841.9
Transport equipment	-115.2	540.7	46.3	-69.9	-632.2
Other manufactured products	10.9	810.5	53.4	-710.0	-143.0
Total	-721.9	2952.7	564.5	-937.6	-3301.5

It is seen from the table that between 1998-99 and 2003-04, employment in organized manufacturing declined by about 0.7 million. The largest decreases were in Basic metals, Metal products and Machinery and Transport equipment groups. Domestic demand expansion had a strong favourable effect on employment. In the absence of other

changes, domestic demand expansion would have led to an increase in employment by about 3.0 million. But, the fall in labour intensity caused a decline in employment by about 3.3 million. This negative effect was stronger than the positive effect of domestic demand expansion and the net effect was negative.

Table 11 shows that the increase in exports had a positive effect on employment, which was relatively higher for Food products, beverages and tobacco products group, Wood, paper and printing group, Chemicals, refinery, rubber and plastic products group, and Metal products and machinery group. The increases in imports, on the other hand, had a negative effect particularly for the 'others' product group which includes furniture, and watches and clocks. At the aggregate level, the effect of export expansion offset to some extent the negative effect of import increase. The net effect of trade on employment was negative.

To take the decomposition a step further, the change in labour intensity needs to be split into the portion that is attributable to changes in export intensity and import penetration and the portion attributable to other factors. For this purpose, an employment function has been estimated as specified in equation (5) of Section 2.1.

The estimation of the employment function has been done from the three-digit industry-level data for six years, 1998-99 to 2003-04. Data on employment (persons engaged), gross value added, and total emoluments for three-digit industries have been drawn from the ASI (the EPWRF database has been used; EPWRF, 2007). The value added series have been deflated using suitable price indices taken from the Wholesale price index series. The wage rate series for each industry has been deflated by the same price index as the one used for deflating gross value added. Data on exports and imports have been taken from the Input-Output tables for 1998-99 and 2003-04. Data on gross output of different sectors have also been taken from this source. Using data on exports, imports and gross output, export intensity and import penetration ratios have been computed for different sectors of the economy. The figures on imports and exports have been interpolated for the years between 1998-99 and 2003-04 using trade data at the two-

digit HS level taken from *Export Import Data Bank* available at the website of the Department of Commerce, Ministry of Commerce and Industry. The figures on gross output given in the Input-Output table have been interpolated using three-digit level data on gross output reported in the ASI. In this way, the export intensity and import penetration ratio have been computed for various years during 1998-99 and 2003-04 for various input-output sectors belonging to manufacturing. The computed ratios for the input-output sectors have been applied to the constituent three-digit industries.

The estimates of the employment function are presented in Table 12. Regression (1) is based on the ordinary least squares (OLS) technique; regression (2) is based on the random effects model.

Table 12: Estimate of Employment Function, Organized Manufacturing

Dependent variable: log (employment) No. of observations: 347

Explanatory variable	**Regression 1**	**Regression 2**
log(real gross value added)	0.718 (26.1)***	0.109 (6.4)***
log (real wage rate)	-0.817 (-11.3)***	-0.569 (-6.4)***
log (export intensity)	0.093 (2.4)**	0.041 (1.3)
log (import penetration ratio)	-0.081 (-2.0)**	-0.055 (-1.5)
Time	0.003 (0.1)	-0.001 (-0.1)
Constant	-3.597	11.498
R^2	0.71	
Wald Chi-square (5)		89.6
Estimation method	OLS	Random effects

Note: Data for 59 three-digit industries for six years, 1998-99 to 2003-04 have been used for estimating the regression equations.
*** statistically significant at the one per cent level, ** 5 per cent level.

The coefficient of real value added is found to be positive (as expected) and statistically significant. The elasticity of employment with respect to output is about 0.7 in regression (1) and is 0.1 in regression (2) which seems rather low. The coefficient of

real wages is found to be negative (as expected) and statistically significant. The estimated elasticity of employment with respect of wage rate is about 0.8 in regression (1) and about 0.6 in regression (2).

The coefficient of export intensity is found to be positive, while the coefficient of import penetration ratio is found to be negative. The coefficients are statistically significant in regression (1), but not in regression (2). The t-values are, however, more than one, and it seems it would not be inappropriate to infer a positive impact of export intensity and a negative impact of import penetration on employment.

The estimates of elasticity of employment with respect to export intensity and import penetration ratio obtained in regression (1) has been used the split the change in labour intensity as discussed above and incorporate that into the decomposition analysis. The results are shown in Table 13.

Table 13: Employment Change in Organized Manufacturing, 1998-99 to 2003-03, Decomposition Incorporating the Effect of Trade ('000 persons)

Change in employment		**-721.9**
Effect of domestic demand growth		**2952.7**
Effect of export increase		
- demand effect	564.5	
- labour intensity effect	527.5	
- total effect		**1092.0**
Effect of import increase		
- demand effect	-937.6	
- labour intensity effect	-71.3	
- total effect		**-1008.9**
Effect of Change in labour intensity due to factors other than changes in trade intensity		**-3757.7**

The results presented in Table 13 reveal that the effect of export expansion on industrial employment through its impact on labour intensity was almost as large as the demand effect of export expansion. The combined effect was increased employment

opportunity to about 1.0 million persons. This effect was neutralized by increases in imports. The net effect of trade on employment was marginal, the positive effect of exports being cancelled by the negative effects of imports.

Another point that needs to be noted from Table 13 is that changes in labour intensity due to factors other than change in the level of trade tended to reduce employment by about 3.8 million persons. This is traceable primarily to factor substitution and technological change, which in turn may be traced among other factors to changes in the price of labour input in relation to the user cost of capital. In this context, it may be pointed out that the movements in the relative prices of labour and capital inputs in the period 1995 to 2005 have been quite different from that in the period 1985 to 1995 (Figs 6 and 7). In the former period, the prices of labour and capital inputs rose by similar proportions and hence the relative price remained stagnant, but in the latter period, the price of labour increased while the price of capital input did not rise which led to a rise in the relative price of labour. Such movements in relative prices must have had an adverse effect on employment in the period after 1995.

