

# **Technology Intensity and Global Competitiveness: Issues in Labour Cost and Employment**

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## **Abstract**

An important aspect of competitiveness is reduction in cost of production. Among various costs it is popularly believed that labour component comprises the biggest chunk. Though productive employment generation is an important objective in most of the developing countries this motivation has probably induced firms to adopt capital intensive techniques. Based on the country specific data on the manufacturing sector in select developing countries the argument of high cost of labour reducing labour absorption has been examined critically. The effect of labour market regulations on employment has also been assessed. Evidence does not favour labour market deregulation; rather skill factor reveals a negative impact on employment, implying a mismatch between the available labour quality and the labour demand in these countries tends to reduce employment. The wage elasticity of employment does not turn out to be high across countries. Hence, the argument favouring wage flexibility through labour market deregulation is again not empirically justified. The results are also indicative of a weak relationship between productivity and wage, which with labour market deregulations would further weaken these links, leading to gross inequality in income.

Keywords: labour market, deregulation, wage elasticity

JEL Classification: J08, J40, L50

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## **1. Introduction**

In the backdrop of globalization developing countries are trying disparately to reduce the cost of production in a significant manner so that it can help them achieve an edge over others in terms of competitiveness. Labour costs are usually thought to be highly significant. And hence, constant and continuous efforts to pursue capital intensive methods of production are made to attain significant labour productivity gains and to reduce the labour costs. As labour intensive methods also involve a huge range of uncertainties due to labour unrest, capital intensive technological progress is thought to be an obvious solution. No doubt, productive employment generation is an important challenge for most of the developing countries. Thus keeping in view several rigidities including unionisation and the lack of flexibility which pose major constraints and hamper the smooth functioning of firms, labour market reforms have been suggested on a large scale in order to improve the competitiveness of the countries. Economic reforms in various spheres have already been introduced to remove bureaucratic and other structural rigidities in the system and enhance economic growth, which in turn is thought to reduce poverty by generating gainful job opportunities. However, in the Indian context for example, the lack of labour market deregulations is viewed to be a major constraint in generating productive employment in the formal manufacturing sector and attaining other desirable goals in terms of attracting FDI and rapid industrialisation. This is because globalization and shifts in the production activities are expected to impact on the labour market outcomes such as wages, employment and labour productivity. Secondly and more importantly, for other reforms, in the area of trade for example, to be successful, labour market reforms are considered as essential prerequisites. It is generally viewed that the labour markets in developing countries are rigid in terms of work practices, wages, hiring and firing

policies, etc, and all this has been attributed to the existing labour laws (Fallon and Lucas, 1991)<sup>1</sup>.

On the whole, sluggish employment growth or the absence of significant effects of growth on living standards through productive employment generation is viewed as an outcome of strict labour market regulations. For example, Botero, et. al. (2004) noted that countries which have tough labour-market regulations have lower rates of labour-market participation and higher levels of unemployment. In the case of India, findings of Amin (2008) reveal that the labour regulation has sizable and negative effects on employment growth. Focusing on the Indian states, Almeida and Carneiro (2008) found that inflexible labour regulations not only constrains firm size but also reduces employment. Ahsan and Pagés (2008) argued that employment protection diminishes output and employment without benefiting workers much. In the case of Colombia, Kugler (2004) finds that a reduction in firing costs reduces the level of unemployment.<sup>2</sup> Findings of Connell et al. (2008) suggest that labour market reforms have several beneficial effects on employment and the quality of life of labours. In an important study, Hasan, et al. (2003) observed that labour demand elasticity increases with reductions in protection. Providing evidence from a panel of 48 developing countries, his findings suggested that trade liberalisation is more likely to have a beneficial impact when labour markets are flexible and vice versa. More regulated and rigid labour markets are associated with higher real wages, which, however, come at the expense of employment.

Some of the studies also indicate that flexibility in the labour market with reforms in other sectors of the economy is expected to raise employment and also the real wages in the long-run, if not in the short-run (Fallon and Lucas, 1991). Reforms in trade sector, for example, provide reorientation in production towards exports, which is expected to have a favourable

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<sup>1</sup> The World Bank report on “Doing Business in 2005” estimated that India is ranked at 48<sup>th</sup> in terms of ‘Rigidity in Employment Index’<sup>1</sup> compared to China’s rank of 30.

<sup>2</sup>For a detailed review of the related literature, in the case of developing countries, can be seen in Djankov and Ramalho (2008).

impact on employment (Krueger, 1983; Balassa, 1986).<sup>3</sup> Evidence on limited benefits from trade liberalisation for the typical worker largely refers to the Latin American experience. Some argue that trade does have the potential to benefit workers at large though the nature of labour market regulations actually play an important role in giving a tangible shape to these benefits (Edwards and Edwards, 1994). Hence, one important view, as mentioned above, is that with the presence of regulated labour market, the overall impact of economic policy may not necessarily have positive impact on employment generation. While there may be a case for removing labour market rigidities by discouraging the political patronization of the unions and relaxing the strict labour laws that prohibit employment growth, attention also needs to be given to the labour welfare issues. There is a fear that flexibility may expand employment but affect wages and social security support to the labour adversely. Hence, the debate continues as to whether labour market deregulations are to be pursued aggressively or the national governments should be more careful in recommending major flexibility to the employers.

Given the vast stretches of underemployment and poverty, developing countries cannot afford to have rapid growth that does not benefit labour in a significant way. Hence, there has emerged a strong case for speedy reforms in the labour market together with reforms in other segments of the economy. But it is a well-known fact that in the process of economic reforms there are certain social costs particularly for the existing labour force, and any such reforms without addressing these costs would only have adverse impact on the labour market and economy. For example, Besley and Burgess (2004) estimate that "pro-worker" labour reforms in India have adversely affected employment and productivity and increased poverty

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<sup>3</sup>Despite the generally favourable expectations of job creation as a result of the reforms, various theoretical considerations, experience show that the impact of the reforms on the labour markets generally negative in an initial phase. Liberalization impairs import competing activities, while the policies of State reform tend to constrain public sector growth. Both factors have a negative short-term impact on employment in the initial years (see Weller, 2001).

in the country. Goldar (2004) argued that the unions in India have become weaker in the reform period, which caused a slow-down in the growth rate of real product wage rate in the organized manufacturing in the nineties. Further, the ILO-SAAT study (ILO-SAAT, 1996) emphasizes that although labour market reforms could reduce the social costs of structural adjustments, it cannot minimize the social costs of stabilization. Though deregulation might be desirable in the context of increasing integration of a particular economy with the global economy, any reform in the labour market, the study argues, needs to be a gradualist one and it has to be accompanied by appropriate social safety nets and some institutional innovations that help the job losers in the process of labour reallocation. Hasty reforms would only reduce the social welfare. Moreover, given the fact that the organized labour market in several developing countries, like India, accounts for only a small fraction of the work force, “it is legitimate to wonder if labour market reform can be of much consequence in such context” (ILO-SAAT, 1996). But there is a need for a balanced view on this issue as both labour and capital have been pushed to the market forces following the reforms. Furthermore, it is also important to take into account that labour market reforms cannot be viewed in isolation but rather as a component of a comprehensive program of structural reforms (see e.g. Agénor, et al., 2007).

Against this background, in this paper, we attempt to provide answer to several important questions related to employment, wage rate, labour market reforms and productivity. Specifically, the analyses of this study have five important objectives. First, in a cross country framework, we attempt to examine how responsive employment is in relation to wages in the manufacturing sector. Second, we analyse the elasticity of employment and wages to estimate their impact on labour productivity and real wages in manufacturing sector for a set of countries. Third, our analysis seek to quantify how much of productivity growth actually gets transferred to the workers. Fourth, in order to evaluate the case of labour market

deregulation, we attempt to estimate the cost of labour in production process in a set of countries. Finally, focusing on an interesting case of India, we attempt to analyse the wage-productivity nexus in the manufacturing sector.

The outline of the rest of the paper is as follows. Section 2 examines the employment elasticity with respect to wages and the wage-productivity linkage based on key indicators of labour market statistics for the manufacturing sector. Section 3 uses different indicators of labour market deregulation in order to examine its effect on employment. Section 4 focuses on Indian organised or formal manufacturing sector as a case study and section 5 summarises the major findings.

