

# **IMPACT OF TRADE LIBERALISATION ON EMPLOYMENT: THE EXPERIENCE OF INDIA'S MANUFACTURING INDUSTRIES**

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## **Abstract**

The Indian economy has entered a phase of high growth in the recent years, after a long period of low growth. Since economic growth itself is not sufficient to achieve economic development, the concern of policy makers seems to have shifted towards making the growth inclusive – a process wherein employment is at its core. The available evidence, however, tends to indicate that the high growth has been accompanied by low employment growth in the organised manufacturing sector. Various reasons have been put forward in the literature to explain the observed jobless growth. This included, but not limited to, labour market rigidity, growth of mandays worked, growth in wage rate and others. But the observed jobless growth has been coincided with an unprecedented increase in the rate of integration of Indian economy with the world market through trade liberalization. Yet, it is surprising to note that the impact of trade liberalisation has not received the attention of scholars that it deserves in explaining the observed jobless growth. Hence, the present study explores the underlying factors behind the poor performance of the organized sector in terms of employment generation in the context of trade liberalization.

## **Introduction**

The Indian economy has entered a phase of high growth in the recent years, after a long period of low growth. However, the period of this growth phase had been its exclusionary nature, with the benefits of the growth being concentrated to a few hands<sup>1</sup> (Pal and Ghosh, 2007). Since economic growth itself is not sufficient to achieve economic development, the concern of policy shifted towards making the growth inclusive as evident from the Eleventh Five Year Plan (2007-12) of the Government of India. For achieving this goal, the scholars have called for, among others, an industrial revolution that complements the services revolution to respond to the challenge of providing gainful employment to its growing workforce (Kumar and Joseph et al., 2006).

After liberalisation the economy had grown at more than 6 percent on the average during the period 1990-2004 (Agarwal, 2008). India's overall employment growth also has considerably increased from one per cent per annum to nearly 3 per cent and industrial employment growth increased from 2.9 per cent to 4.2 per cent, between 1993-94 to 1999-2000 and 1999-2000 to 2004-05 (Unni and Raveendran, 2006 and 2007). However, the worrying fact is that the rise in employment has been mostly within the unorganised and unregulated informal sector particularly in the period after 1996 (Rani and Unni, 2004). In case of organised sector, annual employment growth has decreased from 3.44 per cent per annum during 1990-91 to 1996-97 to -0.63 per cent in 1997-98 to 2004-05. The sector, which can provide secured jobs, employment has increased in the initial period of liberalisation but then reduced is an important issue for research. Kannan and Raveendran (2009) found that registered manufacturing industries performed quite well in terms of output during post-reform period. However, it was not reflected in employment growth. Many scholars analyzed this issue of jobless growth and the reasons advanced by them are varied such as job security regulations, increased wages, increased labour productivity, increased capital intensity etc. (Goldar, 2000, 2002, Nagaraj 2000, 2004 and Kannan and Raveendran, 2009). The important point to note is that, this jobless growth has occurred when India's integration with the rest of the world, with regard to

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<sup>1</sup> "The rapid growth achieved in the past several years demonstrates that we have learnt how to bring about growth, but we have yet to achieve comparable success in inclusiveness" (Singh, 2008 : Forward note to Eleventh Five Year Plan – 2007-12)

trade and investment, has increased after policy shifted towards the open economy. This policy shift will have its own effect on labour market. However, studies examined the issue of 'jobless growth' in the closed economy framework and this issue is not taken in the context of globalisation. With this backdrop, the present paper aims to examine the impact of trade liberalisation in India's organised manufacturing sector employment during post-reform period.

### **Analytical Context and Literature Review**

The basic frame of analysis for the nexus between factor use and trade comes from the Hecksher-Ohlin trade theory. The relatively higher endowments of labour in developing countries than that of industrialized countries provide these economies comparative advantage in the production of labour-intensive goods. Thus, the labour-intensive production relatively expands and capital-intensive production contracts in developing countries; the opposite scenario will occur in industrialized countries. Consequently, in developing countries, the demand for labour rises and that of capital falls. Therefore, theoretically one can say that developing countries are the main beneficiaries under the liberalised trade regime, in terms of employment (Ghose, 2000, Abdi and Edwards, 2002).

Literature shows that there are two direct channels through which trade can affect employment. Hasan, Mitra and Ramaswamy (2003, 2007), Rodrik (1997), Feenstra and Hasan (1996) gave the potential way in which imports, especially import of intermediate inputs or outsourcing, affect employment. Trade liberalisation facilitates the import of larger varieties of inputs and therefore increases the elasticity of substitution of labour with respect to all other inputs. In other words, new imported material and capital inputs can substitute the services of workers, called "substitution effect". Whereas increased exports have a positive effect on the level of output, tending to increase employment (Sen, 2008). This is the second channel called "Scale Effect" which helps to increase employment.