Fig. 6: Price of labour and capital input, 1985-95, organized manufacturing (base, 1985=1.0)

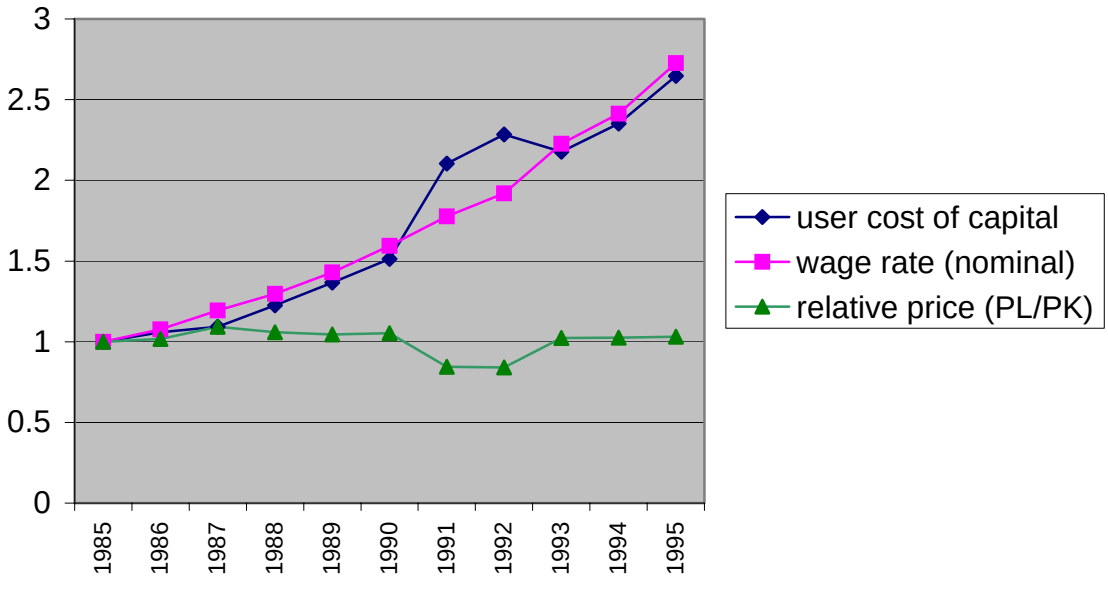
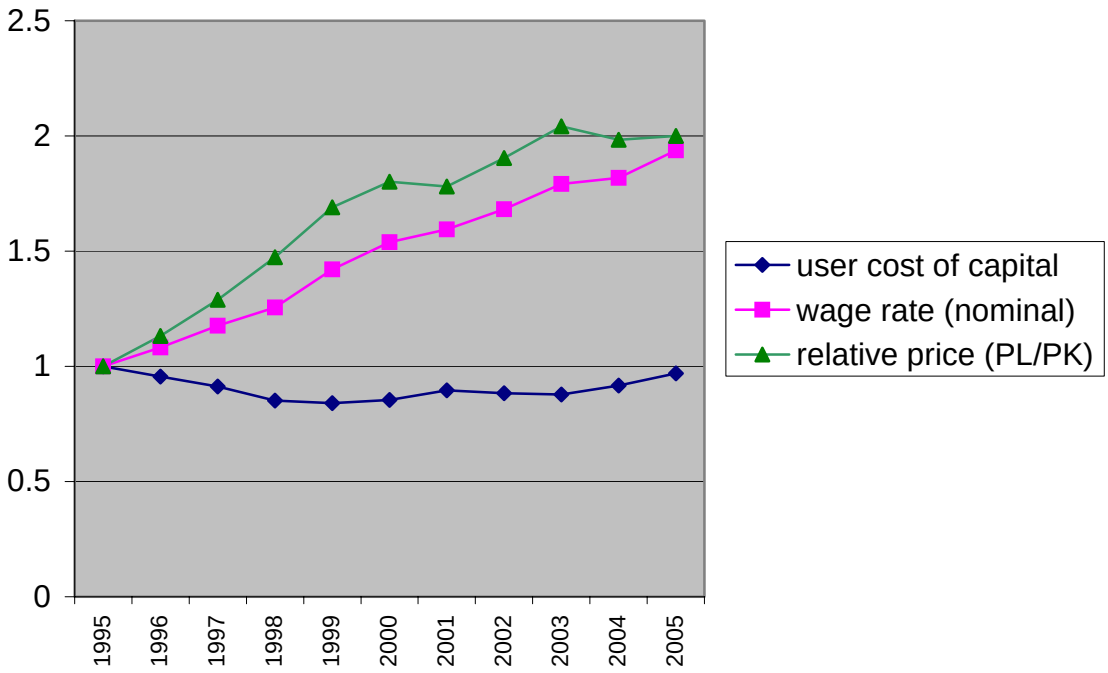


Fig. 7: Price of labour and capital input, 1995-2005, organized manufacturing (base 1995=1.0)



2.5 Impact of Trade on Employment – Unorganized Manufacturing Sector

Due to data gaps, it is not possible to carry out for unorganized manufacturing a decomposition analysis similar to that undertaken for the organized sector above. It is, however, possible to provide some indication of the effect that trade had on the employment in unorganized manufacturing, and this is attempted in this section.

Towards this end, first, a decomposition of employment growth into output growth and labour intensity growth has been undertaken. This is presented in Table 14. Then, some estimates of employment function parameters for unorganized manufacturing are presented. Finally, results of some econometric exercise are presented which aim at relating inter-temporal variation in real output of unorganized manufacturing to trade.

Table 14: Employment Change in Unorganized Manufacturing, 1999-99 to 2004-05, Decomposition Analysis ('000 persons)

Group	Change in employment	Effect of output growth	Effect of change in labour intensity
Food products, beverages, tobacco products	3178	3593	-415
Textiles and leather products	3807	2229	1578
Wood & products, paper & products, printing	25	-105	130
Chemicals, refineries, rubber and plastic products	544	363	181
Non-metallic mineral products	-8	1514	-1522
Basic metals	14	41	-27
Metal products, machinery	870	1429	-559
Transport equipment	85	73	12
Other manufactured products	729	2372	-1643
Total	9244	11509	-2265

Table 14 shows that between 1999-99 and 2004-05, employment in unorganized manufacturing increased by about 9.2 million. The largest part of this increase took place in food products, beverages and tobacco products group and textiles and leather products group. These two groups accounted for about 7 million out of the 9.2 million increase in employment.