## **2. Wage Elasticity of Employment and Wage-Productivity Relationship**

Since much of the focus of labour market deregulation lies on introducing wage flexibility or in other words, removal of downward stickiness of wages so as to expand employment opportunities in the high productivity sector. With this viewpoint, we may like to examine how responsive employment is in relation to wages in the manufacturing sector. Specifically, we are interested to know whether change in wage rate affect the level of employment in developing countries. For this purpose, we utilize information from ‘The Key Indicators of the Labour Market’ (hereafter KILM).<sup>4</sup>For knowing the inter-linkage, we have computed wage elasticity of employment, which is presented in Table 1. The table also gives the rate of growth of employment in industry (manufacturing and allied activities) and the rate of growth of wage in the manufacturing sector. Wage elasticity of employment defined as the ratio of the rate of growth of employment to that of wages turns out to be close to unity or more than unity with a negative sign only in the case of Cambodia, Mexico and Uruguay. Though in some of the other countries the magnitude is high, the elasticity is seen to have a wrong (or

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<sup>4</sup>KILM is of the International Labour Office (ILO)’s research tool for labour market information. The first KILM was released in 1999. It has since become a flagship database of ILO and is used on a daily basis by researchers and policy-makers throughout the world.

positive) sign and in the rest of the countries the elasticity is quite low even when it is negative. This piece of evidence may be taken to suggest that deregulation in terms of wage flexibility does not have a strong standing across countries. In other words, raising employment substantially through wage reduction does not seem to be promising in a large majority of the developing countries. However, it would be interesting to examine if similar patterns emerge from the United Nations Industrial Development Organization (UNIDO hereafter) data as well.

**Table 1: Employment Growth, Wage Growth and Wage Elasticity of Employment in Industry (KILM Data)**

| Country                  | Emp. Gr. in Industry(1) 1993-05 | Country   | Period  | Wage Growth in Mfg. (2) | Wage Elasticity(3) |
|--------------------------|---------------------------------|-----------|---------|-------------------------|--------------------|
| Algeria                  | 1.45                            | Algeria   | 92-96   | -7.67                   | -0.19              |
| Angola                   | 0.28                            |           |         |                         |                    |
| Argentina                | 5.33                            | Argentina | 90-01   | 1.07                    | 4.98               |
| Bangladesh               | 1.29                            |           |         |                         |                    |
| Belize                   | 0.51                            |           |         |                         |                    |
| Benin                    | 1.12                            |           |         |                         |                    |
| Bhutan                   | 1.26                            |           |         |                         |                    |
| Bolivia                  | 0.63                            | Bolivia   | 96-00   | 5.26                    | 0.12               |
| Botswana                 | 0.011                           | Botswana  | 2004-05 | -4.71                   | -0.002             |
|                          |                                 |           |         |                         |                    |
| Brazil                   | 0.89                            | Brazil    | 94-02   | -3.77                   | -0.24              |
| Burkina Faso             | 1.55                            |           |         |                         |                    |
| Cambodia                 | 11.9                            | Cambodia  | 96-01   | -4.48                   | -2.66              |
| Cameroon                 | 0.93                            |           |         |                         |                    |
| Cape Verde               | 0.61                            |           |         |                         |                    |
| Central African Republic | 0.32                            |           |         |                         |                    |
| Chad                     | 0.85                            |           |         |                         |                    |
|                          |                                 | Chile     | 80-91   | 5.6                     |                    |
| Chile                    | 0.005                           |           | 91-05   | -2.2                    | -0.002             |
|                          |                                 | China     | 86-91   | 1.51                    |                    |
| China                    | 0.009                           |           | 91-03   | 8.04                    | 0.001              |
| Colombia                 | 14.16                           | Colombia  | 2002-04 | 5.31                    | 2.67               |
| Comoros                  | 1.96                            |           |         |                         |                    |
| Congo                    | 0.67                            |           |         |                         |                    |
| Congo, Democratic        | 0.49                            |           |         |                         |                    |

|                                  |       |              |         |        |       |
|----------------------------------|-------|--------------|---------|--------|-------|
| Republic of                      |       |              |         |        |       |
|                                  |       | Costa Rica   | 80-91   | 2.87   |       |
| Costa Rica                       | 0.2   |              | 91-05   | 4.74   | 0.04  |
| Côte d'Ivoire                    | 0.28  |              |         |        |       |
| Ecuador                          |       | Ecuador      | 95-04   | -8.45  |       |
|                                  |       | Egypt        | 82-91   | -5.37  |       |
| Egypt                            | 0.15  |              | 91-03   | 2.88   | 0.05  |
|                                  |       | El Salvador  | 80-91   | -13.96 |       |
| El Salvador                      | 0.23  |              | 91-05   | 2.56   | 0.09  |
| Equatorial Guinea                | 0.47  |              |         |        |       |
| Eritrea                          | 0.42  |              |         |        |       |
| Ethiopia                         | 6.49  |              |         |        |       |
| Gabon                            | 0.97  |              |         |        |       |
| Gambia                           | 1.34  | Gambia       | 93-99   | -3.84  | -0.35 |
| Ghana                            | 2.09  | Ghana        | 83-91   | 13.56  | 0.15  |
|                                  |       | Guatemala    | 84-91   | -6.95  |       |
| Guatemala                        | 0.87  |              | 91-02   | 2.24   | 0.39  |
|                                  |       | Guinea       | 87-91   | 18.95  |       |
| Guinea                           | 0.77  |              | 91-96   | 3.84   | 0.20  |
| Guinea-Bissau                    | 0.52  |              |         |        |       |
| Honduras                         | 0.74  |              |         |        |       |
|                                  |       | Hong Kong    | 81-91   | 5.07   |       |
|                                  |       |              | 91-05   | 0.88   |       |
|                                  |       | India        | 80-91   | -3.5   |       |
| India                            | 0.52  |              | 91-03   | -4.31  | -0.12 |
|                                  |       |              |         |        |       |
| Indonesia                        | 0.50  | Indonesia    | 95-01   | 2.06   | 0.24  |
|                                  |       | Kenya        | 80-91   | -1.07  |       |
| Kenya                            | 1.46  |              | 91-97   | -9.61  | -0.15 |
| Korea, Republic of               | 0.014 | Korea, (Re)  | 93-05   | 4.25   | 0.003 |
| Lao People's Democratic Republic | 3.42  |              |         |        |       |
| Lesotho                          | 0.204 | Macau, China | 98-05   | 4.65   | 0.04  |
| Madagascar                       | 1.55  |              |         |        |       |
| Malawi                           | 1.11  | Malawi       | 90-94   | -2.35  | -0.47 |
|                                  |       | Malaysia     | 81-91   | 1.81   |       |
| Malaysia                         | 0.204 |              | 91-01   | 4.23   | 0.05  |
| Mali                             | 3     |              |         |        |       |
| Mauritania                       | 1.703 |              |         |        |       |
| Mauritius                        | 0.03  | Mauritius    | 99-05   | 2.02   | 0.01  |
| Mexico                           | 1.5   | Mexico       | 91-04   | -0.93  | -1.61 |
| Mongolia                         | 0.05  | Mongolia     | 2000-05 | 2.96   | 0.02  |
| Morocco                          | 0.54  |              |         |        |       |
| Mozambique                       | 0.65  |              |         |        |       |
| Namibia                          | 2.72  |              |         |        |       |
| Nepal                            | 15.69 |              |         |        |       |



|                              |        |              |         |        |        |
|------------------------------|--------|--------------|---------|--------|--------|
| Nicaragua                    | 2.88   | Nicaragua    | 2003-04 | -8.01  | -0.36  |
| Niger                        | 1.28   |              |         |        |        |
| Nigeria                      | 2.13   |              |         |        |        |
|                              |        | Pakistan     | 82-90   | 4.66   |        |
| Pakistan                     | 1.16   |              | 93-02   | 0.25   | 4.64   |
| Panama                       | 0.56   | Panama       | 2003-05 | 11.28  | 0.05   |
| Paraguay                     | -1.26  | Paraguay     | 2000-03 | -8.54  | 0.15   |
| Peru                         | 0.08   | Peru         | 95-05   | -1.44  | -0.05  |
| Philippines                  | 0.53   | Philippines  | 2001-04 | -3.06  | -0.17  |
| Rwanda                       | 1.17   | Rwanda       | 96-97   | -10.54 | -0.11  |
| Senegal                      | 0.79   |              |         |        |        |
|                              |        | Seychelles   | 86-91   | -0.01  |        |
|                              |        |              | 91-04   | 0.21   |        |
| Singapore                    | 0.048  | Singapore    | 86-91   | 7.41   | 0.01   |
|                              |        |              | 91-05   | 4.72   |        |
| South Africa                 | 12.43  | South Africa | 90-02   | 1.18   | 10.54  |
|                              |        | Sri Lanka    | 80-91   | 1.01   |        |
| Sri Lanka                    | 0.402  |              | 91-05   | -0.02  | -20.10 |
|                              |        | St. Helena   | 94-02   | 3.35   |        |
| Sudan                        | 0.78   | Sudan        | 88-92   | -33.85 | -0.02  |
| Swaziland                    | 0.504  |              |         |        |        |
| Tanzania, United Republic of | 0.735  |              |         |        |        |
|                              |        | Thailand     | 89-91   | 4.73   |        |
| Thailand                     | 0.36   |              | 91-03   | 1.07   | 0.34   |
| Togo                         | 0.84   |              |         |        |        |
| Tunisia                      | 1.59   |              |         |        |        |
| Uganda                       | 0.415  |              |         |        |        |
|                              |        | Uruguay      | 84-91   | 2.38   |        |
| Uruguay                      | 6.65   |              | 91-99   | -2.62  | -2.54  |
| Venezuela                    | -0.033 |              |         |        |        |
| Viet Nam                     | 1.68   |              |         |        |        |
| Zambia                       | 0.86   |              |         |        |        |
| Zimbabwe                     | 0.21   | Zimbabwe     | 95-01   | -2.16  | -0.10  |

Note: (1) Industry refers to manufacturing and other allied activities. (2) Growth rates are based on real manufacturing wage indices. The base year varies from country to country. (3) Wage Elasticity of Employment is defined as the ratio of employment growth to wage growth.