The experience of trade liberalisation in different countries shows varied employment effects. For instance, Onaran (2008) found that in Austrian manufacturing industries, during 1990-2005, employment declined by 1.8 per cent due to increased import penetration. Even in a developed country like US, employment has decreased when it opened up the economy, particularly the trade regime. Studies by Revenga (1992) and Feenstra and Hansan (1996) concluded that increase in import competition or outsourcing has significant effect in terms of decrease in employment in US. Davis and Mishra (2007), however, argued that the effect depends on whether imports are substitutes or complementary to production. If imports are not the substitutes of domestically produced goods but complementary inputs that are being produced domestically then the negative effect will not be observed, and even a positive effect is possible. A study by Revenga (1997) has explored this complementary relationship between import of inputs and employment in Mexico during 1980s. However, a set of studies by Christer, Kupets and Lehmann (2005) and Abdi and Edwards (2002) discovered that trade reform is not a major factor in the determination of employment in Ukraine and South-Africa respectively.

On the other hand, the effect of trade reform on labour market can occur through changes in policies, such as changes in tariff and other trade barriers or trade protection (Revenga 1997). Brander (1981) and LaRoche (2007) explain a route by which changes in tariff affect employment. Their study was based on the basic premise that foreign tariffs and domestic tariffs would have their differential impact on employment. A reduction in domestic tariffs would increase sales of foreign firms in the domestic markets and that of foreign tariffs would increase sales by domestic firms in foreign markets. Employment levels are closely related to sales of the firms. Consequently, falling domestic tariff decreases the sales and would eliminate jobs that were protected earlier. Conversely, changes in foreign tariffs are negatively correlated with employment changes in firms, because opportunities provided by falling tariffs would play an important role in creating new jobs.

In this respect, Gaston and Trefler (1994, 1997) and Beaulieu (2000) found that free trade was directly responsible for a significant job loss in Canadian manufacturing industries that were protected initially by import tariffs. On the contrary, another set of studies found that the impact of trade reform or reduction of tariff barriers does not have significant effect on employment in Mexico and Morocco (Revenga, 1997, Harrison and Hanson, 1999 and Feliciano, 2001). Although the literature on the subject of impact of trade reform on employment is rich with empirical studies of different developing countries, there seems to be no clear consensus on the relationship between trade liberalisation and employment. It can be argued that impact of trade liberalisation on employment is a country specific issue. Therefore, as one of the emerging trade regime, India is an interesting case to study the effect of trade reform on employment.

In India, scholars did not give much attention to this issue. There are limited attempts to address employment issue with trade reforms. In this context, using Annual Survey of Industries and Prowess data for the period 1991-92 to 1997-98 Banga (2005) found that export-orientation of industries have significant positive effect on employment and imports do not have significant effect on employment. Ghose (2000), in his developing countries studies, including India, found that trade increases employment elasticity in manufacturing industries for the period 1981-94. However, he mentioned that, the share of export-oriented industries employment has actually been declining in India, thus, the observed rise in employment elasticity cannot be attributed to export growth and trade did not adversely affect employment growth in import-competing industries.

Another study by Hasan, Mitra and Ramaswamy (2003, 2007), using state level ASI data for the period 1980-1997, found that labour demand elasticities, with respect to wages, increased after the trade reforms particularly in states which are having flexible labour markets. Sen (2008, 2009) investigated the effect of international trade on India's manufacturing industries for the period 1975-1999. Using Generalized Method of Moments, he did not find any significant effect of export orientation and import penetration on employment. Thus, he concluded that international trade may have much less positive impact on manufacturing employment and may not be the major source of

job creation for India's major group of the surplus unskilled labour. Although, the important point to note is that contrary to theoretical expectation, coefficient of exports has a negative and imports have a positive sign. In his recent paper Goldar (2009) analysed for the period 1980-81 to 1997-98 and found that trade liberalisation raises labour demand elasticity. Although the econometric results reported in the paper indicate that trade liberalisation had a positive effect on the labour demand elasticity in Indian industries, the estimated elasticity for the post-reform period is found to be lower than that for the pre-reform period. However, these studies did not explain the phenomenon of decreased employment growth in the organized sector after 1997-98 in the context of trade liberalisation. Particularly, in 1995, World Trade Organisation (WTO) came into existence as a consequence of the Uruguay Round (1986-94) of negotiations, reduced trade barriers, can be considered as a another phase of liberalisation is an important policy change. Hence, a careful empirical investigation is needed for India's manufacturing industries.

## **Data and Method**

### **Data**

The empirical analysis in this study is based on two different data sources. The focus of this paper is on organised manufacturing industries at disaggregated level. The study used published results of the ASI published by Central Statistical Organization (CSO) from 1990-91 to 2004-05. Industries were arranged as per the latest available industry classification (NIC-98) and made comparable through concordance. ASI provides data on the number of workers and on the number employees. In this paper, total employees, including permanent and contract workers, supervisory and managerial staff, has been taken as the measure of employment. For trade related data we utilize Commodity Trade (COMTRADE) provided by United Nations Conference on Trade and Development (UNCTAD). In addition, for tariff related data the paper uses Trade Analysis Information System (TRAINS) published by UNCTAD and Integrated Data Base (IDB) given by World Trade Organization (WTO). These data has made been available at the industry level according to International Standard Industrial Classification Rev. 3 (ISIC Rev.3) which is consistent with NIC-98 classification. In this revision, data available is from

1989 to 2006. Therefore, the study restrict its' analysis from 1990-91 to 2004-05, the last year upto which ASI data is available. For tariff, we used import-weighted tariff of effectively applied rates of protection. UNCTAD provides both exports and imports in US dollar terms. The data comprises of 53 three-digit manufacturing industries consisting of 795 observations for the period 1990-91 to 2004-05.