Growth in production accounted for the much of the increase that took place in employment. The impact of change in labour intensity was relatively small. In the non-metallic mineral products group, the fall in labour intensity neutralized completely the favourable effect of production growth on employment. In textiles and leather products, on the other hand, there was an increase in labour intensity, which combined with production increase led to additional employment of about 3.8 million persons between 1999-00 and 2004-05.

Table 15 presents estimates of employment function parameters including the elasticity of employment with respect to exports and import intensity. These have been taken from a recent study undertaken by Bathla, Sharma and Banga (2008). They have used unit level cross-section data for the year 2005-06. A comparison of the elasticity estimates of Bathla, Sharma and Banga is made with the estimates obtained for organized industry in this study.

Table 15: Estimated Employment Function Parameters, Organized vs. Unorganized Sector

Explanatory variable	**Estimated elasticity for organized sector**	**Estimated elasticity for unorganized sector (estimated made by Bathla, et al., 2008)**
Gross value added	0.718 (26.1)***	0.464 (75.2)***
Wage rate	-0.817 (-11.3)***	-0.246 (-31.8)***
Export intensity	0.093 (2.4)**	0.040 (2.8)***
Import penetration/import intensity	-0.081 (-2.0)**	-0.013 (-0.9)

Note: *** statistically significant at the one per cent level, ** 5 per cent level.

It may be noticed from Table 15 that the estimated employment elasticities with respect to output and wage rate obtained for the unorganized manufacturing sector have the correct sign and are of plausible magnitude. The elasticities are found to be smaller in numerical value than the elasticities obtained for the organized sector. This suggests that employment in unorganized manufacturing is less sensitive to output and wage changes than employment in the organized manufacturing. Especially, the effect of wage on employment seems to be much higher in the organized industry than in the unorganized industry.

As regards the trade variables, the estimated elasticities for unorganized manufacturing have the same sign as those obtained for organized manufacturing. The finding of a significant positive coefficient for the export intensity variable indicates that an increase in the export orientation of the industry tends to raise the labour intensity of

the firms belonging to the industry. It is important to note that a positive relationship between export intensity and employment is found for both organized and unorganized industry.

To study the effect of trade on the growth of output of unorganized manufacturing, the following model has been estimated:

$$\ln Q_{it} = \alpha_i + \beta \ln GDP_t + \gamma \ln XI_{it} + \delta \ln MPR_{it} + \mu t + \xi_{it} \quad \ldots(6)$$

In this equation, Q denotes real output (deflated gross value of output), XI export intensity, and MPR import penetration ratio. The subscript i is for industry and t for time (year). GDP denotes the real gross domestic product at factor cost for the economy as a whole, which is expected to capture the effect of growing domestic demand. The estimated equations are presented in Table 16. Data for various two-digit industries of unorganized manufacturing for the period 1999-00 to 2004-05 has been used for the analysis.

Table 16: Impact of Exports and Imports on Real Output of Unorganized Manufacturing , Regression Results

Dependent variable : ln(real output) No. of observations = 106

Explanatory variable	**Estimates of the Model**	
	Fixed effects	Random effects
ln(real GDP)	1.96 (2.03)**	1.75 (1.67)*
ln(export intensity)	0.057 (2.34)**	0.068 (2.58)***
ln(import penetration)	-0.139 (-4.38)***	-0.100(-3.02)***
Time	-0.066 (-1.19)	-0.053(-0.88)
Constant	114.7	91.81
Wald chi-square (4)		52.4
F-test (4,84)	16.97	

Note: *** statistically significant at the one per cent level, ** 5 per cent level, * 10 per cent level.

The estimates of the model clearly indicate a positive effect of exports and a negative effect of imports on the output of unorganized manufacturing. Going by the estimates, a one per cent increase in export intensity raises output by about 0.06 to 0.07 per cent whereas a one per cent increase in import penetration reduces output by about 0.1 to 0.14 per cent. Combining the results of Tables 15 and 16, the direct and indirect effects on export intensity and import penetration can be computed. These computations indicate that a one per cent increase in export intensity will lead to about 0.7 percent increase in employment in unorganized manufacturing, while a one per cent increase in import penetration will lead to a fall in employment in unorganized manufacturing by about 0.6-0.7 per cent.

2.6 Recent Experience and Firm-level Analysis

It has been noted in Section 2.2 above that there was a downward trend in employment in organized manufacturing since 1995-96. According to ASI data, between 1995-96 and 2003-04, employment in organized manufacturing declined by about 2 per cent per annum. In 2004-05, there was an increase in employment in organized manufacturing by about 6.3 per cent, and in 2005-06 there was a further increase by about 7.6 per cent. ASI data are not available for more recent years. However, some information about employment in manufacturing companies in recent years could be obtained from *CAPITALINE PLUS* (see www.capitaline.com). Though *CAPITALINE PLUS* (hereafter, CAPITALINE) contains information for about 20,000 companies, only a fraction of them have reported the number of persons employed. Such information for the last three years or more could be obtained for about 625 manufacturing companies. The growth rate in employment computed on the basis of this information is reported in Table 17. Besides these estimates two other sets of estimates of employment growth based on company-level information are presented in Table 17. One of them has been made using data on employee cost reported in CAPITALINE. First, the data on employment and employee cost have been used to compute the average wage rate for different years between 2001-02 to 2007-08. Then, using the wage rate, the data on employee cost has been converted

into an estimate of employment. This could be done for 887 companies. The employment estimates so obtained have been used to compute employment growth rates.[22]

Table 17: Growth in Employment in Organized Manufacturing Firms

Year	**Growth rate in Employment over previous year (%)**			
	Based on ASI	Based on company level information		
		A	B	C
1999-00	-4.9			
2000-01	-2.1			
2001-02	-3.3			-1.2
2002-03	2.5		-2.4	-3.1
2003-04	-1.0	-6.2	-9.6	0.0
2004-05	6.3	1.7	-4.2	0.2
2005-06	7.6	1.7	7.3	2.1
2006-07		4.0	11.7	6.0
2007-08		4.0	5.4	11.9

Note: The three sets of estimates based on company-level information have been worked out in the following way. Cols. (A) and (B) are based on CAPITALINE data. Col. (A) uses data on the number of employees in manufacturing companies, in respect of those manufacturing companies that have reported such data (623 firms). Col. (B) is based on estimated employment in manufacturing companies (as explained in text). The companies for which employee cost could be obtained from CAPITALINE have been covered in these estimates (887 companies). Col. (C) is based on growth in wages and salaries reported in the CMIE publication, *Corporate Sector*, February 2008, covering about 4000 companies for each year during 2001-02 to 2006-07. More recent information on the growth in salaries and wages in manufacturing companies has been taken a monthly publication of the CMIE (*Monthly Review of the Indian Economy*). The wage bill has been deflated by the wage rate computed from ASI as explained in the text. Computation of wage rate could be done for the period 1998-99 to 2005-06; for 2006-07 and 2007-08 a forecast of wage rate has been made using an econometric model.