Source: Based on KILM data, ILO.

Next we attempt to analyse the elasticity of employment and wages to estimate its impact on labour productivity and real wages in manufacturing sector. Wage elasticity of employment computed as the ratio of the rate of growth of employment to the rate of growth of wages. For

this purpose, we utilized the UNIDO data<sup>5</sup> for the manufacturing sector. We present this ratio in Table 2, which turns out to be negative in a number of countries<sup>6</sup>, (Table 2). However, it is high (i.e., more than -0.5) only in India, Senegal, Vietnam and Bangladesh and Botswana (in descending order of magnitude). Econometric estimation of elasticity of employment with respect to wages also confirms a high magnitude with a negative sign only in the case of Brazil, Japan<sup>7</sup>, Macau, Madagascar, Malaysia, Mauritius and Philippines (see Table A in the Appendix). Hence, UNIDO data like the KILM data do not provide any significant evidence on the basis of which the argument for employment expansion through wage reduction can be built strongly.

**Table 2: Elasticity of Employment w. r. to Wages and Wage-Productivity Links in Manufacturing Sector (UNIDO Data, 1990-2004)**

| period  | Country    | Emp. Elas. w. r. to Growth | Emp. Elas. w. r. to Wages | Rate of Growth of Lab. Prod | Rate of Growth of Real Wages | Elas. Of Wages w. r. to Lab. Prod. |
|---------|------------|----------------------------|---------------------------|-----------------------------|------------------------------|------------------------------------|
| 1993-02 | Argentina  | 0.09                       | 0.11                      | -10.07                      | -8.90                        | 0.88<br>(0.98)*                    |
| 1995-98 | Bangladesh | -1.23                      | -0.62                     | -12.39                      | -10.97                       | 0.89                               |
| 1995-   | Bolivia    | 0.10                       | 0.75                      | -6.81                       | -0.96                        | 0.14                               |

<sup>5</sup>For the manufacturing sector information on employment, value added, wages and salaries and gross fixed capital formation have been compiled by UNIDO. The INDSTAT4 2007 ISIC Rev.3 database reports time series data for currently 113 countries. From this we picked up those which fall into the South and East Asian regions, African and Latin American countries for the period starting from 1990 to 2004. The nominal variables are available both in terms of national currency and US dollars. We preferred the later as it would make international comparison easier. The time series of nominal variables reflect (a) the effect of exchange rate fluctuations, (b) price movements in respective countries and (c) the real changes. UNIDO used the average period exchange rates as given in the International Financial Statistics to convert the series in dollar terms. This way the effect of changes in the exchange rate are neutralised. As far as the country specific price inflations are concerned we have taken the GDP deflators from the World Development Indicators. Since different countries have different bases we have tried to convert the series of GDP deflators with respect to a common base for all the countries (1990) though this has not been possible for some of the countries which started the series at a later date. The GDP deflators have been used to neutralise the price effect in the series of nominal variables. The deflated wage bill has been divided by the total number of employees to work out the real wage rate. Needless to add that information on all the variables are not reported for each of the years. For some of the countries only one or two variables and that too for only a few years this information is available. Hence, the computation of growth rate of a particular variable does not necessarily reflect the movement from 1990 through 2004.

<sup>6</sup>India, Senegal, Vietnam, Bangladesh, Botswana, Panama, Peru, Malaysia, Ethiopia, Brazil, Mexico, Singapore, Mauritius and Uruguay.

<sup>7</sup>Japan has been included though it is not a developing country.

|         |                 |       |       |        |        |                  |
|---------|-----------------|-------|-------|--------|--------|------------------|
| 01      |                 |       |       |        |        | (0.14)**         |
| 1995-04 | Botswana        | -1.62 | -0.52 | -8.01  | -9.60  | 1.20             |
| 1996-04 | Brazil          | -0.29 | -0.16 | -13.31 | -18.65 | 1.40<br>(1.39)*  |
| 1993-00 | Cambodia        | 0.98  | 5.39  | 1.23   | 9.31   | 7.56<br>(0.52)   |
| 1995-04 | Ecuador         | 0.63  | 0.90  | 1.70   | 3.18   | 1.87<br>(-0.06)  |
| 1990-04 | Ethiopia        | -0.64 | -0.23 | -4.18  | -7.09  | 1.69<br>(1.26)*  |
| 1992-04 | Eritrea         | 0.01  | 0.01  | -11.74 | -9.99  | 0.85<br>(0.81)*  |
| 1998-03 | India           | -3.23 | -2.58 | 1.15   | 0.34   | 0.30<br>(0.22)   |
| 1998-03 | Indonesia       | 0.21  | 0.15  | 3.33   | 6.09   | 1.83<br>(0.61)   |
| 1994-02 | Japan           | 0.82  | 2.76  | -0.66  | -1.12  | 1.69<br>(0.91)*  |
| 1990-02 | Korea, Re       | 2.17  | 0.82  | 0.74   | -1.68  | -2.27<br>(0.93)* |
| 1997-04 | Macau,<br>China | 0.18  | 0.45  | -3.51  | -1.72  | 0.49<br>(0.44)*  |
| 1998-03 | Madagascar      | -0.43 | 5.36  | 54.78  | -3.08  | -0.06<br>(1.18)* |
| 1999-01 | Malawi          | 0.16  | 0.24  | -30.41 | -24.04 | 0.79<br>(0.80)*  |
| 2001-03 | Malaysia        | -0.18 | -0.30 | 4.67   | 2.32   | 0.50<br>(0.47)   |
| 1997-03 | Mauritius       | -0.10 | -0.07 | -3.66  | -4.98  | 1.36<br>(1.06)*  |
| 1994-00 | Mexico          | -0.16 | -0.13 | -13.74 | -14.93 | 1.09<br>(1.22)*  |
| 1992-00 | Mongolia        | 0.69  | 5.46  | -1.93  | -0.79  | 0.41<br>(0.25)   |
| 2000-04 | Morocco         | 0.25  | 0.20  | 4.09   | 6.93   | 1.70<br>(1.63)*  |
| 1996-02 | Nepal           | 0.40  | 0.79  | -2.38  | -2.02  | 0.85             |
| 1992-01 | Panama          | -0.32 | -0.40 | -5.67  | -3.44  | 0.61<br>(0.27)   |
| 1995-96 | Peru            | -1.41 | -0.40 | -6.93  | -10.11 | 1.46             |
| 1996-03 | Philippines     | 0.16  | 0.21  | -10.80 | -9.69  | 0.90<br>(0.92)*  |
| 1998-02 | Senegal         | -0.63 | -2.04 | -9.84  | -1.87  | 0.19<br>(0.37)*  |
| 1991-03 | Singapore       | -0.23 | -0.11 | 1.93   | 3.21   | 1.66<br>(0.71)*  |

|         |              |       |       |        |        |                 |
|---------|--------------|-------|-------|--------|--------|-----------------|
| 1998-04 | Vietnam      | 0.84  | -1.59 | 3.73   | -12.20 | -3.27           |
| 1991-04 | South Africa | 0.23  | 0.11  | -5.66  | -15.93 | 2.81<br>(1.06)  |
| 1996-00 | Thailand     | 0.06  | 0.11  | -19.54 | -11.01 | 0.56<br>(0.66)* |
| 1998-03 | Uruguay      | -0.07 | -0.06 | -57.22 | -63.78 | 1.11<br>(1.07)* |

Note: Figures in parentheses in the last column give the econometric estimates of elasticity of wages with respect to labour productivity. \* and \*\* represent significance at 5 and 10 per cent levels respectively.

Source: Based on UNIDO data.

In the related literature effects of productivity growth on wage and employment is a debatable issue (e.g., see Phelps 1994, Blanchard and Wolfers, 2000, Krueger and Solow, 2002 and Pissarides, 2000). Considering the contrary evidence on the issue, next we take pose the question how much of productivity growth actually gets transferred to the workers. In the neoclassical framework the benefits of productivity growth gets shared between the entrepreneurs and the employees.