## Empirical Results

### Trade and Employment: Trends and Patterns

**Table 1: Indicator of India's Manufacturing Employment, Export and Import Performance**

Period	Average Annual Growth Rates		
	Employment	Exports	Imports
1980-81 to 1989-90	-0.39	18.72	8.71
1990-91 to 2004-05	0.70	11.37	12.24
1990-91 to 1996-97	3.44	13.04	17.30
1997-98 to 2004-05	-0.63	15.78	16.19

Source: Annual Survey of Industries, Various Issues, Commodity Trade (COMTRADE) United Nations Conference on Trade and Development (UNCTAD)

Note: Number of Employees includes both workers and employees other than workers.

From Table 1, one could observe the pre- and post-reform period employment and trade situation in India's manufacturing sector. In the pre-reform period, before 1990s, there was a decrease of employment growth by -0.39 percent per annum during 1980-81 to 1989-90. However, during the same period India's exports showed higher growth (18.72 per cent) than import (8.71 per cent). While looking the post reform trend, it shows that increased employment growth of 0.70 per cent per annum during 1990-91 to 2004-05. Unexpectedly, during this period India's export growth has reduced to 11.37 per cent and higher import growth of 12.24 per cent per annum.

Further, when we divided the whole period of liberalisation into two phases it showed different picture. During 1990-91 to 1996-97, there was a steady growth of employment by 3.44 per cent per annum and import growth (17.30 percent) is higher than export growth (13.04 percent). In the later phase of liberalisation, the period from 1997-98 to

2004-05<sup>2</sup> employment growth decreased to -0.63 per cent per annum. Surprisingly, during this period export growth (15.78 percent) is higher than import growth (16.19)<sup>3</sup>. This trend did not support the H-O theory in case of India. However, this aggregate trend is not enough for any conclusion. Therefore, in the following section we have done analysis at the 2-digit industry level.

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<sup>2</sup> We adopted this periodisation, since these two periods follow different employment trend, whereas the first period reveals positive employment growth and the latter shows negative employment growth. In addition, these two periods are consistent with the policy changes, such as 1991 structural reform and 1995 WTO agreements that further accelerate the trade liberalisation.

<sup>3</sup> It is important to look at the second period (1997-98 to 2004-05), when employment reduced, coincides with acceleration in trade liberalisation led by WTO implied policies as a consequence of the Uruguay Round 1995. Therefore, we can hypothesise that there is a policy-induced change in employment.

**Table 2: Industry-wise Annual Rates of Growth in Employment and Employment Elasticity in Manufacturing Industries (1990-91 to 2004-05)**

<b>NIC Codes</b>	<b>Industries</b>	<b>Employment</b>	<b>Real Exports</b>	<b>Real Imports</b>
15	Food & Beverages	0.99 (0.30)	5.38	16.77
16	Tobacco	0.28 (0.04)	5.83	18.21
17	Textiles	-0.31 (-0.18)	9.83	15.01
18	Wearing Apparel	8.74 (1.29)	7.55	30.05
19	Leather	3.17 (0.42)	12.19	19.59
20	Wood	-2.24 (0.95)	6.02	12.90
21	Paper	1.33 (0.28)	22.56	9.56
22	Publishing, printing	0.82 (0.11)	20.51	28.77
23	Coke, refined petroleum	1.21 (0.10)	24.32	2.29
24	Chemicals	1.74 (0.24)	15.62	8.63
25	Rubber and plastics	4.34 (0.44)	14.33	17.62
26	Other non-metallic mineral products	0.86 (0.19)	15.21	13.01
27	Basic metals	-1.26 (-0.16)	17.51	19.06
28	Fabricated metal products	0.01 (0.00)	14.60	14.02
29	Machinery & equipment	-0.87 (-0.15)	15.16	3.96
30	Office, accounting & computing machinery	-2.73 (-0.94)	12.91	25.54
31	Electrical machinery	0.89 (0.24)	17.66	14.90
32	Radio, television	-1.44 (-0.35)	13.27	22.41
33	Medical, precision & optical instruments	1.62 (0.17)	21.89	13.01
34	Motor vehicles, trailers & semi-trailers	3.58 (0.44)	12.63	10.28
35	Other transport equipment	-5.27 (-1.02)	12.10	17.63
36	Furniture; manufacturing n.e.c.	5.93 (0.51)	4.48	33.35
	<b>All Industries</b>	<b>0.70</b>	<b>11.37</b>	<b>12.24</b>

Source: Annual Survey of Industries, Various Issues.

Note: Unless otherwise stated, growth rates (g), reported in this study, have been derived from yearly estimates of employment (y) using the equation  $\log y = a + gt$ .

Figures in parenthesis are employment elasticity. It express the percentage change in employment growth for a percentage change in growth of output.

