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Trends in Employment and the Employment Elasticity in Manufacturing 1971-92. An International Comparison

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Abstract

The growth of employment in the manufacturing sector has been an important issue in development economics for a long time. Employment growth is, of course, limited by output growth in this sector, but the elasticity of employment with respect to output has varied widely in different regions and economies. This paper focuses attention the idea that a major determinant of employment elasticity is the way the fruits of output growth are divided between employment growth and wage growth. The nature of the division in any economy depends on labor market institutions, and in particular the way the interests of the 'insiders' work out relative to the interest of the 'outsiders'.

But before we are able to determine the quantitative dimension of the trade-off, we have to allow for two other factors which affect the size of the cake available to labor in real terms. These are: the elasticity of the wage bill with respect to output –which determines the trend in the share of labor; and secondly, the price effect, depending partly on the rate of inflation and partly on the movements of producer prices relative to consumer prices. A simple decomposition procedure has been outlined in the paper which allows us to quantify the relative importance of these factors, and hence give a clearer idea of the labor market outcome leaning to one or other of the two interests, employment growth and real wage growth. The empirical analysis for different regions of the world is carried out on time series data for the manufacturing sector collected by UNIDO from the national surveys of member countries for the decades of the seventies and the eighties.

It was found that, after allowing for the value of the of the wage bill elasticity and the price effect, East Asia shared its growth almost equally between real wage and employment increase. Study of the sub-regions of Asia revealed significant difference between SEAsia and China on the one hand, and South Asia on the other, particularly in the eighties. The latter had moved away in this period from the others to a labor market outcome which favored real wage growth much more than employment growth. In this respect South Asia approached the experience of EEC and Japan in both periods, and of the United States in the second. At the other extreme we have the experience of SSA which emphasized employment retention at the cost of real wage decline.

## I.	**Introduction.**

The problem of low employment elasticity in manufacturing--i.e. the feeling that employment growth has been lagging seriously behind output growth--has been a serious concern in development economics ever since concerns about the employment problem in third world countries started being discussed seriously in the sixties. An early survey of the issues was by Morawetz in 1974. He began his review with the following paragraph:

> The expansion of industrial manufacturing alone cannot be expected to solve the unemployment and underemployment problem in most developing countries. A manufacturing sector employing 20% of the labor force would need to increase employment by 15% per year merely to absorb the increment in a total workforce growing at an annual rat of 3%. The required rate of increase of manufacturing output is even greater than 15% if increases of labor productivity were taken into account. In the light of these orders of magnitude, the contribution of the industrial sector to employment growth over the last decade has been disappointing in many developing economies. In a number of countries in Latin America and Africa, despite significant investments in manufacturing, employment in the sector grew less rapidly than population, and in some cases even declined in absolute terms.

These concerns continue to demand the attention of development economists. In a recent analysis of the Indian experience since independence, Balhotra writes:

> The share of manufacturing output in GDP has grown from 10 per cent in 1951 to 33 per cent in 1991, in which the share in employment has grown from 11 per cent to 16 per cent (Popola 1992).

The issue of low employment elasticity takes on added significance because India, as many countries in Africa and Latin America, have undertaken serious deregulation of the economy. While growth in output and productivity, which have often accompanied these reforms has been welcomed as benefits of reform, the low level of job growth have generated skepticism regarding allocation of the benefits of growth. This is specially so because the wages in the modern manufacturing sector are already so much above those in the household or informal manufacturing (and service) sector—and if labor absorption continues to be slow in the high wage sector, population growth is bound to increase this gap as new job seekers increasingly press for absorption in the informal sector.

II The trade-off between wage growth and employment growth.

Employment growth in manufacturing is obviously limited by the rate of growth of output or value added. But given the growth rate of output there are three important elements which determine the value of the employment elasticity; (i) the trend in the share of wages, i.e., the rate of growth of the wage bill relative to value added in current prices facing the producer (ii) the relative rates of increase in the producer and consumer price indices—which determines the value of the wage bill for the workers and (ii) the trade off between employment increase and real wage increase. We shall now elaborate the importance of each of these elements in an intuitive way. The algebraic formulation of the relationships between these variables is spelled out in the next section.

The Share of wages

The share of wages in value added in neo-classical theory is determined by the technological factor of the production function. In alternative theories like that of Kalecki it is the mark-up price above costs which the producer is able to charge – or the "degree of

monopoly" in the market- which determines how much of output is available for distribution to labor. Whatever the importance of these factors it is likely that the share of wages would change only slowly over time. One point to note, however, in this connection is that, as will be borne out in the statistical analysis in the next section, the rate of inflation in an economy is an important determinant of the trend in the share of wages. Intuitively, it can be seen that indexation of wages to price increases can never be perfect. In economies in which the rate of inflation is high, the increase in wages lags behind prices, leading to a trend decline in the share of wages in current prices.

Given the growth of the wage bill in current prices its value in real terms from the point of view of the workers is determined by change in the ratio of producer prices to consumer prices. This ratio is sometimes called the 'domestic real exchange rate' (DRER), because the consumer goods are typically non-tradables and producer goods are more likely to be tradeables. If the DRER declines over time, then less of the wage bill cake is available to workers in real terms. It is easy to see that in an economy with a high rate of inflation, workers suffer in two ways: the value of the wage bill in current (producer) prices is reduced over time because of the lag of wage adjustment to price increase. Additionally, during inflationary spirals consumer prices are prone to increase faster than producer prices.[2] Both these effects are combined in the 'price effect' calculated in the algebraic decomposition of the next section.