To analyse the issue, using the KLIM data, we estimate the elasticity of wage with respect to productivity in manufacturing for a set of developing countries. Interestingly, the elasticity turns out to be positive only in China and Korea during the nineties (Table 3). In Brazil and India it is negative during the same period, suggesting no transfer of benefits to the workers. However, this coefficient could be estimated only for a few countries and hence, it may not be appropriate to deduce any strong conclusion. We, therefore, turn to the UNIDO data. The elasticity of wage with respect to labour productivity as given in Table 2 for the manufacturing sector is positive and high in a number of countries with a few exceptions: Bolivia, Senegal, India, Mongolia and Macau and Malaysia, where elasticity is less than 0.5. Econometric estimation also conforms to this pattern as a large number of countries reveal strong links between labour productivity and wage. This would possibly indicate that labour is already able to get its due share in a number of countries. However, before concluding in

this direction we need to carry out country and industry specific detailed analysis which is attempted for India as a case study in section 4.

**Table 3: Rate of Growth of Labour Productivity and Elasticity of Wage w. r. to Productivity in Manufacturing (KILM Data)**

| Country       | Period | Rog of Lab. Prod. in Mfg (2) | Elasticity of Mfg Wage w. r. to Lab Prod. |
|---------------|--------|------------------------------|---|
| Brazil        | 80-91  | -2.92                        |   |
|               | 91-04  | 1.44                         | -2.62<br>(1994-02, N=9, -1.68**)          |
| China         | 80-91  | 4.82                         | 0.31                                      |
|               | 91-05  | 10.15                        | 0.79<br>(1990-03, N=14, 0.71*)            |
| India         | 80-91  | 3.75                         | -0.93                                     |
|               | 91-05  | 3.02                         | -1.43<br>(1990-03, N=14, -2.04*)          |
| Indonesia     | 80-91  | 4.07                         | 0.51                                      |
|               | 91-05  | 2.43                         | (1995-01, N=7, 0.52)                      |
| Korea, Rep    | 80-91  | 5.35                         | 0.79                                      |
|               | 91-05  | 8.19                         | (1993-05, N= 13, 0.52*)                   |
| Mexico        | 80-91  | -0.33                        | 2.82                                      |
|               | 91-05  | 1.99                         | (1991-04, N=12, -0.66)                    |
| Taiwan, China | 80-91  | 5.09                         |   |
|               | 91-05  | 3.05                         |   |

Note: (1) Growth rate of labour productivity is calculated from GDP per person employed (1997 US\$, at PPP) in the manufacturing sector with 1980 as the base for the index. (2) The base year for real manufacturing wage indices are as follows: Brazil, 1996; China, 2000; India, 2000; Indonesia, 2000; Korea, 2000; Mexico, 2000. (3) Figures in the last column within the parentheses are based on econometric estimation. The period over which the estimation has been done, the number of observations (N) used, and the elasticity figures are shown within the brackets. \* and \*\* represent significance at 5 and 10 per cent levels respectively.

Source: Based on KILM Data, ILO.

### 3. Labour Market Deregulation and Employment

Those who support labour market deregulation believe that the cost of labour is too high. In the context of globalisation firms need to become more competitive by cutting cost, and high labour cost is thought to be one of the major sources of inefficiency (see e.g. Slaughter and Swagel, 1997). Labour rules and strong unions are believed to push the wage rate artificially much above the market clearing wage rate which in turn suppresses employment. Hence, labour market deregulation is expected to reverse the attitude of the employers against

expanding employment since it empowers them to hire and fire labour as per requirement and offer wages which allow product prices to remain competitive.

With this viewpoint, we are set to analyse the cost of labour in production in order to evaluate the case of labour market deregulation. For this purpose, based on the UNIDO data, we measure the average labour cost (real wage rate multiplied by total employment) as a percentage of real value added for the period 1990- 2004 in the manufacturing sector for a set of developing countries. Surprisingly, 36 countries for which this ratio could be calculated only eight countries have the labour cost more than 35 per cent (see Table 4). To begin with, high cost of labour argument, therefore, does not seem to have a strong basis to build a case for labour market deregulation. Therefore, these findings corroborate the argument of Gorter and Poot, (1999) that the benefits of labour market deregulation should not be exaggerated

**Table 4: Average Labour Cost as a Percentage of Real Value Added in Manufacturing**

| Country     | Labour Cost (%) | Country    | Labour Cost (%) | Country      | Labour Cost (%) |
|-------------|-----------------|------------|-----------------|--------------|-----------------|
| Ecuador     | 12.49           | Bangladesh | 22.01           | Vietnam      | 30.68           |
| Sudan       | 13.34           | Rwanda     | 23.08           | Mongolia     | 30.71           |
| Colombia    | 14.39           | Cambodia   | 23.34           | Uruguay      | 30.80           |
| Bolivia     | 14.63           | Korea, Re  | 23.71           | Gambia       | 31.16           |
| Philippines | 17.11           | Zimbabwe   | 23.73           | Singapore    | 34.06           |
| Indonesia   | 17.37           | Brazil     | 24.34           | Argentina    | 35.01           |
| Ghana       | 17.87           | Malaysia   | 24.58           | Senegal      | 35.19           |
| Peru        | 18.37           | India      | 24.73           | Egypt        | 35.42           |
| Eritrea     | 18.65           | Madagascar | 25.11           | Panama       | 36.70           |
| Nepal       | 18.75           | Botswana   | 25.96           | Morocco      | 39.93           |
| Mexico      | 18.79           | Japan      | 27.73           | South Africa | 41.11           |
| Ethiopia    | 19.10           | Thailand   | 29.03           | Mauritius    | 44.40           |
|             |                 | Malawi     | 29.24           | Macau, China | 60.72           |

Source: Based on UNIDO Data.

Next, we examine if there is any connection between labour absorption in manufacturing sector and labour market regulation across countries<sup>8</sup>. World Development Indicators report the percentage of managers indicating labour regulations (LABREG) as a major business constraint and the percentage of manager indicating labour skill as a major business constraint (LABSKILL) for various countries. Higher is the percentage, higher is the probability that labour market regulations and skill factor affect employment adversely. We have tried to relate these skill and regulation specific responses to the ratio of labour to real value added (LTORVA) estimated from UNIDO data for the aggregate manufacturing sector. The coefficients in the estimated equations, however, turn out to be highly insignificant (Table 5). Even when we control for real wage rate in the manufacturing sector (RWAGE), GDP per capita (GDPPC) at the national level and the share of manufactures in total imports (MFGIM) taken as a proxy for imported technology, neither the labour skill variable nor labour market regulation turns out to be significant. Alternate estimate of labour absorption (or dependent variable) have been tried in the equation, i.e. the rate of growth of employment (ROGEMFG) in the manufacturing sector from UNIDO data. Interestingly the skill factor is seen to affect employment growth in the manufacturing sector negatively. In other words, higher is the percentage of managers who feel skill has been affecting business adversely, lower is the rate of growth of employment in the manufacturing sector. This implies that poor skill base of the work force in the developing countries reduces the pace of labour absorption as labour demand is possibly rising only for the high skilled variety. However, the effect of the labour market regulation is not statistically significant on the alternate form of the dependant variable. Though the sample is quite small, at least this much is evident that labour market regulations do not retard labour absorption.

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<sup>8</sup> Berg and Cazes (2007) point out the serious conceptual and methodological problems associated with the World Bank's Employing Workers Index of the Doing Business indicators and risks of formulating policies on the basis of these indicators.

ILO's data on the percentage of workers registered with the unions has also been tried as a proxy for labour market condition<sup>9</sup>. Interestingly higher is the percentage of work force registered with unions (WFUIN) higher is the ratio of labour to real value added in the manufacturing sector. This is, however, based only on 13 observations and, therefore, needs to be cited with caution (Table 5)

**Table 5: Employment, Skill and Regulations: Regression Results**

| Variable            | Dep.Var.<br>LTORVA    | Dep. Var.<br>LTORVA   | Dep. Var.<br>LTORVA   | Dep. Var.<br>ROGEMFG |
|---------------------|-----------------------|-----------------------|-----------------------|----------------------|
| LABSKILL            | 0.00004<br>(0.83)     |                       |                       | -0.47<br>(-1.93)**   |
| LABREG              |                       | -0.00001<br>(-0.25)   |                       |                      |
| REALW               | -1.24e-06<br>(-2.08)* | -1.74e-06<br>(-2.53)* | -1.02e-09<br>(-2.41)* |                      |
| GDPPC               | 1.29e-06<br>(3.05)*   | 8.52e-07<br>(1.83)**  |                       |                      |
| MFGIM               | -0.0001<br>(-2.56)*   | -0.0001<br>(-1.65)    |                       |                      |
| WFUIN               |                       |                       | 2.06e-06<br>(13.07)*  |                      |
| INTER               | 0.01<br>(2.70)*       |                       | -7.03e-06<br>(-0.45)  | 14.30<br>(2.60)*     |
| Adj. R <sup>2</sup> | 0.40                  | 0.23                  | 0.98                  | 0.11                 |
| N                   | 22                    | 24                    | 13                    | 22                   |

Note: N stands for the number of observations. \* and \*\* represent significance at 5 and 10 per cent levels respectively.

Source: Based on data from UNIDO, World Development Indicators and ILO Bureau of Statistics.