A third set of estimates of employment growth has been made using estimates of growth in wages and salaries in the corporate sector provided in a publication of the CMIE (Centre for Monitoring Indian Economy Pvt. Ltd) entitled *Corporate Sector* (February 2008 issue used). The information on the growth rate in wages and salaries has been used to form a consistent time-series estimate of wages and salaries paid by

[22] Data for the companies are not available for all years during 2001-02 to 2007-08. Thus, to compute growth rates, a two-year rolling set of consistent companies is considered. For each pair of consecutive years, all manufacturing companies that have reported employee cost for both years are considered.

corporate sector firms belonging to manufacturing. This is divided by the wage rate computed from the ASI to form an estimate of employment. The wage rate could be computed from the ASI for the years 1998-99 to 2005-06. An econometric model has been estimated to forecast the wage rate for 2006-07 and 2007-08 (see Annex).[23]

From the estimates of employment growth presented in the table, it is seen that there was an increase in the growth rate of employment in organized manufacturing in the period after 2003-04. Going by ASI data, the average growth rate in employment in 2004-05 and 2005-06 was about 7 per cent per annum. Company-level information indicate that the average growth rate in employment in 2006-07 and 2007-08 was not less than that in 2004-05 and 2005-06. It seems therefore that the average growth rate in employment in organized manufacturing (particularly the corporate sector organized manufacturing) in the years 2004-05 through 2007-08 was about 7 per cent per annum (or higher).[24]

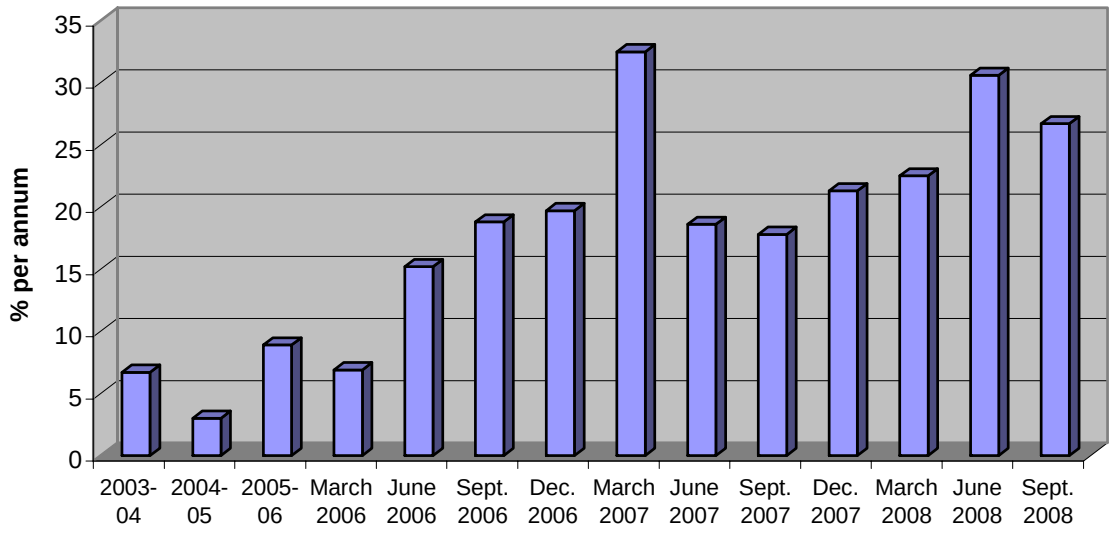
Some additional evidence is presented next in support of the assertion that the average growth rate in employment in organized manufacturing in the years 2004-05 through 2007-08 was around 7 per cent per annum or higher. Figure 8 shows growth rates in Salaries and Wages paid by the Indian manufacturing companies in the years 2003-04 to 2005-06 and in various quarters in the subsequent period. It is evident that there was a marked acceleration in the growth rate of salaries and wages in the period since June 2006. In all the quarters (for which data are available) since June 2006, the

[23] At the time this analysis of employment growth in corporate manufacturing was done, the *Corporate Sector* Report of the CMIE dated February 2009 was not available. According to the 2009 *Corporate Sector* Report (page 30), the growth rate in wages and salaries in corporate manufacturing was 19.1 per cent in 2006-07 and 19.5 per cent in 2007-08. After adjusting for growth in wage rate (based on ASI, see annex), this translates into an average employment growth rate of about 10 per cent for the two years.

[24] Data are not available to make a similar assessment of growth rate in employment in unorganized manufacturing in recent years. It may be pointed out here that employment in unorganized manufacturing grew at a rate of about 5 per cent per annum (or higher) between 1999-00 and 2004-05. Since organized sector employment has accelerated after 2003-04 and there is a positive relationship between employment in organized and unorganized manufacturing (as indicated by a significant positive correlation between formal sector and informal sector employment in manufacturing across states), the growth rate in employment in unorganized manufacturing was probably around or in excess of 5 per cent per annum after 2005-06. Data on employment in micro and small enterprises reported by the Office of the Development Commissioner, Micro, Small and Medium Scale Enterprises, indicate that employment in such enterprises grew at the rate of about 4.5 per cent per annum between 1998-99 and 2003-04. The growth rate in employment between 2003-04 and 2006-07 was about 4.4 percent per annum.

growth rate of salaries and wages was more than 15 per cent per annum, in some cases exceeding 25 per cent per annum. The growth rate in compensation paid per employee was less than 10 percent per annum in the years 2006-07 and 2007-08 (as indicated by the CAPITALINE data). It seems therefore that there was acceleration in employment growth in the corporate manufacturing sector in the period June 2006 to September 2008 compared to the previous three years.