The employment-wage trade-off

The increase in the wage bill can be used to support either increase of employment at the going wage or increase in the real average earnings of workers. There is thus a clear trade-

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[2] This is because as mentioned producer goods are more likely to be tradables whose international prices are tied to the world market. The domestic prices of such goods will depend on the exchange rate, and during a sustained inflationary period, the rate of devaluation is likely to lag behind the rate of inflation.

off between employment growth and wage growth. Alternative theories of wage determination are possible to account for the *causal* mechanism underlying the trade-off. In the neo-classical models of labor markets the causal mechanism runs from wages to employment. Real wage growth is determined first by the trends in the supply price of labor (alternative earnings), and employment growth responds to it through an inverse functional relationship. The extent of the trade-off is determined by the properties of the production function—more specifically by the elasticity of substitution between labor and other co-operant factors, principally capital and management. In the alternative neo-Keynesian version the causality runs more the other way. Labor market institutions, public policy and the macro-environment determine how the available cake is to be shared between employment growth and wage growth.

Two important points have been stressed in the literature, which emphasizes the autonomous determination of wages. First, we have the concern with the strength of 'insider' power. The insiders are those who are already in employment. They lean towards increasing their real wages at the expense of increasing the employment of more workers who are on the outside as job seekers. Labor laws in some countries might strengthen the 'insider' power either by supporting unions directly in the interest of industrial peace, or more commonly by instituting job security legislation, which helps to create a permanent elite workforce.

A second strand of research has stressed the point that the supply price of labor is never really given to the employer in a particular firm, as is purported to be the case in text book models of competitive firms. The serious flaw in this formulation is that it fails to recognize that, even after we have controlled for the measurable human capital attributes like education, training and experience, labor has two dimensions to its supply—the number of workers and the flow of efficiency units per worker. The latter is not simply the hours of work per day or week, but also the intensity of work per hour. The supply of efficiency units per worker is generally a positive function of the wage per worker, increasing as the wage increases. Thus the employer, responding to an increased demand for labor, has the option of

hiring more bodies of workers at the going wage or getting more efficiency units per worker by increasing the wage of the existing workforce. The optimum combination of strategy for a profit-maximizing firm is to select that combination where the marginal cost of hiring extra workers just equals the marginal cost of getting additional efficiency units per worker by increasing wages. The former includes the cost of supervising a larger body of workers, and would increase if the supply of effective supervisors were limited. Institutional factors like job security legislation would also increase the cost of hiring more workers. Thus the wage offered by the average firm—even to its new, unskilled recruit—is a variable subject to management decisions in which the institutional environment plays a big role. It should also be remembered that the choice between the two strategies of increasing the supply of labor units will vary with the size of the firms apart from other attributes. Thus the outcome for an average firm depends also on the structure of industry.

Both the strands of research- - insider power and efficiency wage—are merged together in the idea of internal labor markets specific to the firm. Manufacturing firms develop a labor system in which the stable core of workers enjoy lifetime employment in exchange for attachment to the individual firm. This system, which seems to have been most completely developed in the Japanese manufacturing industry, depends on the cooperation of enterprise-based unions with management. Recruitment of new workers tales place mostly at the entry level, at a young school-leaving age, and demand for experienced and skilled workers are sought to be made from the ranks of the firm-specific workforce through internal training. Furthermore new recruitment is made only for perceived long-term growth of employment. Short-term fluctuations of employment are taken care of either by the employment of casual non-tenured workers, or by the system of outsourcing in which some components of the final manufactured product are subcontracted to smaller firms. The larger enterprises with the internal labor markets would have a bias towards increase in earnings rather than employment as a means of increasing the input of labor in response to an increase in demand.

The discussion so far has not mentioned technical progress, and hence concentrated on the wage-employment trade off at a point of time. In a dynamic setting we must allow not only for changes in the strength of the factors governing the trade-off (e.g., the institutional influence of trade unions or government), but also technological progress affecting the production process. Generally we would expect technical progress to increase the skill levels demanded of labor. This would lead to an outward shift of the wage-efficiency function so that mangers would be more inclined to meet a given increase in labor demand through raising wages rather than hiring more workers. The optimum wage, at which managers are indifferent between raising wages or hiring extra hands, increases. Such changes also might be brought about by economic polices which have an effect on the efficiency with which co-operant factors are used in the manufacturing firm. In the recent history of the manufacturing industry in India economic liberalization has eased the bottlenecks in the supply of essential inputs which had been responsible for the low utilization of capacity in the manufacturing firms. As it has become easier for Indian managers to increase the utilization of machines in their plants, they have been more inclined to increase the number of hours supplied by a typical worker, and have been willing to pay a higher wage per man to elicit the extra hours contributed by each. This is one hypothesis which has been advanced to explain the phenomenon of "jobless growth" noticed in Indian industry in the eighties.[3]

In the next section we present a decomposition exercise which allows us to compare the trade-off between employment growth and wage growth, given the growth rate of value added in manufacturing, and the other factors discussed in this section. The detailed explanation of the tradeoff achieved within each region can, of course, only be worked out through intensive country-specific research. But a comparison of the outcome as between broad regions of the world is of some interest. It shows how the fruits of growth in manufacturing are shared out between 'insiders' and those outside the employed labor-force in this sector.