#### 4. Evidence from Indian Manufacturing Sector

In this section we focus on an interesting case of India for the analysis. The country has witnessed a set of reforms and Indian manufacturing has been opened to global competition. Despite some serious efforts of globalization, the Indian case is unique as the labour market in the country is dualistic, where a large unorganised sector coexists with the organised sector. There are many regulations (including labour related) in the country is applicable only to

<sup>9</sup>Trade union members as a percentage of total paid employees has been calculated by ILO Bureau of Statistics.



the organised sector and some of these regulations are considered to be especially constraining to the employers leading to rigidities in labour markets.

In order to elaborate some of the labour market issues, we analyse the elasticity of employment with respect to wages and the wage-productivity nexus, using the state level data in India for different groups of industries. Keeping in view the wide divergence in the industrialisation experience of the Indian states this exercise has been undertaken so that generalisation to some extent can be pursued. Based on the panel data for the Indian states over the period 1979-80 through 1997-98 employment elasticity with respect to wages and value added has been estimated for each of the two digit manufacturing industry groups and the aggregate manufacturing in the organised or formal sector<sup>10</sup>. The following functions have been used to estimate the elasticity coefficients:

$$\ln EMP = f(\ln VA, \ln EML) \dots\dots\dots 1$$

$$\ln EMP = f(\ln VA, \ln EML, \ln MANE) \dots\dots\dots 2$$

where,  $\ln \square$  stands for natural log., EMP for employees, VA for value added, EML for emoluments per employee, and MANE for man days per employee. Given the man days per employee (worker) and emoluments (wages) per worker, increase in value added is expected to raise the labour demand though with adoption of capital-intensive technology rise in employment may not be significant. Labour demand is expected to vary inversely with wages. On the other hand, given the value added and wages per worker, any rise in the number of man days per worker may actually reduce the number of workers<sup>11</sup>.

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<sup>10</sup>We may refer to it as ASI-sector or the component of the manufacturing sector which is covered by the Annual Survey of Industries. More recent years could not be included in the analysis as the comparability problem between NIC, 1998 and NIC, 1987 is quite serious, particularly at the state level. The value added figures have been deflated by the wholesale price index of the corresponding industrial group. The wages are deflated by the consumer price index of the industrial workers corresponding to different states.

<sup>11</sup>Nagaraj (1994) and Balhotra (1998) noted that the growth in man days per worker was the cause of stagnation in employment in the eighties. Goldar (2000), however, did not find this variable to be significant.

The slope dummy with respect to value added has been introduced for the years, 1991-92 to 1997-98, to examine if the reforms changed the employment elasticity of growth. This equation has been estimated for each of the industry groups including the aggregate manufacturing sector, based on the panel data across fourteen major states. However, it is not uniformly a balanced panel across each of the industry groups.<sup>12</sup>

Tables 6 reports the results of the employment functions estimated in reference to total employees, which include workers as well as educated and skilled staff. Gross value added is an important determinant of employment across all the two digit industry groups and at the aggregate level of manufacturing sector too. Except wood (27), paper (28), leather (29), non-metallic minerals (32), basic metal (33), metal products (34), transport equipment (37) and other manufacturing (38) and the aggregate manufacturing the estimates are indicative of a change in the employment elasticity of growth during the nineties compared to the eighties. Only in the case of cotton textile (23), wool, silk etc. (24) and jute (25) the employment elasticity declined in the reform period and in the rest of the industry groups it showed signs of improvement compared to the eighties. However, the extent of change is only nominal and in general the employment elasticity of growth turns out to be much below unity: only in jute (25) and textile (26) the employment elasticity has been above 0.7 and 0.6 respectively whereas at the aggregate level it turns out to be only around 0.35. By and large similar patterns are noted when we estimated the employment function by replacing the employees by workers.<sup>13</sup>

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<sup>12</sup>It may be noted that at the state level the figures corresponding to each of the industry groups have not been stated explicitly for some of the years, i.e., two industry groups have been merged at times. In such cases, on the basis of the information for the previous or the succeeding year an attempt has been made to separate out the figures. However, for some of the years even this approximation could not be carried out; hence those years had to be dropped.

<sup>13</sup> However, the results from the panel data used in our analysis, are expected to capture much larger variations than what a pure time series or cross-sectional data set can, and hence, from this point of view the estimates based on panel data may assume greater reliability.

Though the employment elasticity with respect to emoluments per employee is significant in a large number of two-digit industry groups, the magnitude is not very high except in food (20-21), beverages (22), jute (25), textile (26), paper (28), non-metallic mineral (32) and other manufacturing (38), where it turns out to be at least around 0.5 in one of the two alternative specifications (with and without man-days per employee). At the aggregate level the wage elasticity of employment is estimated at only 0.24.

Is not then economic policy over-stretching the wage rigidity argument? As the empirical results show, reduction in wage rates cannot bring in miraculous increase in employment<sup>14</sup>. Besides, labour market flexibility in terms of the changes in the mode of employment, i.e., from regular wage employment to contractual, casual and piece rate employment, has serious implications in terms of the social costs and welfare losses (see Uchikawa, 2003, Datta, 2003, Dutt, 2003, Hasan, Mitra and Ramaswamy, 2003).

**Table 6: Employment Function (Total Employees)**

| Ind.  | LnVA             | DLnVA              | LnEML              | LnMANE            | Adj. R <sup>2</sup> | Model | N   |
|-------|------------------|--------------------|--------------------|-------------------|---------------------|-------|-----|
| 20-21 | 0.32<br>(12.03)* | 0.005<br>(4.35)*   | -0.18<br>(-2.30)*  | -0.74<br>(-7.44)* | 0.98                | FE    | 252 |
|       | 0.30<br>(10.19)* | 0.008<br>(6.19)*   | -0.65<br>(-14.33)* |                   | 0.97                | FE    | 266 |
| 22    | 0.30<br>(10.13)* | 0.01<br>(6.50)*    | -0.58<br>(-7.98)*  | -0.14<br>(-0.97)  | 0.97                | FE    | 251 |
|       | 0.31<br>(10.50)* | 0.01<br>(6.72)*    | -0.67<br>(-10.20)* |                   | 0.97                | FE    | 265 |
| 23    | 0.33<br>(10.26)* | -0.005<br>(-4.47)* | -0.35<br>(-2.75)*  | 0.006<br>(0.03)   | 0.97                | FE    | 252 |
|       | 0.31<br>(10.13)* | -0.005<br>(-4.64)* | -0.31<br>(-2.74)*  |                   | 0.97                | FE    | 266 |
| 24    | 0.23<br>(7.82)*  | -0.005<br>(-2.29)* | 0.27<br>(2.88)*    | -0.28<br>(-1.08)  | 0.96                | FE    | 239 |
|       | 0.32<br>(10.20)* | -0.009<br>(-3.72)* | -0.02<br>(-0.21)   |                   | 0.96                | FE    | 253 |
| 25    | 0.74<br>(23.62)* | -0.004<br>(-1.25)  | -0.77<br>(-5.30)*  | 0.80<br>(3.59)*   | 0.98                | FE    | 192 |
|       | 0.76<br>(25.07)* | -0.007<br>(-2.19)* | -0.32<br>(-3.70)*  |                   | 0.98                | FE    | 206 |

<sup>14</sup>Besley and Burgess (2004) meticulously examined if labor regulation can hinder economic performance.