Fig. 8: Growth rate in Salaries and Wages, Indian Manufacturing Companies



Source: Based on data drawn from CMIE publications, *Corporate Sector* (February 2008) and *Monthly Review of the Indian Economy* (various issues).

Econometric analysis of the Impact of Trade

Using CAPITALINE data for the years 1998-99 to 2007-08, an econometric analysis of the impact of trade on employment in industrial firms has been undertaken. To assess the impact, an employment function has been estimated using panel data on companies.

As mentioned earlier, CAPITALINE data on employee cost and actual employment available for a subset of companies have been used to obtain the average

wage rate for different years. This could be done for the years 2001-02 to 2007-08. A trend line has been fitted to these data on wages to make an estimate of the wage rate for previous years (going up to 1998-99). Having obtained the wage rate for different years, the reported employee cost has been divided by the wage rate to get an estimate of employment in different companies in different years.

The logarithm of employment is taken as the dependent variable of the estimated regression equation, in which a number of trade-related variables have been included. Four other variables included in the equation are as follows: real sales (to capture the effect of output growth), technology orientation (based on R&D and technology purchase, aimed at capturing the effect of technology acquisition on employment growth), advertisement intensity and time (year). By including advertisement intensity in the equation, the purpose is to incorporate in the model the nature of the product(s) produced by the firm, since advertisement intensity is expected to be relatively higher for consumer goods. Time variable captures the effect of those excluded variables that moved with time, say changing technology of production, and relative factor prices. The estimated regression equation, estimated by the random effects model, is shown in Table 18.

The results show a significant positive effect of sales (representing firm output) on employment. A positive effect of output on employment is obviously expected. It is interesting to note that the estimated elasticity is 0.7 which matches very well with the estimated elasticity for the organized sector obtained on the basis of industry-level panel data (see Table 12). The coefficient of advertisement intensity is positive and significant. This possibly means that other things remaining the same, employment tends to be higher in a consumer goods industry compared to a capital goods or an intermediate goods industry. The coefficient of the technology orientation variable is found to be negative and statistically significant. It may be inferred that other things remaining the same, a firm incurring greater expenditure on technology acquisition would have less employment. The coefficients of the three import-related variables — imports of capital goods, imports of raw materials and imports of finished goods — are all negative and

statistically significant. This shows that high import orientation tends to reduce employment in the firms. It should be noted that this variable is different from the import variable used in the regression results based on industry-level data. There, the import penetration variable reflected the import competition faced by industrial firms, whereas the import variables in the firm-level regression reflect the imported inputs used by the firms.

Table 18: Factors Influencing Employment in Industrial Firms, Estimated Model

Dependent Variable: log(employment)
Estimation method: Random effects No. of observations: 6629

Explanatory variable	Coefficient (t-ratio)
log (deflated net sales)	0.698 (90.6)***
Export intensity (exports to sales ratio)	-0.086 (-2.0)**
Technology orientation (expenditure on R&D plus payments towards royalty and technical fees as a ratio to sales)	-0.012 (-3.0)***
Capital good import intensity (imports of capital goods as a ratio to sales)	-0.012 (-1.8)*
Raw materials import intensity (imports of raw materials as a ratio to sales)	-0.202 (-4.0)***
Finished goods import intensity (Imports of finished goods as a ratio to sales)	-0.454 (-3.2)***
Advertisement intensity (expenditure on advertisement and selling expenses as a ratio to sales)	0.599 (11.8)***
Time	-0.111 (83.2)***
Wald Chi-square (8)	11292.1

Note: Data for 1280 manufacturing Companies used; period: 1998-99 to 2007-08
*** statistically significant at the one per cent level, ** 5 per cent level, * 10 per cent level.

The coefficient of the export orientation variable is negative and statistically significant at the 5 per cent level. This result is at variance with the result obtained from industry-level data. This difference in the results may be reconciled in two ways. First, an increased export orientation in an industry may be associated with increased production of certain relatively more labour-intensive items of production (it may also involve entry

of new firms producing those items). In a sense therefore, greater export orientation is associated with changing product mix, which can more easily happen at the industry level than at the level of a specific firm. A second interpretation is that the impact of increased export orientation on employment in industrial firms depends on the size of the firm. The effect may be positive for relatively small firms, and negative for relatively bigger firms. Since CAPITALINE data cover only corporate sector firms which are relatively big in size as compared to the coverage under ASI, the observed effect may be positive in one dataset and negative in another.

3 Contract Labour in Organized Manufacturing

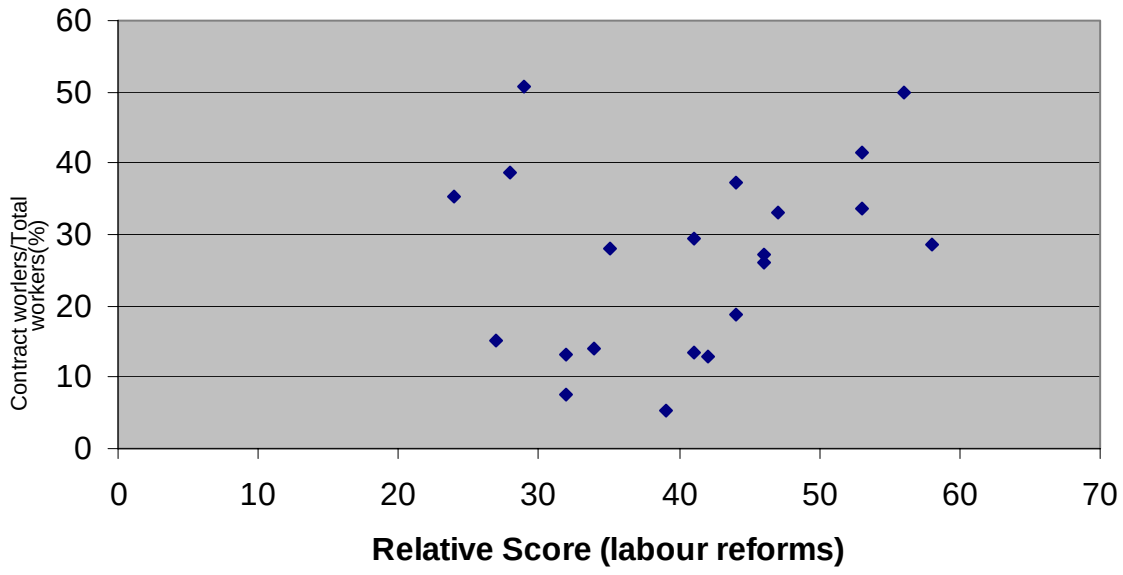
The analysis presented so far has focused on the quantity of employment generation rather than quality. The latter aspect is taken up for analysis next by looking into the employment of contract labour in organized sector enterprises.