An examination of the changes in employment growth of two-digit industries shows that, it has been widely varying across industries. From Table 2 we can infer that, among twenty-two manufacturing industries, seven shows negative employment growth, which

together accounted for 36 per cent of the employment share during 1990-91 to 2004-05. However, the remaining fifteen industries illustrate positive employment growth; six of them fall under less than one per cent growth and only nine industries employment growth is more than 1 per cent but less than 10 per cent per annum which accounted only 25 per cent of the employment share during 1990-91 to 2004-05. During the same period these registered industries performed well in terms of output growth. However, this was not reflected in the employment growth these industries (Kannan and Raveendran, 2009). This gives an interesting question to look at the effect of globalisation on employment. However, no single study could fully capture the different components of globalisation, viz. FDI, Trade, Technology etc. this study focuses the impact of trade liberalisation on employment.

### *Trade and Employment*

Table 2 clearly explains that out of twenty-two industries thirteen import growth is higher than export and having lower employment growth. In particular, the Indian textile industry (NIC-17)<sup>4</sup>, which has 17 per cent employment share among manufacturing industries, is one of the oldest and most significant labour intensive industries in employment generation. Theoretically, it was expected that trade liberalisation expands these labour intensive industries exports and employment. However, here one can see that during 1990-91 to 2004-05, Textile industry annual import growth (15.01 per cent) which is higher than export growth (9.83 per cent) and negative employment growth (-0.31 per cent per annum)<sup>5</sup>. Moreover, this industry labour intensity has decreased 0.69 and capital intensity has increased 1.87 (See Table 2). Similarly, Food and Beverages (NIC-15) is an

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<sup>4</sup> This is evident from the fact that the textile industry accounts for around 4 per cent of the gross domestic product (GDP), 14 per cent of industrial production and 16 per cent of the country's total exports earnings. In fact, it is the largest foreign exchange earning sector in the country. Moreover, it provides employment to over 35 million people (India Brand Equity Foundation, 2008).

<sup>5</sup> The textile industry in Coimbatore, which accounts for a predominant part of the industry in southern India, is in crisis. A substantial part of the capacity of the spinning mills in and around the city, which manufacture yarn, remains idle. Thousands of mill workers have not received their wages for months. They face the even more serious prospect of losing their jobs, as the danger of several units closing down in the immediate future appears to be real. Trade union sources in Coimbatore said that mills had been laying off workers for some years now. About 20 mills had closed in the last two years and at least 10,000 workers had lost their jobs. In one of the National Textile Corporation (NTC) units, the workforce has dwindled from 1,500 one and a half years ago to about 550 now. The spindleage in this unit has been reduced from 78,000 to 36,000 (Sridhar, 1999).

important industry for employment generation, which has 17 per cent employment share shows only 0.99 per cent per annum employment growth and 16.77 per cent import growth that is higher than export growth of 5.38 percent. Moreover this industry labour intensity decreased by 0.72 (Table 3).

In the case of negative employment growth, we can observe that Other transport equipment (NIC-35) and Office, accounting and computing machinery (NIC-30) are the sectors that shows the first and second largest employment reduction by -5.27 and -2.73 per cent per annum during 1990-91 to 2004-05. In addition, these industries annual average import growth 17.63 and 25.54, which are higher than their export growth 12.10 and 12.91 percent and their labour intensity, has decreased to 0.64 and 0.54 respectively.

We have seen that some of the industries import growth exceeding exports growth shown negative employment growth. At the same time, industries which are having higher export growth than import growth did not reflect in their employment growth. For example, Coke, Refined Petroleum Products and Nuclear Fuel<sup>6</sup> (23) industry's export growth is 22.56 per cent, which is higher than their import growth is 9.56 per cent per annum. However, this industry export growth did not indicate the employment growth (1.21 per cent). In addition, his industry output fall under high technology or low labour intensive industry (see Table 3). Thus, the capital-intensive nature of the production of this industry may possibly lead to reduce employment even when exports perform well.

Similarly, annual export growth of Paper and Paper Products (NIC-20) showed 22.56 per cent and import growth is 9.56 per cent. Yet this industry employment growth is only 1.33 per cent during 1990-91 to 2004-05. At the same time, this capital intensity has increased 1.34 between 1990-91 and 2004-05 (See Table 2). Therefore, it can be argued that in the context of heightened global competition, Indian industries are moving from labour intensive exports to capital-intensive exports, which reduces the labour demand.

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<sup>6</sup> Veeramani (2007) mentioned that Mineral fuels export growth has increased from -4.1 per cent in 1993-97 to 403.0 per cent in 1999-2001. The main reason for this sudden increase is, during 1999 Reliance Petroleum Ltd. (RPL) started its refinery at Jamnagar in Gujarat. The RPL refinery is amongst the most technically complex refineries in the world. RPL's exports shot up by 87 per cent which is Rs.685 crores (US\$ 161 million) in the financial year 1998-99 (Press Release, Reliance, 1999)

Subrahmanian and Joseph (1994) highlighted that in Indian context the choice of production technique with higher capital/labour ratio renders some competitive advantage of real cost-efficiency to the exporting firms. This again implies our aggregate analysis hypothesis.