|       |                  |                     |                    |                   |      |    |     |
|-------|------------------|---------------------|--------------------|-------------------|------|----|-----|
| 26    | 0.60<br>(17.85)* | 0.005<br>(1.86)**   | -0.46<br>(-4.02)*  | -0.48<br>(-1.25)  | 0.95 | FE | 249 |
|       | 0.64<br>(19.90)* | 0.004<br>(1.47)     | -0.53<br>(-5.04)*  |                   | 0.95 | FE | 265 |
| 27    | 0.41<br>(13.58)* | 0.002<br>(1.17)     | -0.32<br>(-3.25)*  | -0.31<br>(-1.32)  | 0.95 | FE | 252 |
|       | 0.45<br>(14.81)* | 0.003<br>(1.42)     | -0.38<br>(-4.13)*  |                   | 0.94 | FE | 266 |
| 28    | 0.37<br>(12.43)* | -0.0003<br>(-0.183) | -0.30<br>(-3.20)*  | -0.81<br>(-3.64)* | 0.95 | FE | 252 |
|       | 0.36<br>(12.23)* | 0.002<br>(1.60)     | -0.51<br>(-6.13)*  |                   | 0.95 | FE | 266 |
| 29    | 0.44<br>(13.09)* | 0.003<br>(1.02)     | -0.23<br>(-1.64)   | -0.47<br>(-2.37)* | 0.95 | FE | 245 |
|       | 0.45<br>(14.21)* | 0.003<br>(1.02)     | -0.35<br>(-2.59)*  |                   | 0.95 | FE | 258 |
| 30    | 0.19<br>(7.58)*  | 0.004<br>(2.90)*    | -0.03<br>(-0.396)  | -0.34<br>(-2.18)* | 0.97 | FE | 249 |
|       | 0.18<br>(7.17)*  | 0.005<br>(3.48)*    | -0.12<br>(-1.59)   |                   | 0.97 | FE | 262 |
| 31    | 0.36<br>(12.15)* | 0.01<br>(5.18)*     | 0.26<br>(2.04)*    | -0.92<br>(-5.33)* | 0.93 | FE | 249 |
|       | 0.40<br>(13.85)* | 0.01<br>(5.53)*     | -0.21<br>(-2.22)*  |                   | 0.92 | FE | 262 |
| 32    | 0.30<br>(12.42)* | 0.001<br>(0.97)     | -0.38<br>(-5.24)*  | -0.15<br>(-3.04)* | 0.86 | FE | 252 |
|       | 0.31<br>(12.56)* | 0.001<br>(0.86)     | -0.48<br>(-6.83)*  |                   | 0.97 | FE | 265 |
| 33    | 0.18<br>(6.36)*  | 0.0006<br>(0.41)    | -0.037<br>(-0.37)  | -0.37<br>(-2.02)* | 0.96 | FE | 252 |
|       | 0.18<br>(7.04)*  | 0.001<br>(0.96)     | -0.15<br>(-1.92)** |                   | 0.95 | FE | 266 |
| 34    | 0.44<br>(13.57)* | -0.0002<br>(-0.14)  | 0.23<br>(2.66)*    | -0.69<br>(-2.55)* | 0.97 | FE | 252 |
|       | 0.44<br>(13.88)* | -0.0003<br>(-0.26)  | 0.13<br>(1.69)**   |                   | 0.97 | FE | 266 |
| 35-36 | 0.33<br>(12.92)* | 0.003<br>(3.19)*    | -0.18<br>(-2.74)*  | -0.18<br>(-1.14)  | 0.99 | FE | 228 |
|       | 0.38<br>(14.85)* | 0.0003<br>(0.44)    | -0.26<br>(-3.85)*  |                   | 0.99 | FE | 266 |
| 37    | 0.22<br>(8.23)*  | -0.002<br>(1.26)    | 0.14<br>(1.26)     | -1.22<br>(-4.72)* | 0.98 | FE | 251 |
|       | 0.24<br>(8.80)*  | -0.002<br>(-0.89)   | -0.12<br>(-1.15)   |                   | 0.98 | FE | 265 |
| 38    | 0.35<br>(12.00)* | 0.001<br>(0.50)     | 0.02<br>(0.23)     | -0.51<br>(-1.96)* | 0.97 | FE | 251 |
|       | 0.37<br>(13.28)* | 0.15<br>(0.67)      | -0.75<br>(-0.90)   |                   | 0.97 | FE | 265 |
| Agg.  | 0.35             | -0.0001             | -0.24              | -0.63             | 0.98 | FE | 252 |

|              |                  |                 |                  |          |      |    |     |
|--------------|------------------|-----------------|------------------|----------|------|----|-----|
| Mfg<br>(ASI) | (11.54)*         | (-0.18)         | (-3.26)*         | (-4.26)* |      |    |     |
|              | 0.37<br>(13.28)* | 0.001<br>(0.67) | -0.07<br>(-0.90) |          | 0.97 | FE | 265 |

Note: N stands for the number of observations and \* and \*\* for 5 and 10 per cent levels of significance. FE represents Fixed Effect Model, RE Random Effect Model and CR Classical Regression Model. Based on the Lagrange Multiplier statistic and the Hausman statistic the appropriateness of the model is chosen.

The other exercise tried in the analysis relates to wage per worker function. The main motivation to carry out this exercise is to examine the effect of labour productivity on wages along the line of neoclassical argument:

$$\ln WAG = G(\ln GVEM, D\ln GVEM, \ln CAPEM) \dots\dots\dots 3$$

$$\ln WAG = f(\ln GVEM, D\ln GVEM, \ln CAPEM, \ln MANW) \dots\dots\dots 4$$

where, ln is the log transformation, WAG is the wage per worker, GVEM is gross value added per employee, and CAPEM is the capital per employee ratio<sup>15</sup>. Wage per worker is taken as a function of productivity and capital-employee ratio. To allow for the change in the effect of labour productivity on wage in the nineties relative to the eighties the slope dummy DlnGVEM has been introduced. Higher levels of productivity are likely to raise the wages, as part of the productivity gains may be transferred to the workers. The sources of productivity rise are rise in capital intensity, technological change or improved organization efficiency (see Tendulkar, 2000). If higher levels of capital-labour ratio are indicative of a mere rise in capital intensity and not technological improvement, this may reduce labour demand and thus wages. However, if higher levels of capital-labour ratio reflect higher levels of technology, suggesting improved performance of labour, wages may then actually increase. In an alternative specification man-days per worker (lnMANW) has also been introduced hypothesizing that with a rise in the man days per worker wage per worker would go up. If labour is used on part time or piece rate basis higher levels of man days per worker would mean more work opportunities and hence, earnings are expected to increase. In the context of

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<sup>15</sup> The nominal values of capital have been deflated by the combined price index of machinery and metal products.

labour market reforms with larger possibilities of recruiting workers on part time and piece rate basis, this variable is expected to be of great importance. Even for the full-time workers the provision for over-time remuneration would cause a positive effect of man-days per worker on wages per worker. Only when for the full time workers there exists no scope for over-time payment, rise in man-days per worker cannot make any impact on wages per worker. If full-time workers are under-utilized, strict work conditions in terms of more intensive utilization of work force may also raise the man days per worker, but this will not enhance earnings. On the other hand, when full-time workers are utilized to the full extent, rise in man days per worker can result in rise in over time employment and thus over time payment.

As shown in Table 7, productivity is a significant determinant of wages per worker across a large number of two digit industry groups. However, the partial elasticity of wage with respect to productivity for the aggregate manufacturing sector turns out to be 0.27 and 0.19 depending upon whether man days per worker is or is not included in the function, suggesting that only a small fraction of productivity gains is transferred to workers in terms of wage benefits. Except wool (24), jute (25), textile (26) and basic metal (33) in the rest of the industry groups the effect of productivity on wage rose in the reform period compared to the pre-reform period, as the coefficient of the slope dummy turns out to be significant. However, the magnitude of rise is only nominal. At the aggregate level, for example, it increased by 0.008 point.

Capital-employee ratio reveals a mixed picture: it raised wages in a number of industries while it affected wages adversely or remained insignificant in some other, consequently showing an insignificant effect on wages at the aggregate level. Corresponding to the following industry groups food (20-21), beverages (22), wool and silk (24), wood (27), paper (28), rubber (31), non-metallic minerals (32), metal (34), machinery (35-36), transport

equipment (37) the capital-employee ratio reveals a positive effect on wages. Only in cotton textile (23) the effect is seen to be negative and in textile products (26) and basic metal (33) it is positive when man-days per worker is included; otherwise it turns out to be negative with the exclusion of this variable. In the rest of the industry groups the effect is statistically insignificant. On the whole, in a large number of industry groups capital-labour ratio tends to raise wages indicating improved performance of labour with higher levels of capital per head. However, in most of the cases the elasticity of wage with respect to capital-labour ratio turns out to be extremely low except wool and silk etc. (24) and machinery (35-36) where it ranges from 0.11 to 0.13; (also in the case of 20-21 it is 0.21 when man-days per worker is dropped). Finally, man days per worker turns out to be an important determinant of wage in most of the industry groups - except non-metallic minerals (32) and metal products (34). And interestingly the elasticity of wage with respect to man days appears to be around unity except paper (28), leather (29), machinery (35-36) and other manufacturing (38). Man days per worker being a significant determinant of earnings, the decline in the rate of growth of wages in the nineties relative to the eighties might be an outcome of the decline in the rate of growth of man days per worker, which virtually did not grow during the nineties.