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[3] Balhotra(1998); Nagaraj (1994).

III. Methodology.

The statistical methodology suggested allows us to decompose the factors affecting real wage growth rate for any period and country into the various elements discussed: the rate of growth of output; the trend share of wages; the rate of employment growth; and the relative price effect. Important differences between countries and regions are noticed in terms of these variables.

Define the following variables:

w = real wage (average earnings per worker)

S_W = wage bill (in current prices)

V = value added (in current prices)

v = value added (in constant prices)

L = employment

P^p = index of producer prices

P^c = index of consumer prices

To define the relationship defining the movement of the wage bill with respect to value added over time we specify the following equation:

$$Sw = V^{\alpha} \quad \text{.. (1)}$$

α - is a technological and behavioral parameter which is assumed to remain constant over the period under consideration. But it can take any positive value and would generally vary from one economy to another depending on the factors determining the share of wages over time. If it has a value of unity, the share of wages remain constant.

-- A variable written with a dot on top (') represents a proportionate rate of change of the variable concerned.

Note that from (1)

$Sw' = \alpha \, V'$;

and $Sw' = (w' + Pc') + L'$, by definition.

We can then write the equation for the real wage growth as:

$$w' = Sw' - L' - Pc' \quad \text{.................... (2)}$$
$$= \alpha \, (v' + Pp') - L' - Pc'$$
$$= \alpha \, v' \quad - \; L' \quad + \quad \alpha \, Pp' \; - \; Pc' \quad \text{........... (2a)}$$

Output   employment   Price effect

effect   effect

The equation 2(a) focuses our attention on the employment elasticity (in the symbols of this section : l'/v') as being an outcome of the trade-off between employment growth and wage growth. But it is seen that the borders of this trade off are governed by there variables: output growth; the value of the α parameter determining the trend in the share of wages; and the price effect. The equation shows that real wage growth is higher the lower is employment growth (the second term in 2a). But it is impacted upon by two other factors: the output effect--the part of the real wage increase that could be ascribed to real growth in value added--given the value of α; and the last term showing the impact of changes the price levels facing producers and consumers over time. The latter is really composed of two distinct elements. The last term in equation (2a) could be re-written as :

$$(\alpha - 1) Pp' \; + \; (Pp' - Pc') \quad ....(3)$$

The first term in (3) could be called the 'wage share effect' of price changes over time. If $\alpha <$ 1 the share of wages in net output falls over time in current prices in accordance with equation (1). In this case the first term in (3) is negative, showing that a certain part of the real output growth, as measured by this term, is not available for the growth of the real wage bill. It is clear that the higher the inflation rate the greater will be the "leakage" from the available wage bill in real terms to support wage and/or employment growth. (As mentioned in the last section this effect can be traced to the lag in the adjustment of wage to the inflationary increase in prices). The second term is the rate of change in the ratio of producer to consumer prices or the so-called `domestic real exchange rate' (DRER). One can intuitively grasp its importance by considering the case of an inflationary economy in which the exchange rate depreciation lags behind the rate of inflation--a common enough scenario in developing countries. In this case the consumer price level which affects the real value of workers' wages, increases faster than producer prices which are tied to international prices of traded goods. Thus the second term in (3) is also negative implying that a portion of the real output growth is used to keep the wage bill growing at the same real rate. Both these "price effects", if negative, can be thought of as 'leakages' from the real output growth -- which decreases the rate of growth of the portion available for supporting employment or real wage growth.

All the variables can be calculated from time-series of the data typically collected in industrial censuses. There are, however, two alternative ways of dealing with α, the parameter determining the share of wages. The first method is to treat the equation essentially as an identity since all the variables can be quantified empirically except for the co-efficient 'α'. We could then, for any specified time period, plug in the growth rates of the different variables in the equation, including the actual growth rate of real wages, and then solve for 'α'. A second approach would be to estimate econometrically the time series data on value added and the wage bill--assuming a functional form relating to the two variables as in the equation (1)--thereby predicting the value for the growth trend of real wages. To the extent that our estimate contains an error term the predicted value will differ from the actual value.

Results based on the first approach only are presented in what follows. Although the equation is an identity, it has an economic content laying out as it does the existence of a trade-off between real wage growth and employment growth. The rate of growth of value added--after allowing for the DRER effect and the value of the parameter α -- determines the trade off between employment growth and wage growth. The higher the employment effect *caters paribus* the lower the wage growth. We have already discussed in the last section that alternative theories of wage determination are possible to account for the *causal* mechanism underlying the trade-off.

III. The Empirical Results for Four Regions.

The data utilized in our study come from the files of the United Nation Industrial Development Organization (UNIDO). It has a unique data set of the time series of key economic variables of the manufacturing sector of a large number of countries around the world. It is built up from regular reports made to the organization by the member countries.

The original sources of the data are the national industrial censuses or surveys of manufacturing establishments made by the government statistical offices in the countries concerned. The object of this paper is to utilize this data set to provide an inter-regional comparison of wage and employment trends within the manufacturing sector for the decades of the seventies and eighties. Unfortunately complete series for many of the countries are not yet available for the nineties.