### **Trade, Tariff and Employment**

Further, in order to understand the characteristics of the manufacturing sector in connection with tariff i.e. protection and trade we present the details of industries tariff rate, labour and capital intensity, export and import intensity in Table 2. The table ranks two-digit industries by descending order of labour intensity, and it presents some basic statistics of the industry. The table shows that in all the industries protection has reduced. Moreover, we can observe that industries with high labour intensities are having relatively higher protection during the initial period<sup>7</sup>. Sectors such as manufacture of tobacco products (16), wearing apparel (18) and furniture (36), for example, were among the most protected, which are higher labour intensive industries during 1990-91. While industries like coke, refined petroleum products (23), chemical products (24) and basic metals (27) were relatively more open which are capital-intensive. Second, import intensity was significantly lower in highly protected labour-intensive industries than, more open, capital-intensive sectors.

Though tariff barriers has reduced significantly from 100 per cent in 1990-91 by 71.25% and 85.2% in respective industries of tobacco products (16) and wearing apparel (18) in 2004-05, still these industries have high rank in terms of labour intensity. However, these industries labour intensity has decreased by 7.22 and 1.63 between 1990-91 2004-05 respectively. Furthermore, their capital intensity increased by 0.05 in tobacco and 0.62 in apparel sector during 1990-91 to 2004-05; import intensity did not show any significant changes during this period, however export intensity has increased marginally. Moreover, some of the industries like Publishing, printing and reproduction recorded media (22),

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<sup>7</sup> This is consistent with Revenga (1997) findings that workers in highly protected industries had lower wages and were more labour intensive in Mexico.

Food and Beverages (15) export intensity has increased and at the same time these industries capital and import intensity increased.

**Table 3: Protection Rate, Capital Intensity, Labour Intensity, Export Intensity and Import Intensity by Industry (1990-91 to 2004-05)**

1990-91						Difference between 1990-91 to 2004-05				
	Tariff	L intensity	Export Intensity	Import Intensity	K Intensity	Tariff	L intensity	Export Intensity	Import Intensity	K Intensity
16	100.00	10.69	0.01	0.00	0.29	71.25	7.22	-0.02	0.00	-0.05
18	100.00	2.82	1.73	0.00	0.43	85.20	1.63	0.36	-0.01	-0.62
36	123.45	2.02	4.64	0.06	0.86	108.79	1.37	2.46	-0.40	-0.02
20	60.12	1.80	0.03	0.02	1.12	45.59	1.18	-0.07	-0.10	-1.40
22	59.06	1.24	0.04	0.07	1.07	47.66	1.03	-0.07	-0.25	-1.66
15	87.14	1.12	0.08	0.01	1.43	44.92	0.72	-0.05	-0.06	-0.86
17	100.05	1.03	0.17	0.01	1.33	84.81	0.69	-0.20	-0.06	-1.87
35	49.84	0.93	0.05	0.08	1.17	29.62	0.64	-0.09	-0.63	0.16
28	73.23	0.92	0.08	0.03	1.22	58.46	0.39	-0.23	-0.10	-0.01
29	70.93	0.88	0.06	0.20	1.03	56.08	0.54	-0.15	-0.36	-0.14
19	73.03	0.70	0.49	0.04	1.59	58.65	-0.14	-0.34	-0.09	-0.04
31	75.85	0.67	0.03	0.06	0.89	61.41	0.32	-0.13	-0.25	-0.18
33	61.09	0.62	0.09	0.64	1.64	47.62	0.32	-0.25	-0.57	0.60
32	92.43	0.54	0.05	0.16	1.42	86.12	0.41	-0.04	-0.85	-1.17
30	146.94	0.53	0.11	0.25	1.10	144.17	0.43	-0.20	-2.06	-1.75
34	73.15	0.50	0.07	0.05	1.12	48.44	0.33	-0.02	0.01	-0.34
25	90.38	0.48	0.05	0.03	1.69	75.70	0.29	-0.10	-0.05	-1.19
26	80.98	0.47	0.02	0.02	2.46	66.20	0.30	-0.09	-0.04	-0.67
21	85.30	0.34	0.01	0.11	2.50	71.29	0.17	-0.06	-0.11	-1.34
24	82.36	0.22	0.08	0.18	2.61	66.99	0.10	-0.16	-0.11	0.68
27	79.59	0.17	0.03	0.07	3.87	62.52	0.10	-0.10	-0.25	1.91
23	37.50	0.11	0.04	0.20	1.46	25.87	0.09	-0.16	0.07	-0.37

Source: Annual Survey of Industries, Different Issues, Commodity Trade (COMTRADE) and Trade Analysis Information System (TRAINS), United Nations Conference on Trade and Development (UNCTAD) and Integrated Data Base (IDB), World Trade Organization

Note: Here Tariff defined as the Import-weighted average of effectively applied rates, Labour intensity defined as number of employees per unit of fixed capital (in real terms), Capital intensity defined as Fixed Capital (in real terms) per unit of Net Value Added, Export or Import intensity defined as Exports / Import (in real terms) per unit of Value of Output

## **Hypotheses and Variable Construction**

The descriptive analysis undertaken thus far have had certain interesting conclusions and pointed towards emerging trends. The following section has discussed the variables, which affect employment through trade openness and provides econometric model for further analysis.

