



**Impact of Trade Liberalization on Employment: The  
Experience of India's Manufacturing Industries**

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## Introduction

- **11<sup>th</sup> Five year plan – Inclusive Growth**
- **Organized Sector Industries Employment has decreasing in recent years**
- **Jobless Growth – job security regulations, growth in mandays, growth in wage, increased capital intensity etc. (Goldar, 2000 and 2002, Nagaraj, 2000, 2004 and Kannan and Raveendran, 2009).**
- **Custom tariff - 300% in 1990-91 to 35% in 2001-02**
- **NTB barriers has also decreased drastically**
- **Imports and Exports are increasing continuously**

**Does the changes in trade policy and trade reflect the  
observed decline in employment in Indian  
Manufacturing industries?**

## Analytical Context

- **Heckscher-Ohlin**
  - **When the economy open for free trade each country moves towards specialization in the production of the good in which it has comparative advantage in terms of factor endowments.**
  - **Consequently, in developed countries, the demand for capital rises and that of labour falls.**
  - **On the other hand, in developing countries, the demand for labour rises and that of capital falls.**

# Channels through which Trade Reforms affect Employment

**There are two main channels through trade reform can affect manufacturing employment**

**Scale Effect**

**Increased exports have a positive effect on the level of output, tending to increase employment**

**Substitution Effect**

**Allow Cheaper Imports of Intermediate and Capital inputs. These imports substitutes the services of domestic labour**

## Literature – Trade and Employment

- **Onaran (2008) - there is a significant negative effect of imports on employment & wages in Austrian manufacturing industries.**
- **Revena (1992) & Feenstra and Hanson (1996) - increase in import competition or outsourcing has significant effect in terms of decrease in employment in US.**
- **Christer, Kupets and Lehmann (2005) & Abdi and Edwards (2002) - trade reform is not a major factor in the determination of employment in Ukraine and South-Africa respectively.**

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## **Trade Policy & Employment**

- **Beaulieu (2000) & Gaston and Trefler (1994, 1997) - free trade was directly responsible for a significant job lost in Canadian manufacturing industries which are most protected initially.**
- **Revenga (1997), Hanson (1999) and Feliciano (2001) -impact of trade reform or reduction of tariff barriers does not have significant effect on employment in Mexico and Morroco**

## Trade and Employment - India

- **Ghose (2000) - In manufacturing industries employment elasticity increases for the period 1981-94. But the share of export-oriented industries employment has actually has been declining, thus, the observed rise in employment elasticity cannot be attributed to export growth & trade did not adversely affect employment growth in import competing industries.**
- **Goldar (2002) - Employment elasticity increased in the post-reform period except import-competing industries.**

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- **Banga (2005) - exports positively affects employment and imports do not have significant impact on the employment**
- **Hasan, Mitra and Ramaswamy (2003, 2007) - labour demand elasticities, with respect to wages increased after the trade reforms particularly in states which are having flexible labour markets.**
- **Sen (2008, 2009) - did not find any significant effect of export orientation and import penetration on employment.**
- **Goldar (2009) - trade liberalisation had a positive effect on the labour demand elasticity in Indian industries.**

## Data Construction

- **Annual Survey of Industries (ASI) - Central Statistical Organization (CSO).**
  - **Employment & Emoluments at Industry (1993-94 to 2004-05)**
  - **Different NIC classification (NIC87, 98 and 2004)**
  - **Concordance (NIC 98)**
- **Trade Data**
  - **Commodity Trade (COMTRADE) - United Nations Conference on Trade and Development (UNCTAD)**

## *Contd...*

- **Tariff Data**
  - **Trade Analysis Information System (TRAINS) - UNCTAD**
  - **& Integrated Data Base (IDB) - World Trade Organization (WTO)**
- **International Standard Industrial Classification (ISIC Rev. 3)**
- **22 two digit and 53 three digit industries for the period 1990-91 to 2004-05**

## 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.

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

NIC Codes	Industries	Employment	Real Exports	Real Imports
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.

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

- **Out of 22 two-digit industries 13 shows negative/less than one per cent employment growth.**
- **Textile – Exports (9.83) – Imports (15.01) – Employment (-0.31)**
- **Coke, Refined Petroleum products – Exports (24.32) – Imports (2.29) – Employment (1.21)**
- **Paper and paper products - Exports (22.56) – Imports (9.56) – Employment (1.33)**

# Hypotheses and Variable Construction

## Trade and Employment

***Import Penetration Ratio:*** 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 [imports/imports+output-exports] (Sen, 2008).

***Export Intensity:*** Increased exports have a positive effect on the level of output, tending to increase employment. Overall, the scale effect expresses the positive effect of export-orientation on employment.

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- ***Trade Policy:*** Industries' import weighted tariff, which is appropriate for analyzing the effect of tariff reform on industry's total employment (Effectively Applied Rates of protection).
- ***Output:*** We used real net value added. We can expect that higher the net value added of the factory leads to higher the employment.
- ***Emoluments per worker:*** 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 per worker as the indicator of labour cost.

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***Capital-Labour ratio:*** 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.

- ***Mandays lost due to industrial disputes per employee:*** Strength of the trade unions is important in employment decisions. In particular, wage settlement, power of unions is reflected in increased number of mandays lost due to industrial disputes (Lucas, 1988) .

## Econometric Model

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

# The Effect of Trade Liberalization on Employment in the Manufacturing Sector

<b>Dependent Variable : <i>Number of employees</i></b>		
<b>Model</b>	<b>Fixed Effects</b>	<b>Fixed Effects</b>
<b>Regressors</b>	<b>Co-efficient (t-value)</b>	<b>Co-efficient (t-value)</b>
<i>Constant</i>	<b>3.574* (10.010)</b>	<b>4.184* (11.740)</b>
<i>LN EI</i>	<b>-0.096* (-7.090)</b>	<b>-0.113* (-8.190)</b>
<i>LN IPR</i>	<b>-0.039* (-2.950)</b>	<b>-0.028** (-2.300)</b>
<i>IWT</i>	<b>-0.001* (-2.730)</b>	<b>0.000 (-1.310)</b>
<i>LN K/L</i>	<b>-0.153* (-6.720)</b>	<b>-0.114* (-5.190)</b>
<i>LN NVA</i>	<b>0.469* (24.50)</b>	<b>0.418* (21.430)</b>
<i>LN EMO_EMP</i>	<b>-0.024 (-0.880)</b>	<b>-0.016 (-0.600)</b>
<i>LN ML_PE</i>	<b>-</b>	<b>-0.043* (-6.570)</b>
<b>R<sup>2</sup></b>	<b>0.843</b>	<b>0.762</b>
<b>F-Statistic</b>	<b>148.22*</b>	<b>119.85</b>
<b>Wald</b>	<b>-</b>	<b>-</b>
<b>F-test that all u<sub>i</sub>=0</b>	<b>34.27*</b>	<b>41.87</b>
<b>Lagrangian multiplier test</b>		
<b>Hausman Specification Test</b>	<b><math>\chi^2=350.79</math> (p = 0.000)</b>	
<b>Number of Observations</b>	<b>787</b>	<b>714</b>

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

## **Concluding Observations**

- **Employment in Indian organised manufacturing industries has decreased in recent years.**
- **Exports and Imports has increased.**
- **Both import penetration and export intensity shows negative effect on employment in India's organised manufacturing sector.**
- **Tariff reduction does not have significant impact on employment.**

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