We group the countries into four regions. The regional data are weighted averages, the weights being the dollar value of production in the manufacturing sector of the countries included in each region. The methodology of the statistical treatment, as well as the sample of countries making up each region are given in the Appendix. As could be expected the region with the smallest proportion of its countries figuring in our sample is sub-Saharan Africa. There are numerous gaps in the data set. The decision was taken to include only those countries which had data for most years for *all the variables* included in our decomposition exercise. Nevertheless, we believe that the regional results represent the trends in not only the sample countries, but for a large part of the region not represented by country observations. The author's detailed study of one of the countries not in the sample -- Ghana- using national data sources, reveal a pattern not dissimilar to that emerging for the SSA region in this paper (Mazumdar 1997).

The basic difference between the regions are set out in Table 1 which gives the annual growth rates of value added and the employment elasticity i.e. the rate of growth of employment divided by that of value added in the manufacturing sector covered by the UNIDO data set.

Table 1. Growth rate of value added and employment elasticity in the two decades.

Region	Rate of growth of Value Added		Employment elasticity	
	1971-80	**1981-92**	**1971-80**	**1981-92**
East Asia	10.72	11.05	0.54	0.39

OECD	3.30	3.77	-0.07	-0.08
Latin America (LAC)	1.89	1.83	-0.07	-0.43
Sub-Saharan Africa	0.93	4.73	4.72	0.86

Source: UNIDO

The table reveals the enormous variation in employment elasticities in the regions considered. Two of the regions have indeed negative elasticity in both periods, showing that employment actually declined even though manufacturing output was growing in real terms. The Africa region had the highest elasticity—enormously high in the first period—as employment growth in the formal sector took priority in the economic policy of this period. East Asia experienced a moderate employment growth vis-à-vis output growth between the two extremes. The difference in outcomes is due to the markedly different trade-off between employment growth and wage growth in the manufacturing sector. Regions like OECD and Latin America which registered employment decline would appear to lean towards wage increase of those already in employment in their 'revealed preference', while sub-Saharan Africa strongly favored expansion of employment. But the actual direction and the quantitative extent of the trade-off-- the proportion in which the available wage bill growth was divided between employment increase and wage increase-- cannot, however, be gleaned from the statistics presented in Table 1. This is because it should be apparent from the decomposition analysis presented earlier that there are two other elements involved : the trend in the share of wages α which modifies the 'output effect; and the price effect due to the rate of inflation and the movement of the domestic exchange rate. This is why the empirical implementation of equation 2(b) is important.

Results based on using equation 2(b) as an identity are presented in Table 2.

Table 2. Decomposition of Effects on the Growth Rate of Real Wage.

Period/Region	Real Wage Growth	Output Effect	Employment Effect (-)	α	P_P / P_P	P_C / P_C	Price Effect
1971-80							
East Asia	5.32	11.47	5.77	1.07	6.78	7.61	−0.41
OECD	1.72	3.27	-0.23	0.99	7.66	9.37	−1.78
LA & Caribbean	−2.13	1.83	-0.64	0.97	129.99	130.51	−4.60
SSA	−3.44	2.34	4.45	0.85	12.94	12.29	−1.33
1981-92							
East Asia	5.17	12.04	4.36	1.09	4.69	7.61	−2.53
OECD	1.35	3.03	-0.31	0.80	2.17	3.74	−1.99
LA & Caribbean	−3.13	1.77	−0.78	0.97	52.80	56.86	−5.68
SSA	−4.36	3.66	3.59	0.87	9.71	12.86	−4.43

Source: UNIDO data and price indices from World Tables. See text for definition of variables.

Notes: * The growth rates are weighted by ratios of average exchange rates and average real value added figures   of each country in the sample for each region. ** Figures may not add up due to rounding.

The results for the ESA region confirms the point made many time in recent discussions of growth in the world economy -- that this region led the world in its rate of growth, particularly in manufacturing by a wide margin. Note that the column showing figures for the 'output effect' in the table is the growth rate of real value added *multiplied by* the parameter α But even allowing for the variations in the value of α shown in column 5, the figures in column 3 show the extent of the disparity between ESA and the other regions in both periods. The labor market outcomes were markedly different as between the four regions. But before coming to this topic we should draw

attention to one important result revealed by the statistical analysis - - and that is the importance of the price factor in determining the portion of the output growth that was ultimately available for supporting employment or wage growth.

The Price Effect

All regions in both periods suffered from a negative price effect. But the *magnitude* of the negative effect was much more important in some regions than in others. LAC had very large negative price effects, which more than wiped out the modest output growth in both periods. In the seventies, the adverse movement of DRER contributed modestly to this state of affairs, as the consumer price index increased at a faster rate than the producer prices. But the more important reason for the large negative price effect was the high rate of inflation in this region. It is seen from the data presented that in both periods the share of wages in current prices fell modestly at the rate of 0.03 per cent. But applied to the inflation rate of nearly 130 per cent in the first period, this added up to a substantial rate of "leakage" from the real output growth which could sustain the growth in the wage bill (cf. equation 3 above). In the second period the rate of inflation moderated somewhat to a level of around 50 per cent, but the favorable effect from this slow-down was more than offset by a much larger DRER effect.