### ***Trade and Employment***

When any country liberalizes its trade regime, it has to face international competitive pressure, which may lead to the use of labour saving technologies and reduce employment (Onaran, 2008 and Goldar, 2000). Import is one of the important channels through which trade generates competition in the domestic markets. Therefore, it is important to measure the effect of import competition on employment in manufacturing sector. Sen (2008) pointed that import penetration ratio is a measure which helps to evaluate the import competition as well as separate the effects of import competition from export orientation on the efficiency in use of labour. Hence, the present study used import penetration ratio for measuring the effect of import competition on employment in manufacturing sector. Import penetration ratio for a particular industry, as defined by Sen (2008), is measured as its imports as a ratio of domestic demand (i.e.,  $\text{imports}/(\text{imports}+\text{output}-\text{exports})$ )<sup>8</sup>.

However, Wood (1991) argued that the import penetration ratio is a one-sided measure. It neglects the gains in employment generated by increased exports to other countries. Hence, it is important to include export intensity in the model in order to observe the effect of export-orientation on employment. Increased exports have a positive effect on the level of output, tending to increase employment (Sen, 2008) noted earlier scale effect. Overall, the scale effect expresses the positive effect of export-orientation on employment. However, Spiezia (2004) claimed that H-O model and technology-gap theories of trade lead to opposing predictions regarding the impact of trade openness on employment in developing countries. If differences in productivity gap between developing and industrialized countries were larger for labour than for capital then developing countries would end up with exporting capital-intensive goods and creating less employment. Further, she emphasized that due to openness of trade, developing

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<sup>8</sup> Here output denotes the value of total output.

countries could fill the productivity gap in capital by importing more efficient machinery from the industrialized countries, which would reduce employment in developing countries. Overall, she found that India's labour intensity with respect to exports is -0.108, imports is -0.526 and with non-trade goods is 0.465. This suggests that the effect of export on employment, whether positive or negative, depends upon the nature of export. Exports intensity or export-orientation is defined as the ratio of exports to value of output<sup>9</sup>.

### ***Trade Policy and Employment***

Those who focus on the long-run efficiency gains of trade liberalization argued that free trade acts as a positive force towards specialization, trade creation, and productivity gains. On the other hand, those who focus on the short-run costs of free trade argued that trade liberalization leads to jobs loss in the manufacturing sector, which has been heavily protected by tariffs (LaRochelle, 2007). The following empirical evidence has supported this view. Gaston and Trefler (1994, 1997) and Beaulieu (2000) found that free trade was directly responsible for a significant job loss in Canadian manufacturing industries that were protected initially by import tariffs. The general observation of these papers are that all the job losses cannot be attributed to free trade but part of it can be explained through the reduction of local import tariffs. On the other hand, another set of empirical studies by Hanson and Harrison (1999) and Revenga (1997) found modest impact of reduction of tariff and non-tariff barriers on employment in Mexican manufacturing industries. The lack of employment response is largely attributed by the author to imperfect competition. Investigating the impact of liberalisation on employment Banga (2005) discovers that, in India, trade liberalisation (measured through the Effective Rate of Protection) does not have significant impact on manufacturing industries' employment for the period 1991-92 to 1997-98. It is evident from the different countries' experience that the link between openness of trade and labour market responses is largely country-specific issue and tends to vary from one country to the other.

Employment can be affected by many factors other than trade liberalisation such as technological change, labour market rigidities and macroeconomic changes etc. Therefore, the multi-dimensionality of the openness of trade requires a careful control for

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<sup>9</sup> Same as footnote 5

non-trade factors to isolate the impact of trade on employment (Wood, 1991; Achy and Sekkat, 2004). By surveying the existing studies, the following variables are identified in order to control the non-trade factors. Rest of the present section is organized as follows. It starts with highlighting the hypotheses of control or industry-specific variables subject to empirical testing followed by the description of the data and the method and regression results.

### ***Output:***

The demand for labour, like that of all other factors of production, is a derived demand which depends on the volume of final output being demanded from a firm and therefore being supplied by it (Kambhampati and Howell, 1998). Therefore, output growth is an important factor, which influences the demand for labour. Onaran (2008) mentioned that in the analysis of trade induced employment changes, to capture the scale effect of offshoring in the labour demand estimation, value added is the appropriate measure rather than output. Since importing intermediate inputs might decrease the demand for labour for a given level of value added, after it would increase through the scale effect. Therefore, the present study uses real net value added (NVA) instead of value of output in the analysis. Real net value added is measured at 1999-2000 prices using industry price indices obtained from Office of the Economic Advisor, Ministry of Commerce and Industry.

### ***Emoluments per worker***

Real wages or earnings of the employee are one of the most significant determinants of demand for labour. The traditional labour demand theory suggests that increasing the wage rate will push the employers to cut employment. For analysing this hypothesis this study uses real emoluments<sup>10</sup> per worker as the indicator of labour cost. Emoluments per employee is defined as the ratio of real emoluments to the total employment. Real emoluments is measured at 1999-2000 prices using consumer price indices for industrial workers from Labour Bureau, Ministry of Labour and Employment, and Central Statistical Organisation, Government of India.