**Table 7: Determinants of Wages per Worker**

| Ind. Code | Constant         | LnGVEM           | DLnGVEM           | LnCAPEM           | LnMANW           | Adj. R <sup>2</sup> | Model | N   |
|-----------|------------------|------------------|-------------------|-------------------|------------------|---------------------|-------|-----|
| 20-21     | 1.42<br>(8.10)*  | 0.11<br>(5.04)*  | 0.01<br>(6.97)*   | 0.04<br>(1.65)**  | 1.01<br>(20.18)* | 0.77                | RE    | 252 |
|           | 3.24<br>(12.49)* | 0.33<br>(10.33)* | 0.002<br>(0.65)   | 0.21<br>(5.95)*   |                  | 0.68                | RE    | 266 |
| 22        | 0.82<br>(1.30)   | 0.18<br>(7.48)*  | 0.005<br>(2.03)*  | 0.08<br>(4.31)*   | 0.90<br>(7.70)*  | 0.74                | RE    | 251 |
|           | 5.35<br>(22.41)* | 0.22<br>(8.28)*  | 0.005<br>(1.92)** | 0.11<br>(5.46)*   |                  | 0.63                | RE    | 265 |
| 23        | 4.72<br>(8.11)*  | 0.05<br>(2.30)*  | 0.004<br>(2.46)*  | -0.02<br>(-1.26)  | 0.69<br>(6.65)*  | 0.17                | RE    | 252 |
|           | 8.46<br>(37.09)* | 0.09<br>(3.81)*  | 0.005<br>(2.93)*  | -0.04<br>(-2.19)* |                  | 0.51                | RE    | 266 |
| 24        |                  | 0.05<br>(1.85)** | 0.003<br>(-0.75)  | 0.11<br>(3.98)*   | 0.98<br>(4.10)*  | 0.77                | FE    | 239 |
|           |                  | 0.08             | -0.004            | 0.12              |                  | 0.77                | FE    | 253 |

|           |                   |                  |                   |                    |                  |       |     |     |
|-----------|-------------------|------------------|-------------------|--------------------|------------------|-------|-----|-----|
|           |                   | (2.80)*          | (-1.18)           | (4.49)*            |                  |       |     |     |
| 25        | 0.77<br>(1.30)    | 0.14<br>(4.14)*  | 0.004<br>(1.30)   | 0.20<br>(0.95)     | 1.14<br>(12.45)* | 0.43  | RE  | 192 |
|           | -29.90<br>(-0.34) | 1.42<br>(0.15)   | 0.76<br>(0.67)    | 1.93<br>(0.34)     |                  | -0.01 | OLS | 206 |
| 26        |                   | 0.18<br>(5.92)*  | 0.004<br>(1.16)   | 0.06<br>(2.09)*    | 0.82<br>(3.09)*  | 0.83  | FE  | 249 |
|           | 37.08<br>(0.64)   | 0.147<br>(2.10)* | 1.38<br>(1.60)    | -18.91<br>(-3.05)* |                  | 0.03  | RE  | 265 |
| 27        | -0.83<br>(-0.57)  | 0.13<br>(5.34)*  | 0.01<br>(5.12)*   | 0.04<br>(2.56)*    | 1.35<br>(5.06)*  | 0.48  | RE  | 252 |
|           | 6.58<br>(30.98)*  | 0.15<br>(6.00)*  | 0.01<br>(5.50)*   | 0.05<br>(2.87)*    |                  | 0.33  | RE  | 266 |
| 28        | 4.15<br>(4.43)*   | 0.18<br>(7.42)*  | 0.02<br>(8.05)*   | 0.02<br>(1.32)     | 0.51<br>(2.95)*  | 0.41  | RE  | 252 |
|           | 6.28<br>(24.40)*  | 0.25<br>(11.40)* | 0.01<br>(7.03)*   | 0.04<br>(2.15)*    |                  | 0.43  | RE  | 266 |
| 29        | 4.00<br>(4.17)*   | 0.13<br>(6.36)*  | 0.02<br>(3.86)*   | -0.02<br>(-1.12)   | 0.66<br>(4.0)*   | 0.27  | RE  | 245 |
|           | 0.75<br>(26.89)*  | 0.12<br>(5.98)*  | 0.009<br>(3.52)*  | -0.18<br>(-0.81)   |                  | 0.27  | RE  | 258 |
| 30        | 2.13<br>(3.30)*   | 0.09<br>(3.81)*  | 0.01<br>(5.77)*   | -0.03<br>(-1.60)   | 1.15<br>(10.11)* | 0.36  | RE  | 249 |
|           | 7.99<br>(23.30)*  | 0.14<br>(5.49)*  | 0.01<br>(5.79)*   | -0.02<br>(-0.84)   |                  | 0.17  | RE  | 262 |
| 31        | 1.99<br>(5.79)*   | 0.11<br>(5.54)*  | 0.01<br>(5.40)*   | 0.04<br>(2.36)*    | 0.94<br>(17.84)* | 0.53  | RE  | 249 |
|           | 6.88<br>(23.21)*  | 0.19<br>(6.25)*  | 0.02<br>(5.42)*   | 0.008<br>(0.31)    |                  | 0.34  | RE  | 262 |
| 32        |                   | 0.14<br>(6.48)*  | 0.006<br>(3.62)*  | 0.07<br>(4.65)*    | 0.04<br>(1.17)   | 0.86  | FE  | 252 |
|           |                   | 0.14<br>(7.05)*  | 0.006<br>(3.51)*  | 0.07<br>(5.12)*    |                  | 0.86  | FE  | 265 |
| 33        | 1.08<br>(1.10)    | 0.09<br>(2.99)*  | -0.004<br>(-1.61) | 0.09<br>(3.28)*    | 1.09<br>(6.17)*  | 0.47  | RE  | 252 |
|           |                   | 0.19<br>(7.29)*  | 0.0002<br>(0.17)  | -0.16<br>(-2.74)*  |                  | 0.95  | FE  | 266 |
| 34        | 5.61<br>(8.06)*   | 0.21<br>(5.14)*  | 0.009<br>(3.72)*  | 0.10<br>(3.68)*    | 0.04<br>(0.37)   | 0.42  | RE  | 252 |
|           | 6.10<br>(16.94)*  | 0.18<br>(4.70)*  | 0.01<br>(4.24)*   | 0.1<br>(3.62)*     |                  | 0.42  | RE  | 266 |
| 35-<br>36 | 4.50<br>(5.13)*   | 0.18<br>(5.33)*  | 0.005<br>(2.75)*  | 0.12<br>(3.99)*    | 0.28<br>(1.95)** | 0.45  | RE  | 228 |
|           |                   | 0.17<br>(5.43)*  | 0.004<br>(2.50)*  | 0.13<br>(5.04)*    |                  | 0.86  | FE  | 266 |
| 37        | 3.02<br>(3.14)*   | 0.58<br>(2.93)*  | 0.009<br>(4.97)*  | 0.05<br>(3.08)*    | 0.92<br>(5.35)*  | 0.40  | RE  | 228 |
|           | 8.01<br>(36.30)*  | 0.09<br>(4.24)*  | 0.01<br>(4.74)*   | 0.04<br>(2.53)*    |                  | 0.36  | RE  | 265 |



|      |                |                 |                    |                  |                 |      |    |     |
|------|----------------|-----------------|--------------------|------------------|-----------------|------|----|-----|
| 38   |                | 0.19<br>(7.65)* | 0.006<br>(2.25)*   | -0.03<br>(-1.46) | 0.45<br>(3.09)* | 0.81 | FE | 251 |
|      |                | 0.19<br>(7.54)* | 0.008<br>(2.76)*   | -0.03<br>(-1.18) |                 | 0.79 | FE | 265 |
| Agg. | 0.08<br>(0.11) | 0.27<br>(8.16)* | -0.0006<br>(-0.36) | -0.03<br>(-1.10) | 1.15<br>(7.57)* | 0.62 | RE | 252 |
|      |                | 0.19<br>(7.54)* | 0.008<br>(2.76)*   | -0.03<br>(-1.18) |                 | 0.79 | FE | 265 |

Note: N stands for the number of observations and \* and \*\* for 5 and 10 per cent levels of significance. FE represents Fixed Effect Model, RE Random Effect Model and CR Classical Regression Model. Based on the Lagrange Multiplier statistic and the Hausman statistic the appropriateness of the model is chosen.

On the whole, what we note is that elasticity of employment with respect to wages is quite moderate though much has been talked about labour market deregulation and wage flexibility with a view to expanding employment. In other words, reduction in wages through labour market deregulation does not seem to promise any significant increase in employment. Productivity gains did not get substantially transferred to the workers and there has been a decline in the wage growth during the reform period. However, part of this decline in wage growth might have resulted from sub-contracting, outsourcing, and piece rate payment, which are increasing in response to labour market flexibility. Also, man-days per worker being an important determinant of the wage rate, the stagnancy in the former during the nineties possibly resulted in a decline in the rate of growth of wages compared to the pre-reform period. Wage-productivity linkage exists but the elasticity of wages with respect to productivity is miniscule. However, the only consolation is that the elasticity coefficient did not deteriorate further after the reforms were initiated.

Goldar (2011) argues that employment in India's organised manufacturing sector increased in recent years at the very rapid rate of 7.5% per annum between 2003-04 and 2008- 09. He further rationalizes it in terms of labour market deregulation, contributing to manufacturing employment growth. The value added growth also picked up to a double-digit figure during the same period (13.7 per cent per annum). However, as Nagaraj (2011) argued that the fine print of exemptions and loopholes built into the labour laws provide sufficient flexibilities to

the industrial firms and hence, labour regulations could not be the cause of deceleration in employment growth in the past. By the same logic labour market deregulation, therefore, could not be treated responsible for rapid employment growth in the recent period. He argues that the recent manufacturing employment boom could be merely a recovery of employment lost over the previous nine years. He also points out that the correlation coefficient between employment elasticity and labour reforms index across states is not statistically significant (Nagaraj, 2011). Another way of rationalizing this employment boom could be in terms of regional change in the industrial employment growth. Some of the states which have not been industrialized registered a rapid employment growth rate during the recent period. The states like Chattisgarh, Haryana, Punjab, Goa, Jammu and Kashmir, Himachal Pradesh, Orissa and Uttarakhand witnessed a double-digit employment growth whereas most of them (except Goa) had experienced either a sluggish or negative employment growth in the earlier years (1998-99 through 2003-04).