It has been mentioned earlier that the proportion of workers employed through contractors has been growing over time. It has increased from 13.9 per cent in 1995-96 to 19.7 per cent in 1999-00 and further to 26.4 per cent in 2004-05. The proportion varies significantly across states and industries. Among states, the proportion of contract labour is relatively high in Andhra Pradesh, Bihar, Chattisgarh, Goa, Haryana, and Orissa, mostly in the range of 35 to 50 per cent. However, for specific three-digit industries, the proportion in one or more of these states reaches over 80 per cent. Among industries, the use of contract labour is relatively greater in beverages, tobacco products, chemicals and chemical products, non-metallic mineral products, basic metals, metal products, non-electrical machinery and transport equipment. There has been an almost across-the-board increase in the use of contract labour both among industries and among states.

The use of contract labour by industrial enterprises is commonly viewed as a method of circumventing the labour laws. There is an impression that by undertaking labour market reforms, it may be possible to contain the use of contract labour in industrial enterprises thereby improving the quality of employment. A state-wise

comparison of the labour market reforms undertaken, based on an index prepared by Dougherty (2008),[25] and the use of contract labour shows that these two are positively correlated (correlation coefficient = 0.25). A graphic presentation is made in Fig. 9.

Fig. 9: Labour reforms and use of contract labour in select states of India



To study the determinants of use of contract labour in industrial firms, particularly the impact of trade, a multiple regression analysis has been carried out using cross-section data for 2004-05. Data on total workers and workers employed through contractors have been taken for the three-digit industries in various states (21 states covered in the study). The ratio of contact workers to total workers is taken as the dependent variable. The model is specified as follows:

[25] This is based on a state-level survey recently undertaken. It covered eight major areas of labour law, identifying 50 specific subjects of possible reform many of which could be implemented by administrative procedure rather than through formal amendments to the laws. The eight areas covered in the index are the Industrial Disputes Act (IDA), Factories Act, State Shops and Commercial Establishments Acts, Contract Labour Act, the role of inspectors, the maintenance of registers, the filing of returns and union representation. Each state is given a score reflecting the extent of reforms undertaken; the maximum possible score is 50 and the average score across states is 21. For the analysis presented here, the relative scores reported by Dougherty are used.

$[CW/TW]_{ij} = f(LRI_j, XI_i, MPR_i, RW_j, FCPF_{ij})$ …(7)

In this equation, $[CW/TW]_{ij}$ is the ratio of contract workers to total workers in industry i state j, LRI_j is the labour market reforms undertaken in state j (index), XI_i is export intensity of industry i, MPR_i is the import penetration ratio in industry i, and $FCPF_{ij}$ is fixed capital per factory in industry i state j. RW_j denotes the ratio of wage rate of contract workers to that of directly employed workers in state j, which is available only at the state level. The equation has been estimated by the OLS technique. The results are reported in Table 19.

Table 19: Factors Influencing Employment of Contract Labour, Estimated Model

Dependent variable: number of workers employed through contractors as a proportion of the total number of workers (industry i in state j) (in 2004-05)

Explanatory variable	**Regression (1)**	**Regression (2)**	**Regression (3)**
Observations used	All	Those with export intensity above average	Those with export intensity below average
Labour reforms index (state j)	0.0027 (4.04)***	0.0027 (3.24)***	0.0028 (2.49)**
Export intensity (industry i)	-0.2168 (-3.26)***	0.091 (0.38)	-0.164 (-2.04)**
Import penetration ratio (industry i)	-0.0149 (-0.29)	-0.114 (-1.07)	0.040 (0.77)
Wage rate of worker employed through contractors as a ratio to the wage rate of directly employed workers (state j)	-0.1268 (-3.18)***	-0.147 (-3.06)***	-0.077 (-1.12)
Fixed capital per factory (industry i in state j)	0.409 (2.58)***	0.569 (2.23)**	0.309 (1.69)*
No. of observations	969	714	255
R^2	0.05	0.03	0.06

Note: Data for three-digit industries for 21 states have been used. The number of industries covered varies from state to state, ranging from 24 to 56.
*** statistically significant at the one percent level, ** 5 percent level, * ten percent level.

Regression (1) uses all the observations for industries and states. In regressions (2) and (3), subsets of the observations have been used. Results of regression (1) indicate a significant positive effect of labour market reforms on use of contract labour. A significant positive relationship is also found between average factory size (represented by fixed capital per factory) and use of contract labour. The coefficient of the relative wage variable is negative and statistically significant which implies that if there is a larger gap between the wage rate of directly employed workers and workers employed through contractors, the use of contract labour will be greater. This is obviously expected.

As regards the trade-related variables, the coefficient of import penetration is negative but not statistically significant. It would appear therefore that competition from imports does not exert a significant influence on the propensity of industrial firms to use contract labour. For the export intensity variable, on the other hand, a significant negative relation is found. There is indication from the results that higher export orientation is associated with lower use of contract labour. This goes somewhat against what one would expect. One may reasonably argue that an export-oriented firm may require greater flexibility in operations and should therefore employ a higher proportion of workers on contract.

To investigate this aspect further, the observations have been divided into two subsets: one in which export intensity is more than average, and the other in which export intensity is less than average. The regression equation has then been estimated separately for the two subsets of observations. The results are reported under regressions (2) and (3) in the table. The export variable is now found to have a positive coefficient for the sub-sample with less than average export intensity and a negative coefficient in the sub-sample with more than average export intensity.

It appears that when export intensity is low, cost and flexibility is important for the industrial firm which gets reflected in the use of contract labour. However, when export intensity crosses a threshold, other consideration become dominant, particularly how best to meet the requirements of the clients. At that stage, loyalty, teamwork,

training, experience, human capital formation become important for meeting the demands of the export market. As a result, a negative relationship arises between export intensity and use of contract labour.