### ***Capital-Labour Ratio***

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<sup>10</sup> In this study, number of employees included both workers and other employees. Accordingly, for measuring the labour cost we used emoluments instead of wages.

Goldar (2000) argued that in the new economic policy regime, due to increased competition industrial firms might try to save cost and become more competitive by cutting down employment. Improved access to foreign technology and imported capital goods would drive the industrial firms towards the adoption of advanced technology, which is likely to lead to increased capital intensity of production. This leads to the reduction of employment opportunity in the industrial sector. We examined the impact of the capital intensity by taking into consideration of the ratio of real fixed capital to labour. Capital stock is measured at 1999-2000 prices; the deflator used being the wholesale price index of machinery and machine tools.

### ***Mandays lost due to industrial disputes per employee***

A popular hypothesis, particularly in Indian organised sector, is the increase in wage rate that assumed to have taken place at the evidence of growing rigidities in the labour market or growing strength of trade unions (Nagaraj, 1994), which increases the cost of labour. Hence, strength of the trade unions is important in employment decisions. Lucas (1988) advocates that in wage settlement, power of unions is reflected in increased number of mandays lost due to industrial disputes. Therefore, the study uses mandays lost due to industrial disputes<sup>11</sup> as a proxy for the strength of trade unions, which is an institutional variable, on employment decision of employer. The industrial disputes and mandays lost data have been taken from various issues of Indian Labour Statistics brought out by Labour Bureau at the three-digit level. This variable has been computed by dividing mandays lost due to industrial disputes by the total number of employees.

### **Econometric Model**

Drawing from the discussion so far made we have specified the following model to explore the bearing of various trade related and other factors on employment in India's manufacturing sector.

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<sup>11</sup> Industrial disputes include temporary stoppage of work by a group or all employees of an establishment (strike) to press a demand. In addition, temporary withholding of work from a group of employees by an employer (lockout) in a unit, in connection with matters relating to employment or unemployment or terms and conditions of employment is taken as an industrial dispute. (Indian Labour Statistics, Labour Bureau, GOI, Ministry of Labour)

$$\text{LNEMP} = \alpha + \beta_1 \text{LNEI}_{it} + \beta_2 \text{LNIPR}_{it} + \beta_3 \text{LNIWT}_{it} + \beta_4 \text{LNK/L}_{it} + \beta_5 \text{LNNVA}_{it} + \beta_6 \text{LNEMO\_EMP}_{it} + \beta_7 \text{ML\_PE}_{it} + \mu_i + u_{it} - (1)$$

where, EMP = Employment

EI = Export Intensity

IPR = Import Penetration Ratio

IWT = Import Weighted Tariff

K/L = Capital-Labour ratio

NVA = Real Net Value Added

EMO\_EMP = Real Emoluments per employee

ML\_PE = Mandays Lost per employee

$\mu_i$  represents industries dummy

$u_{it}$  = residuals

for all  $i = 1, 2, \dots, n$  and  $t = 1, 2, \dots, n$  where  $i$  and  $t$  represents industry and time respectively.

All variables are in log (LN) form except import weighted tariff since it is percentage term.

### **Results of the Estimated Model**

The present study started panel analysis with pooled ordinary least squares (OLS) regression. The estimated results indicate that export-intensity and import weighted tariff does not have significant effect on employment and import penetration ratio affects negatively. However, pooled regression biases the estimated results upwards if significant cross-section or time fixed-effect are present (Bhalotra, 1998). Therefore, to sort out this problem we have estimated the Breusch and Pagan lagrangian multiplier test which helps to identify whether pooled regression is consistent or not. The estimated result of this test produces  $\chi^2 = 1174.49$  which is statistically significant, implying that pooled regression is not an appropriate methodology for our data set. However, this test does not show that whether fixed effect or random effect model is significant. Hence, we have estimated Hausman Specification test, which informs whether fixed-effects or random-effects model is reliable. The test yields statistically significant result ( $\chi^2 = 350.79$ ) which indicates that fixed effects model is consistent. Therefore, hereafter we are interpreting the fixed effects model results. Though co-efficient values differ from fixed effects

model, random effects model variables signs, except import-weighted tariff, are not different. The value of  $R^2$  in all the estimates assures the goodness of fit of the model. F and Wald chi2 values are significant at 1 per cent level. Overall, the regression model employed is adequate to examine the causal relationship between free trade and employment. Apart from the above arguments, in fixed effects model, F-test that hypotheses all  $u_i=0$  yields value  $F(34.27)$  which is statistically significant indicates that the industry dummies are jointly significant. It also means that the OLS estimates, which omit these industry dummies, suffer from the problem of omitted variables and lead to biased and inconsistent results (Baltagi, 2008). This again confirms that fixed effects model is relevant for the present study.