SSA suffered from an adverse price effect as well -- much more so in the second period, when it came close to the LAC figure. But this increase in the negative price effect for SSA is seen to be due entirely to the enhanced DRER effect, with consumer prices running ahead of producer prices.

Compard to the LAC and SSA regions, both EAS and OECD had a much smaller "leakage" due to the price effect. Given the modest inflation rate, the negative 'wage share effect' was not important except for OECD in the eighties, when there was a significant

downward trend in the share of wages. The negative price effect for these regions were mostly due to the adverse DRER effect.

As a final comment it is useful to recall the point mentioned earlier that in inflationary conditions it is normal to expect that the DRER effect would be negative, as the depreciation of the exchange rate lags behind the rate of domestic inflation, so that the consumer price index (dominated by non-tradeables) increase faster than the producer price index (with a larger weight of tradeables). But it is now seen from the data presented in Table 1 that even in regions with moderate inflation like EAS and OECD, the DRER trends were significantly negative in both the decades. This topic deserves more detailed research. An important role is clearly played by the downward trend in the relative price of manufactured tradeables due to a higher rate of technical progress.

Labor Market Outcomes

Given the real output growth, net of the price effect, the labor market shares out the potential gains partly in the form of employment increase and partly as increase in real earnings per worker. It is seen from Table 2 that the regions varied enormously in the proportions in which the output gain was divided. East Asia, in both periods, distributed the fruits of output growth almost equally between employment and wage growth. This implies that wages increased at roughly the same rate of labor productivity, and given the high rate of growth of output, the increase in wage was considerable. This type of labor market outcome is consistent with much discussion of wage setting institutions in East Asian countries. The study of Korea can be cited as an example. It has been maintained that profit sharing principles are ingrained in the wage formation process of Korean manufacturing. A substantial portion of workers' remuneration, perhaps as much as a third, are given in the form of productivity and profit related bonuses. An econometric model of wage determination strongly supported the

hypothesis that wages seemed to be significantly determined by a 'target wage' based on productivity growth of a previous period (Mazumdar 1993; cf. also Amsden 1990).

Sub-Saharan Africa and the OECD regions appear from the results shown in Table 1 to have been at opposite ends of the spectrum of employment-wage growth trade-off in both decades. In the seventies SSA shared with LAC the dubious distinction of having the lowest growth rates of manufacturing output in the world. The negative 'price effect', however was much less than in LAC. Nevertheless, net of the price effect the wage bill in real terms grew at a rate barely exceeding 1 per cent per annum. Yet employment growth was at a substantial rate of over 4.4 per cent. The only way the manufacturing sector of this region could accommodate this rate of employment growth was by a massive decline in real wage at the rate of 3.4 per cent per annum. In the next decade, the manufacturing sector of SSA seemed to have recovered a lot, registering a rate of growth of output averaging 4.4 per cent per annum over the period. But unfortunately the negative trends in the price effect nullified much of this enhanced growth. Net of the price effect output growth could not sustain the combined wage and employment growth at any higher level. Thus as employment growth continued unabated at over 4 per cent per annum, the SSA region as a whole experienced a decline in real wage at a rate even greater than what was witnessed in the previous decade. This experience of massive decline in real wage has been noted for many individual countries in Africa (**for an overview, see Jamal and Weeks ???**), as has been the phenomenon of "labor retention" on the part of African employers in the formal sector. A large proportion of manufacturing enterprises in the large-scale (as opposed to the informal) manufacturing sector have been state-owned or joint State-private ventures. The pressure to provide employment in this sector has been strong, and has increased as the decline in the economy shrank earnings and employment opportunities in other sectors. Although the UNIDO data set for SSA is imperfect, and number of countries which could be included in the sample is small, the over-all pattern is consistent with the conclusions of other commentators.

Turning to OECD countries, whose data reported to the UNIDO, are of the highest quality in the sample, output growth in this region as a whole has been modest, well below that of East Asia, but not as low as LAC in both periods, and SSA in the first. But the labor market trade-off is exactly the opposite of what was seen in Sub-Saharan Africa. These economies as a whole preferred to realize their gains in output over time in the form of real wage enhancement rather than employment growth. In fact the results show that the real wage growth was high enough -- given the modest output growth-- to actually result in a declining trend in employment in both periods. This story is again consistent with much discussion of the power of the 'insiders' in OECD industrial firms.

LAC had the lowest growth rate of output of all four regions in both periods. To make matters worse the price effect exerted a substantial negative trend, which could only be accommodated by declining trends in both real wage per worker and employment. Our results bring out the important point that this region took out the adverse effect of the declining 'pie' more on wages than employment both in the seventies and the eighties- thus showing some of the characteristics of SSA in labor retention.

We have so far presented he aggregate picture for four large regions of the world. This procedure has the advantage that weighted averages for a large number of countries could iron out some of the more extreme cases or country statistics -- arising either from substantive deviations from the regional average or inaccuracy in data reporting. We now try to supplement this analysis by presenting the difference between sub-regions of Asia and the OECD.

IV. Labor Market Outcomes in sub-regions of Asia

We distinguish between China, South Asia and South-East Asia. China is a region unto itself, and its manufacturing sector in the periods studied consisted mostly of State enterprises.