Labour reforms and the use of contract labour

An interesting finding of the analysis presented above is that labour reforms bear a positive relationship with the extent of use of contract labour. To investigate this relationship more closely, correlation coefficients have been computed between the proportion of contract workers (in organized manufacturing) in different states, and labour reforms scores of Dougherty (2008) segregated into different aspects of the reforms. The reforms connected with the Industrial Disputes Act (IDA) are found to bear a negative correlation. The cross-state correlation coefficient is –0.17. On the other hand, the use of contract labour is found to bear a positive correlation with reforms undertaken in respect of (a) inspection of factories, (b) maintenance of registers, and (c) filing of returns.[26] The correlation coefficients obtained for these three aspects of reforms are 0.27, 0.24 and 0.23, respectively.

Several earlier studies have noted that Chapter Vb of the IDA has an adverse effect on employment generation in Indian industries (Fallon and Lucas, 1993; Ahsan and Pagés, 2008). A notable recent study on this aspect is by Ahsan and Pagés (2008) who have made a distinction between IDA amendments relating to employment protection and those relating to resolution of labour disputes. They find that the laws that increase employment protection or the cost of labour disputes substantially reduce employment and output of the registered manufacturing sector. Labur-intensive industries are more affected by the laws that provide employment protection, while capital-intensive industries are more affected by the laws that increase the cost of labour dispute resolution.

[26] The reform measures considered for giving the scores include: single annual inspection, authorization requirement for surprise inspection, common attendance register for different acts, common accident register for different acts, single inspection book, allowing filing of a consolidated form, allowing a single format for various returns, simplification of returns, permitting self-certification, and existence of single window procedures for filing of returns.

Ahsan and Pagés (2008) note that contract labour has become a common way to deal with the problems posed by the labour regulation arising from the Industrial Disputes Act. The use of contract labour is found to have a favourable effect on employment in the econometric analysis undertaken by them. However, from the results obtained, they conclude that contract labor may be more effective at ameliorating the effects of regulations on output than on employment. At the same time, Ahsan and Pagés (2008) point out that while firms hire contract labour as a way to reduce wage and adjustment costs, the fact that contract workers are not covered by industrial dispute laws is probably an additional source of interest for employers.

The relationship between employment growth, labour regulation and use of contract labour is a complex one. The use of contract labour seems to have a favourable effect on employment, partly by encouraging investment by firms and partly by making them adopt a higher labour intensity of production than what they would have done otherwise. The use of contract labour is itself affected by labour regulation. Indeed, going by the arguments (Ahsan and Pagés, 2008) noted above, easing of regulations relating to employment protection and dispute settlement should cause a fall in the use of contract labour. This is borne out by the finding of a negative correlation coefficient (-0.17) between the use of contract labour in various states and the labour reforms score relating to the IDA. What needs to be emphasized here is that other components of labour reforms need not have an adverse effect on the use of contract labour. Rather, they may cause an increased use of contract labour. From the correlation analysis undertaken it is found that easing of inspection requirements and procedures may make the industrial firms employ more, rather than less, contract labour.

4. Summing-up

Employment in organized manufacturing has been falling since 1995. Domestic demand expansion had a strong positive effect on employment, but this was more than neutralized by a decline in labour intensity, which is partly attributable to changes in relative factor prices. Exports had a favourable effect on industrial employment, but the positive effect

of export increase was offset by the negative effect of increases in imports. The net effect of trade on employment in organized manufacturing was marginal. But, there are indications that the failure of trade to raise industrial employment lies primarily in the changing product composition of trade and the changing direction of trade. Petroleum products has emerged a major item of India's exports whereas the traditional labour intensive products have lost their share. As the employment generation potential of petroleum products is a tiny fraction of the figures for traditional export industries such as readymade garments, this trend in the changing composition of the export basket has cost the economy dearly in terms of the employment potential lost. In regard to the destination of trade, the falling importance of EU, Japan, and USA as India's trading partners has had an adverse effect on employment generation in industries.

To make trade a more potent tool for employment generation, the obstacles to the growth of labour intensive export products have to be overcome. This requires India to enter into FTA/PTA with EU/ USA/ Japan as well as addressing the problem posed by non-tariff barriers that constrain the growth of labour-intensive exports from India. The policy initiatives needed to address the problems posed by non-tariff barriers have been discussed at length in a recent study undertaken by the ICRIER[27] and need not be repeated here.[28] These initiatives would probably go a long way in overcoming the problems that small exporting firms face and thus help in attaining a fast rate of employment growth.[29]

The analysis presented above has shown that the unorganized manufacturing sector has experienced in recent years a reasonably high rate of employment growth. The

[27] Convergence towards Regional Integration between the EU and India: Trade Implications for the UK and India, Aberystwyth University and ICRIER, 2008.

[28] Suffice here to note that the elimination of trade barriers will increase effective market access of Indian exporters of labour intensive products such as textiles and leather products to the markets of developed countries. The recommendations made in the ICRIER Report for elimination of non-tariff barriers include information dissemination, simplification of and transparency in regulations and standards, joint accreditation of testing and certification facilities followed by an eventual convergence of the regulatory regimes. Also, there is need for technical assistance and capacity building so that Indian exporting firms can overcome various domestic constraints that exist.

[29] It should be recognized that there are other constraints to the growth of labour intensive industries. These include availability of infrastructure and credit, which have been highlighted in a Report prepared by the ICRIER for the National Manufacturing Competitiveness Council, Government of India (ICRIER, 2008).

econometric results also brought out that higher export intensity leads to higher output growth in unorganized manufacturing as well as higher labour intensity of production. The favourable effect of exports on employment in unorganized manufacturing can thus make a significant contribution to employment generation in the industrial sector. However, non-tariff barriers are a bigger problem for the unorganized sector enterprises than organized sector enterprises. This is so because such enterprises due to their small size may not have the technical capabilities or resources to overcome the problem. It seems therefore that technical and financial support of the government agencies is essential for unorganized sector enterprises to take adequate advantage of the trade opportunities.