**Table 4: The Effect of Trade Liberalization on Employment in the Manufacturing Sector**

<b>Dependent Variable : <i>Number of employees</i></b>				
<b>Model</b>	<b>Pooled OLS</b>	<b>Fixed Effects</b>	<b>Random Effects</b>	<b>Fixed Effects</b>
<b>Regressors</b>	<b>Co-efficient (t-value)</b>	<b>Co-efficient (t-value)</b>	<b>Co-efficient (z-value)</b>	<b>Co-efficient (t-value)</b>
<i>Constant</i>	-0.860* (-4.350)	3.574* (10.010)	1.765* (5.280)	4.184* (11.740)
<i>LN EI</i>	0.007 (0.620)	-0.096* (-7.090)	-0.045* (-3.290)	-0.113* (-8.190)
<i>LN IPR</i>	-0.036* (-3.020)	-0.039* (-2.950)	-0.044* (-3.180)	-0.028** (-2.300)
<i>IWT</i>	0.000 (-0.740)	-0.001* (-2.730)	0.000 (-0.980)	0.000 (-1.310)
<i>LN K/L</i>	-0.405* (-23.650)	-0.153* (-6.720)	-0.241* (-10.780)	-0.114* (-5.190)
<i>LN NVA</i>	0.883* (83.140)	0.469* (24.50)	0.623* (35.360)	0.418* (21.430)
<i>LN EMO_EMP</i>	-0.222* (-7.350)	-0.024 (-0.880)	-0.077* (-2.650)	-0.016 (-0.600)
<i>LN ML_PE</i>	-	-	-	-0.043* (-6.570)
R <sup>2</sup>	0.919			
Within		0.549	0.533	0.561
Between		0.887	0.945	0.829
Overall		0.843	0.903	0.762
F-Statistic	1485.50*	148.22*	-	119.85
Wald	-	-	$\chi^2(6)=1470.31$	-
F-test that all $u_i=0$		34.27*	-	41.87
Lagrangian multiplier test			$\chi^2=1174.49$ (p=0.000)	
Hausman Specification Test	-	$\chi^2=350.79$ (p = 0.000)		
Number of Observations	787			714

\* - significant at 1%, \*\* - significant at 5% and \*\*\* - significant 10%

Results arrived based on fixed effect panel regression confirms the following observations (Table 4). All the co-efficient signs, except export-intensity and import weighted tariff, are as expected. Thus, the estimated fixed effects model indicates that

import penetration ratio has a significant negative effect; one per cent increase in import penetration leads to -0.039 per cent reduction in industry's total employment. This tends to suggest that import competition has strong negative association with employment and it confirms the theoretical argument of substitution effect. The negative sign of the export-intensity co-efficient implies a negative relationship between export-orientation and employment contrary to the one expected in the theory. Yet, unpredicted result of export intensity shows that it has significant negative effects on employment; one per cent increase in exports intensity reduces employment by -0.096 per cent. One explanation for the negative effect of export-intensity on employment is the increased capital-intensive or high technology nature of exports of manufactured products. IIFT (2008) finds that low-technology industries exports, which can generate more employment, have decreased from 52 per cent in 2002-03 to 38 per cent in 2006-07. At the same time medium and high technology exports has increased from 21 to 34 per cent and 6 to 10 per cent over the period of 2002-03 to 2006-07 respectively. Import weighted tariff does not have significant effect on employment. Capital-labour ratio negatively affects employment with one percent increase of capital intensity leads to decrease in employment by -0.153 per cent. This highlights the substitutability of capital for labour, which results in reduction of employment. As expected earlier, value added is having a statistically significant positive impact on employment; one per cent in real net value added leads to increase in employment by 0.469 per cent. The insignificant co-efficient of emoluments per employee did not support the classical labour demand theory, when cost of labour increases employers will try to reduce the employment. The insignificant results possibly due to the argument given by Chandrasekar and Ghosh (2007) that falling real wages or cheap labour have not been sufficient to ensure employment growth after 2000 because the negative effects of openness on employment generation have been strong enough to offset the benefits of the cheap labour for employers.

Thus far, we presented the panel regression results without mandays lost per employee due to fewer observations of mandays lost. However, the model with mandays lost per employee did not change the results. Export intensity, import penetration ratio has a significant negative effect on employment. Import weighted tariff does not have

significant effect on employment. Other control variables are showing expected signs. Mandays lost per employee has a significant negative effect on employment. This implies that institutions like trade unions are also important in the case of employment decision.

### **Conclusion**

Employment generation, particularly in industries, is considered as one of the ways to achieving inclusive growth. However, organised manufacturing sector, which could provide well secured jobs are facing jobless growth in recent years. Various researchers have analyzed the phenomenon of jobless growth in a closed economy framework. It is important to note here that organised sector jobless growth, especially after 1996, coincided with India's unprecedented integration with rest of the world through trade and the initiation of further trade liberalisation induced by WTO. Yet it is surprising to note that the impact of trade liberalisation on employment has not received much attention of scholars. Therefore, the present paper tried to examine the effect of trade liberalisation on employment during the post-reform period in India's organised manufacturing sector. The analysis shows that, trade seems to be having negative effect on employment, which is contrary to H-O theory. This does not mean that increasing trade is not good for employment generation. The trade induced negative effect on employment is possibly due to, capital-intensive nature of the, composition of trade. Therefore, it is important to encourage the labour-intensive sectors exports, which can generate employment for unskilled workers.

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