The difference between South and South-East Asia in terms of rate of growth and labor market institutions have been much discussed in the literature.[4]

Table 3. Decomposition of Effects on the Growth rate of Real Wages: sub-regions of Asia

Period/ Region	Real wage Growth rate	Output Effect	Employment Effect(-)	α	Pp'	Pc'	Price Effect
1971-80							
China	7.18	10.63	2.18	1.08	-0.003	1.27	-1.27
SEAsia	3.20	12.40	9.89	1.07	14.53	14.85	0.69
South Asia	0.45	4.60	4.75	0.91	10.44	9.09	0.43
1981-92							
China	4.26	12.04	3.29	1.02	4.24	8.83	-4.49
SEAsia	6.37	12.35	5.86	1.20	4.93	6.02	-0.12
South Asia	3.79	6.15	1.00	0.97	7.56	8.66	-1.36

Source: Same as Table 1.

The high rate of growth which distinguished the sample of countries of ESA in Table 1 is also seen in the case of the narrower group of SEAsian countries. We also see this group dividing the fruits of output growth between employment and real wage growth as in ESA. But in this case the division was more equally split between the two variables in the second period, rather than in the first. One relevant point which might throw some light on the causes of this slight difference with the ESA sample is that the SEAsia region included the countries which have been industrializing strongly in more recent years, while EAS had a few countries which had led the post-War industrialization of the Eastern Asia. Thus in the decade of the seventies

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[4]It should be noted that China is included in the sample of countries included in EAS in Table 1. South Asia is not in this table. Additionally the sample of countries included in SEAsia an Table 2 is different from the sample from this region figuring in Table 1. See the Appendix for details.

SEAsia probably had a larger reservoir of labor in low productivity activities, making the supply of labor to modern industry more elastic.

Of the sub-regions of Asia, China stands out as having had a markedly adverse price effect particularly in the second period. Thus while the rate of growth of real value added in manufacturing was almost as high for China as for SEAsia in both periods, the growth rate of the cake which could be divided between employment and real earnings per worker was much smaller for China. In the decade of the seventies China opted for a strategy that favored real wage growth rather than employment growth. One third of the growth in output (net of the price effect) was allocated to employment, and two-thirds to wage increase in the seventies. This contrasts with the experience of SEAsia who divided the output growth in exactly the opposite way-- one third in real wage increase and two-thirds in employment growth. In the next decade China and SEAsia moved much closer to each other-- with the available output growth being divided almost equally to support wage increase and employment growth.

Turning to South Asia, a spectacular change seems to have occurred in this region between the two periods. Output growth was at a much slower rate than in China and SEAsia, and net of the price effect, practically the same in the seventies and the eighties. But while in the seventies nearly the whole of the output growth went to support employment growth, the situation was reversed in the eighties with the bulk of the output growth supporting real wage increase. While China seems to be correcting the inequitable trend in the employment-wage trade off in the second period, South Asia moved away in the eighties rather spectacularly from the equity norm. A more rapidly rising earnings per worker in the eighties in SEAsia might be traced to a shrinking of the reservoir of low productivity labor, as the modern sector expanded rapidly. But no such significant change in the supply-demand equation in the labor market can be traced in any of the countries in the sample for South Asia. Thus the rather sharp tilt towards wage growth in the wage-employment trade-off in the eighties has to be ascribed to important institutional changes in the modern manufacturing sector of South Asia. This trend in

labor market outcomes in the formal labor markets of South Asia has been noted and widely commented on by observers using different data sets. Hanson and Lieberman(1981) noted " a confluence of factors at work in the early to mid-eighties (which) can in large part explain the sharply deteriorating performance of Indian manufacturing in generating new employment opportunities, even while it was moving to high growth path in terms of output" (p.108). The authors pointed the finger at the 'insider bias' of India's industrial and labor relations system for this outcome. Other references are ILO-ARTEP (1993, ch 2.4) Lucas and Fallon (1989), Nagaraj (1994) and Balhotra (1998).

V. Labor Market outcomes in the sub-regions of OECD

Finally, we look at some difference in the outcomes in terms of our wage-employment trade off for different parts of the OECD region. The extensive discussion which exists in the literature on OECD have distinguished different types of institutional forces operating in the labor markets of European countries (EEC), the United States and Japan. We will now try to see what light our framework of analysis of the UNIDO data set can shed on these differences in these three sub-regions. The results are set out in Table 3.

Table 4. Decomposition of the Effects on the Growth rate of Real Wages: sub-regions of OECD.

Period/ Region	Real wage Growth rate	Output Effect	Employment Effect(-)	α	Pp'	Pc'	Price Effect
1971-80							
EEC	3.30	3.18	-0.70	1.03	9.40	10.30	-0.59
United States	-0.09	2.78	1.00	0.96	6.48	8.10	-1.86
Japan	2.58	5.11	-0.99	1.15	5.48	9.84	-3.53
1981-92							
EEC	1.81	1.56	-1.04	0.79	4.60	4.40	-0.79
United States	0.63	3.56	-0.36	0.76	0.82	3.91	-3.29
Japan	2.00	4.44	0.56	0.76	-0.25	1.68	-1.87

Source: Same as Table 1.

In the decade of the seventies Japan had the highest growth rate of value added in manufacturing, but only a fraction of this growing cake was available for real wage and employment growth owing to the strong price effect, particularly the substantial increase in the ratio of the consumer price index to the producer price index (The DRER effect). The United Sates had the lowest rate of output growth, and this rate was further depressed from the point of view of the workers' wage bill in real terms by the adverse price effect.