## **5. Conclusion**

The argument of high cost of labour does not seem to have a strong basis to build a case for labour market deregulation. Based on the UNIDO data the average labour cost as a percentage of real value added over the period 1990 through 2004 has been estimated for the manufacturing sector. Out of the 36 countries for which this ratio could be calculated only eight reported a figure of more than 35 percent. Empirical findings do not favour labour market regulations affecting employment adversely and, hence the arguments for labour market deregulations need to be viewed carefully. Unionisation rather seems to have a favourable effect on labour absorption though the number of observations is very small. Skill factor, however, has shown a negative impact on employment. In other words, higher is the response of the managers, perceiving skill as a major business constraint, lower is the employment growth. All this would tend to suggest that instead of labour market deregulation

focus has to lie on improvement in skill and training. The available technology rather seems to be incompatible with the quality of labour available in the developing countries. The modern technology is both capital and skill intensive and hence, incompatibility between the two can hardly enable firms to benefit in the context of globalisation.

The wage elasticity of employment does not turn out to be high across countries. Hence, the argument favouring wage flexibility through labour market deregulation does not seem to be empirically justified for employment generation. Wage-productivity links exist but these may get weakened with labour market deregulations, and thus the due share to labour may not get delivered. Detailed country specific studies need to be pursued before recommending labour market deregulations.

Our case study of the Indian organised manufacturing sector based on panel data shows that though the employment elasticity with respect to emoluments per employee is statistically significant in a large number of two-digit industry groups, the magnitude is not very high except in food, beverages, jute, textile, paper, non-metallic mineral and other manufacturing, where it turns out to be at least around 0.5. At the aggregate level the wage elasticity of employment is estimated at 0.24. Is not then the economic policy over-stretching the wage rigidity argument? As the empirical results show, reduction in wage rates cannot bring in miraculous increase in employment. Besides, labour market flexibility in terms of the changes in the mode of employment, i.e., from regular wage to contractual, casual and piece rate basis, has serious implications in terms of the social costs and welfare losses.

The results are also indicative of a weak relationship between productivity and wage even before the economic reforms were initiated. The partial elasticity of wage with respect to productivity for the aggregate manufacturing sector turns out to be 0.27 and 0.19 depending upon whether man days per worker is or is not included in the function, suggesting that only a small fraction of productivity gains is transferred to workers in terms of wage benefits.

Except some of the industries groups the effect of productivity on wage rose in the reform period compared to the pre-reform period. However, the magnitude of rise is only nominal. If we were to believe these results then labour market deregulations would further weaken these links, introducing gross inequality in income. The recent employment boom in the organised manufacturing sector is not necessarily an outcome of labour market deregulation. It could be due to recovery from an employment deceleration that occurred prior to 2003. Besides, the regional shift in the employment structure could have contributed to the employment boom. In the name of economic reforms neither labour should be marginalized nor should growth-maximizing strategy should be pursued without ensuring that its positive benefits accrue to those located at the lower echelons. From this point of view the role of institution in getting fair share to labour and in minimizing the social cost is important while steps are initiated to reallocate labour. It is of great significance that mechanisms which make labour market more flexible are also accompanied by measures that protect labour from welfare-loss. Besides, the innovation of technology that can enhance productivity without leading to employment-loss is of considerable importance in an economy faced with large underemployment and poverty.

### Appendix

**Table A: Regression Results for the Manufacturing Sector from UNIDO Data (Dep. Var. ln EMP)**

| Country   | Intercept        | lnVA             | lnW              | N  | Adj R <sup>2</sup> |
|-----------|------------------|------------------|------------------|----|--------------------|
| Argentina | 12.16<br>(4.93)* | 0.02<br>(0.10)   | 0.11<br>(0.73)   | 10 | 0.21               |
| Bolivia   | 8.10<br>(2.22)** | 0.12<br>(0.92)   | 0.04<br>(0.06)   | 7  | -0.04              |
| Botswana  | 11.52<br>(1.71)  | -0.07<br>(-0.18) |                  | 7  | -0.19              |
| Brazil    | 1.69<br>(0.64)   | 0.77<br>(5.46)*  | -0.58<br>(-7.11) | 9  | 0.93               |
| Cambodia  | -7.79<br>(-1.52) | 1.00<br>(3.66)*  |                  | 3  | 0.86               |
| Ecuador   | 5.42<br>(4.49)*  | 0.07<br>(1.76)   | 0.64<br>(5.43)*  | 10 | 0.78               |
| Eretria   | 8.77             | 0.05             | -0.0001          | 13 | -0.19              |

|  |                   |                   |                   |     |           |
|--|-------------------|-------------------|-------------------|-----|-----------|
|  | (3.25)*           | (0.28)            | (-0.28)           |     |           |
| Ethiopia                                     | 7.63<br>(6.89)*   | 0.29<br>(4.09)*   | -0.28<br>(-5.85)* | 15  | 0.72      |
| Indonesia                                    | 14.61<br>(6.31)*  | 0.02<br>(0.15)    | 0.05<br>(0.44)    | 6   | 0.13      |
| India  | 13.96<br>(4.94)*  | 0.16<br>(1.15)    | -0.30<br>(-0.67)  | 6   | -0.15     |
| Japan  | -3.27<br>(-1.66)  | 1.15<br>(9.72)*   | -1.23<br>(-6.58)* | 9   | 0.93      |
| Korea, Re                                    | 19.20<br>(6.11)*  | -0.47<br>(-2.57)* | 0.83<br>(4.52)*   | 13  | 0.78      |
| Macau, China                                 | 6.77<br>(2.48)*   | 0.45<br>(0.72)    | -0.59<br>(-0.39)  | 8   | 0.06      |
| Madagascar                                   | -2.64<br>(-1.05)  | 1.04<br>(6.59)*   | -0.85<br>(-4.34)* | 4   | 0.93      |
| Malawi                                       | 8.80<br>(2.71)*   | 0.16<br>(7.9)*    |                   | 3   | 0.95      |
|  | 10.56<br>(11.0)*  |                   | 0.23<br>(8.57)*   | 3   | 0.94      |
| Malaysia                                     | 12.46<br>(2.23)** | 0.38<br>(2.23)**  | -0.91<br>(-3.22)* | 4   | 0.82      |
| Mauritius                                    | 3.13<br>(0.50)    | 0.69<br>(1.71)    | -0.71<br>(-2.59)* | 6   | 0.61      |
| Mexico                                       | 28.74<br>(2.14)*  | -0.81<br>(-1.07)  | 0.57<br>(1.01)    | 7   | -0.09     |
| Mongolia                                     | 5.94<br>(0.56)    | 0.41<br>(0.58)    | -0.46<br>(-0.38)  | 5   | -0.70     |
| Morocco                                      | 4.06<br>(1.03)    | 0.47<br>(1.87)    | -0.18<br>(-0.87)  | 5   | 0.92      |
| Panama                                       | 10.75<br>(5.72)*  | 0.08<br>(0.92)    | -0.22<br>(-1.87)  | 9   | 0.18      |
| Philippines                                  | 4.93<br>(4.82)*   | 0.55<br>(7.96)*   | -0.52<br>(-5.93)* | 6   | 0.94      |
| Senegal                                      | 18.13<br>(7.32)*  | -0.48<br>(-1.32)  | 0.13<br>(0.20)    | 5   | 0.76      |
| Singapore                                    | 10.33<br>(12.96)* | 0.18<br>(3.86)*   | -0.18<br>(-3.31)* | 13  | 0.53      |
| South Africa                                 | 11.40<br>(10.51)* | 0.101<br>(1.98)** | 0.05<br>(1.79)    | 10  | 0.60      |
| Thailand                                     | 11.06<br>(4.48)*  | 0.15<br>(1.44)    |                   | 3   | 0.35      |
|  | 12.50<br>(10.15)* |                   | 0.28<br>(1.72)    | 3   | 2.33      |
| Uruguay                                      | 6.57<br>(3.54)*   | 0.38<br>(2.71)*   | -0.40<br>(-3.29)* | 6   | 0.83      |
| All Countries<br>Pooled<br>(Random<br>Effect | 6.03<br>(8.9)*    | 0.41<br>(10.48)*  | -0.29<br>(-5.56)* | 212 | R2 = 0.87 |

|           |  |  |  |  |  |
|-----------|--|--|--|--|--|
| Model)(1) |  |  |  |  |  |
|-----------|--|--|--|--|--|

Note: (1)Based on the Lagrange Multiplier statistic and Hausman test the RE model has been chosen over the classical regression model and the Fixed Effect model. (2) ln stands for logarithmic transformation, VA is value added, EMP is employment and W is real wage per worker.

Source: Based on UNIDO data (1990-2004).

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