Annex: Forecasting Industrial Wage Rate for Recent Years

In a number of studies on Indian industry undertaken at the firm-level, using firm-level databases, for example, the Prowess database of the CMIE, a measure of labour input (number of employees or man-hours) has been formed by dividing the reported employee cost (salaries and wages) by the average wage rate computed from the Annual Survey of Industries (ASI) (see, for example, Basant and Fikkert, 1996). In some cases, the studies have used company-level data for a period beyond the years for which ASI data are available. This gave rise to a problem because the researchers could not compute the average wage rate from ASI for all the years covered in the study (to be used for conversion of salaries and wages reported by the companies into number of employees/man-hours). But, the researchers got around this problem through extrapolation of the wage series. Thus, in several studies, the time series on wage rate computed from the ASI data has been extrapolated to more recent years on the basis of the past trend and the extrapolated figures on wage rate have been used to compute employment from the available company-level data on salaries and wages (see, for example, Sasidharan, 2006 and Saxena, 2007).

In Section 2.6 of the paper, an estimate of employment growth in the Indian organized manufacturing sector has been presented based on the CMIE data on employee cost in the corporate sector, applying a methodology similar to the one used by Basant and Fikkert (1996), Sasidharan (2006), Saxena (2007), and many others (employment growth estimates shown in the last column of Table 17). Unlike the studies of Sasidharan (2006) and Saxena (2007) who have extrapolated the wage rate computed from ASI to obtain the wage rate for more recent years, in this study, an econometric model has been estimated for this purpose, since that should provide a more accurate forecast. The average wage rate in the organized manufacturing sector computed from ASI has been regressed on three variables: Consumer price index for industrial workers (CPI_IW), Growth rate in real GDP in manufacturing (Gr_GDPM), and time (year). Data for the period 1985-86 to 2005-06 have been used for the estimation of the econometric model. The estimated equation is shown below:

$$\ln(\text{wage}) = -52.0 + 0.9 \ln(\text{CPI\_IW}) + 0.27\ \text{Gr\_GDPM} + 0.023\ \text{time}$$
$$\qquad\qquad\qquad\qquad (13.0) \qquad\qquad (1.97) \qquad\qquad (4.27)$$

$R^2 = 0.999$ DW= 2.07 No. of observations =21

Fig. A.1 shows the actual wage rate and that predicted by the model. Evidently, the model fits the data very well. The value of R^2 is 0.999.

To make a comparison of the forecast made on the basis of past trend and that made on the basis of the econometric model, the data for the period 1985-86 to 2002-03 have been used to estimate the trend equation and the econometric model and these have been used to forecast of wage rate for the years 2003-04, 2004-05 and 2005-06 for which actual wage data are available. The comparison is presented in Fig. A.2. It is seen that the econometric model predicts the wage rates for the years 2003-04 to 2005-06 well, while the extrapolated wage rate based on past trend does relatively worse. This brings

out the advantage of using an econometric model for forecasting wage rate over extrapolation based on past trend.

Fig. A.1: Wage rate, actual and predicted

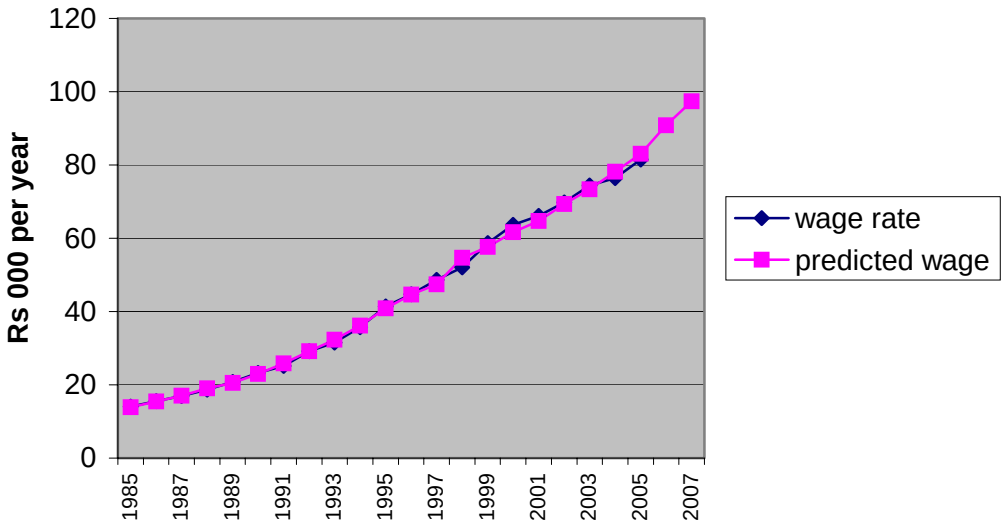
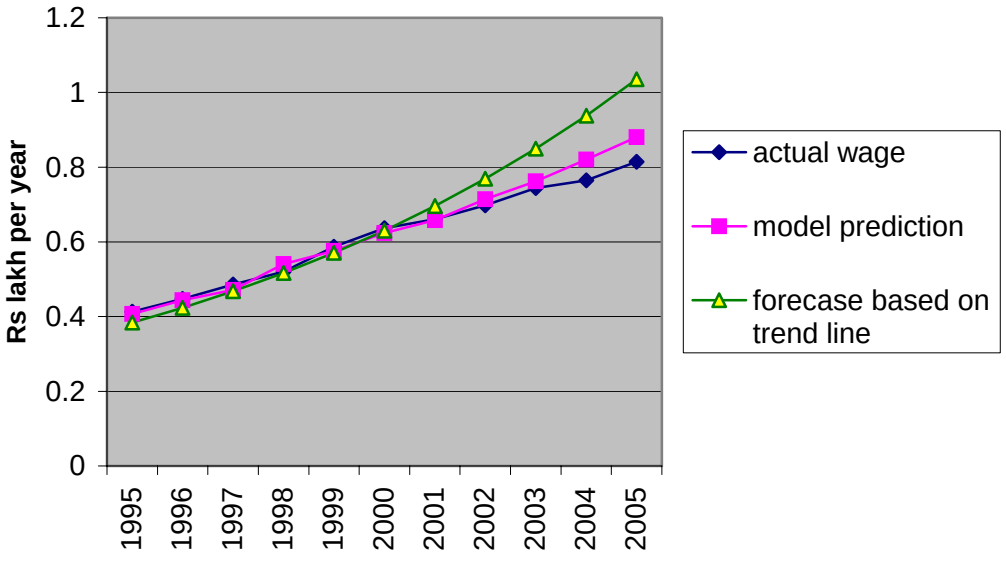


Fig. A.2: Comparison to two forecasts



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