In spite of this generally low net output growth for all three regions in Table 3, important differences emerges in the way this modest output gain was shared between real wage and employment increase. In particular, we can see a strong contrast between EEC and Japan, on the one hand, and the United Sates on the other. Both EEC and Japan favored wage growth so much that they both suffered from a declining trend in employment in manufacturing. The United Sates, on the other hand, was able to apply its output increase almost entirely to

supporting employment growth at a slightly declining level of real wages. The contrasting picture points to the much greater influence of 'insiders' in Japan and the EEC on labor market developments, and to the much more 'open' labor markets in the manufacturing sector of the United States.

In the more recent decade of 1981-92, a remarkable development seems to have been that the parameter α - defining the growth rate of the wage bill to that of value added - has been substantially below unity for all the three sub-regions. This low value of α is not only different from that of these entities in the seventies, but also different from the experience of other regions discussed earlier. It means that for EEC, Japan and the United States (as indeed for the OECD region as a whole, as we see from Table 1 above), only around three-quarters of the growth rate of value added has been available for sustaining the rate of growth of the wage bill in manufacturing.   Non-labor factors have been increasing their share of the output. This factor has accentuated the continued adverse movement of the price effect in depressing the growth rate of the wage bill. The combined effect of the two factors made the growth rate of the real wage bill to a dismal 0.27 per cent per annum. The US labor markets worked in such a way that the rate of growth of average real earnings was higher than this figure, so that employment had to have a negative trend to accommodate the wage increase. In this way, the United Sates in this period seemed to have joined the ranks of EEC and Japan in the experience of the last two already noted in the seventies, and continued in the eighties-- viz., 'insider' power strongly biased labor market outcomes to wage increase at the expense of employment increase.   The relative importance of this factor can be seen from the data given in Table 4 for the three sub-regions and the two periods. The figures express the rate of increase of real wages achieved as a percentage of the rate of growth of the 'net output' (net , that is of the price effect' which was available to support the growth of the wage bill. The figures are calculated from the results presented in Table 3.

Table 4. The rate of growth of real wage as a percentage of the rate of growth of the wage bill

		24
Sub-Region/Period	1971-80	1981-92
EEC	122.8	235.1
United States	-0.1	233.3
Japan	163.3	77.8

Source: Table 3.

It is seen that in relative terms, the United States had not only joined the other two sub-regions in showing the dominance of 'insider' power, but had become along with EEC top of the list in the *intensity* with which this power has been exercised. Japan has come down considerably in the intensity of this power.

VI. Conclusions

Employment growth in manufacturing is ultimately dependant on output growth, but the enormous differences in employment elasticity in different regions require explanation even at the aggregate level. This paper has highlighted the idea that a major determinant of employment elasticity is the way the fruits of output growth are divided between employment growth and wage growth. The nature of the division in any economy depends on labor market institutions, and in particular the way the interests of the 'insiders' work out relative to the interest of the 'outsiders'. But the outcome of the trade-off cannot be determined only from gross figures of output growth and those of real wages and employment. This is because the result depends on two other factors: the parameter (α) determining the share of wages; and the price effect including the trend in the domestic real exchange rate. A decomposition procedure has been outlined in the paper which allows us to quantify the relative importance of these factors, and hence give a clearer idea of the labor market outcome leaning to one or other of the two interests, employment growth and real wage growth.

The broad view of inter-regional differences revealed by the empirical analysis of the time-series is of interest in itself, and provide suggestions for more intensive study of the different experiences of countries/regions. Enormous regional differences have been identified

in the growth rates of output or value added. ESA, and within it China and SEAsia, are seen to have led the world in the growth rate of manufacturing output by a very wide margin both in the seventies and the eighties. LAC and SSA are at the other end of the spectrum.

The empirical material presented in the Tables show that the value of α has not deviated substantially from unity in any of the regions or periods -- except in the case of OECD and its sub-regions in the 1981-92 period, and to a smaller extent in SSA in both periods. However, the price effect has been a strong determinant of how much of the output growth was left to support the growth of the wage bill in real terms. The price effect was negative in most regions in both periods. Particularly large negative values were registered for LAC, and the OECD in both periods and for SSA and China in the second period.

In our empirical analysis it was found that, after allowing for the value of α and the price effect, East Asia shared its growth almost equally between real wage and employment increase. Study of the sub-regions of Asia revealed significant difference between SEAsia and China on the one hand, and South Asia on the other, particularly in the eighties. The latter had moved away in this period from the others to a labor market outcome which favored real wage growth much more than employment growth. This development probably shows the greater strength of power of 'insiders' in the manufacturing firms, which has been remarked on in the literature. In this respect South Asia approached the experience of EEC and Japan in both periods, and of the United States in the second. At the other extreme we have the experience of SSA which emphasized employment retention at the cost of real wage decline.

The net result of these different factors working in different ways is the enormous range of employment elasticity's in the seventies and the eighties.

Suggestions for country level research

The methodology used in this paper can be usefully employed to an individual economy. In this case the interest of the comparative analysis shifts from differences between types of economies or regions to segments of the manufacturing sector. Several points of comparison within a country's manufacturing sector might be suggested.

First, an important distinction is between the group of industries producing exportables and those catering more to the domestic market. Labor market outcomes might work out in very different ways, and indeed the trend in the ratio of producer prices to consumer prices might be very different in the sub-sets of industries.

Secondly, a matter of great interest, even in the formal manufacturing sector, is the behavior of groups of enterprises of different sizes. In countries in which Survey of Manufacturing data are available classified by size groups of enterprises (or firms) much useful results of analytical and policy interest can be found by studying the decomposition of wage growth for small, medium and large firms within the sector, in the way it has been done for regions in this paper.

Thirdly, in the analysis presented in the paper we have dealt with the average earnings of all workers employed in formal manufacturing in the countries concerned. This was justified so long as we are concentrating on the broad issue of the division of the fruits of growth between employment growth and wage growth in the sector as a whole; and when we are dealing with broad comparison of outcomes across regions of the world. In a country level study labor needs to be disaggregated into its most important components. Division by levels of skill is one important disaggregation. Another particularly relevant one in the South African context is disaggregation by race.

REFERENCES.

Balhotra, Sonia R.. 1998. 'The Puzzle of Jobless Growth in Indian Manufacturing', Oxford Bulletin of Economics and Statistics 60, 1, 5-32.

Fallon, Peter J. and R. Lucas (1991). "The Impact of Changes in Job Security Regulation in India and   Zimbabwe'. *The World Bank Economic Review* 5, 3, 395-414.

Hanson, James A. and Samuel S. Lieberman (1989). *India: Poverty, employment and Social Services.* A World Bank Country Study. The World Bank. Washington DC

ILO-ARTEP (1993). *India: Employment. Poverty and Economic Policies..* A Report prepared under the Project sponsored by the UNDP. International Labor Organization, New Delhi.

Mazumdar, Dipak (1993). 'Labor Markets and Adjustment in Open Asian Economies: the Republic of Korea and Malaysia'. *The World Bank Economic Review,* 2, 1, 349-380.

_____ (1997) 'Wages and Employment in Ghana' *processed,* Department of Economics, University of Toronto.

Nagaraj, R. 1994. 'Employment and Wages in Manufacturing Industries: Trends, Hypotheses and Evidence' Economic and Political Weekly, 29, 4, 2313-32.

APPENDIX.

I. Methodology for preparing regional averages of time trends of Variables.

The UNIDO data set provides time series for the variables used in this study for the period 1971-92 for individual countries of each region. This data set is available in the diskettes made available by the World Bank under the title of "STARS: World Tables 1994". We needed to construct regional averages of exponential growth rates of each of the variables from the country level data. The weighting factor for the growth rates of value added, wage bill and producer and consumer prices was the relative size of the economy in the region measured in dollar values. Thus to calculate the growth rate of real value added for the region the following steps are involved:

(i) First the value added series is deflated by the producer price index for manufacturing, available in the UNIDO data set, and exponential growth rates for the periods 1971-80 and 1981-92 are calculated for each country. In doing this part of the exercise, countries with less than 4 observations in each period were dropped.

(ii) After calculating the growth rates, the average value added deflated and the average exchange rates Local currency per dollar) for each period were used for weighting to adjust for differences in the size of the economy and exchange rate fluctuations. To find the averages we took the figures for 1st, middle and last years of each period for each variable (i.e., the average value added deflated and average exchange rates for the years 1971, 1976 and 1980 were used for the period 1971-80, and we used the observations for 1981, 1986 and 1992 for the next period.

(iii) The ratio between the average value added and average exchange rate is then used as a weighting factor to value the figures of growth rates in terms of a common currency. The weighted growth rate for each country would then be the growth rate for each country multiplied by the corresponding weighting factor.

(iv) Finally, the weighted average for each period is calculated as the ratio between the sum of the weighted country level growth rates in the region and the regional sum of the weighting factors.

For calculating the growth rate of employment growth, a different weighting scheme was adopted. Unlike the other variables, the average employment in each country (instead of value added and exchange rate)

was used as the weighting factor. However, due to data insufficiency, we had to stick to the value

added weights for the growth rates of employment for East Asia and Latin America.

II. The country samples for each region.

Sub-Saharan Africa	East Asia	OECD	Latin America & Caribbean
Botswana	China	Australia	Argentina
Ethiopia	Fiji	Austria	Barbados
Kenya	Indonesia	Belgium	Bolivia
Mauritius	Korea, Rep. Of	Canada	Chile
Swaziland	Malaysia	Denmark	Colombia
Tanzania	Philippines	France	Ecuador
Zambia	Thailand	Finland	Honduras
Zimbabwe	Tonga	Germany	Jamaica
	Papua N. Guinea	Iceland	Mexico
		Italy	Panama
		Japan	Surinam
		Luxembourg	Trinidad and Tobago
		New Zealand	Uruguay
		Norway	Venezuela
		Spain	
		Sweden	
		United States	

South-East Asia	EEC	South Asia
Indonesia	Belgium	Bangladesh
Korea, Rep. of	Denmark	India
Malaysia	France	Pakistan
Philippines	Germany	Sri Lanka
Thailand	Greece	
	Ireland	
	Italy	
	Luxembourg	
	Netherlands	
	Portugal	
	Spain	
	United Kingdom	
	Netherlands	