

Economic Growth and Growth of Employment in West Bengal

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ABSTRACT

The present paper analyses the interrelationship between growth of output and growth of employment in West Bengal. Growth rate of output has been significantly increased during the post-reform period in West Bengal but not the growth rate of employment. In panel data investigation the study finds that the growth rate of employment is positively affected by growth rate of output and inversely affected by growth rate of labour productivity. The growth of labour productivity also adversely affects the employment elasticity of output in West Bengal.

Key Words: Economic reforms, Growth, productivity, employment, job loss.

JEL Classification: E23, J21, J24.

I. Introduction

During the liberalized era West Bengal economy has experienced a growth of almost 220 percent in real State Domestic Product (SDP) between 1993-94 and 2011-12, and the per capita real SDP increased by almost 147 percent over the same period. But employment has increased only 36.6 percent during this period. The state like West Bengal where population density is very high (1029/square km) the increase of slow growth of employment is a major concern for the policy makers and academicians. The state holds a large and rich human capital. West Bengal was among the more industrialised state of the country at independence. The state started to lose its industrial primacy among the states in India since the mid-1960s and the recessionary effect on industry in the state was not only the most severe but long drawn out as well (Bagchi 1998). But rate of manufacturing growth revived after the mid-1990s (Govt. of India 2010). The fluctuation in employment and unemployment has to come to terms with the periodic instability of the growth process. The trend in employment, in fact, is the outcome of the changing combinations of capital, technology and the labour market situation. West Bengal has been situated in what has been a relatively poor and economically stagnant region of India, such that there have been very few economic growth stimuli coming from the surrounding region. The significant amount of people from neighboring states as well as countries depends on the state economy for their livelihood. The pertinent questions that come out in the context of West Bengal are: Why the employment situation is not encouraging though the state has observed very high growth of output? Is the labour productivity act as the catalyst of growth and low growth of employment? What is the nature of growth across sectors? The relevant studies are now dealt with.

Choi (2007) examined the employment effect of economic growth. He considered an equilibrium labour market model in addressing this issue and found the structural determinants' of

employment elasticity. He showed that the elasticity is determined by preference and technology parameters and pointed out that the apparently labour-saving technology alone may not be responsible for the slow increase in employment. He found that the elasticity of labour supply with respect to wage is an important determinate of employment effect of economic growth.

Hull (2009) pointed out that growth in one sector of the economy will not automatically translate into benefits for the poor: much will depend on the profile of growth (its employment or productivity intensity), the sectoral location of the poor, and the extent of mobility across sectors. He claimed that for employment-intensive growth to translate into poverty reduction it must occur in a more productive sector, while less productive sectors may require productivity-intensive growth to ensure a decline in headcount poverty.

Das (2014) investigated the interrelationship among growth, productivity and employment in India. His empirical results contradicted with the argument of Patnaik (2011) and established the conformity of the interrelationship among growth of output, employment and productivity. The study found that the growth of labour productivity adversely affects the growth of employment in India.

From the brief review of the existing literature it is clear the above mentioned problems are not addressed adequately in the context of West Bengal. In this brief background the present paper deals with the trend of growth of output and growth of employment in relation with growth of labour productivity in West Bengal. It also analyses the nature of growth across different sectors in terms of output elasticity of employment.

In the present study, NSSO data have been used for five points of time during post-reform years in India- 50th round (1993-94), 55th round (1999-2000), 61st round (2004-05), 66th round (2009-10) and 68th round (2011-12). The labour force indicators derived from the different NSSO employment and unemployment survey. Absolute number of workers was estimated by using Census segment-wise population (male, female, rural and urban) projections and NSS segment-wise workers population ratio (Himanshu, 2011 and Das, 2014). From 61st round and onwards NSSO itself estimated the absolute number of workers by using the same methodology. All the rounds from the 50th to 66th are fully comparable to each other and give a long-term trend in employment for the last two decades. We also use CSO data for state domestic product (SDP) during 1993-94 to 2011-12 at constant (2004-05) price.

The rest of the paper is divided into three sections. Section II analyses the theoretical relationship among growth of output, growth of productivity, growth of employment in West Bengal. Sections III analyses the trends of per capita SDP, labour productivity and employment in West Bengal. It also deals with nature of growth across different sectors. Section IV analyses the interrelationship among growth of SDP, growth of productivity and growth employment across sectors. Finally, section V gives some concluding observations.

II. Theoretical Relationship among Productivity, Growth and Employment

For fixed coefficients (FC) which change over time through technological progress, and no deficiency of aggregate demand (ND) (with capacity rather than labour availability being the constraining factor for output), then the rate of growth of employment is determined as the difference between the rate of growth of output (which depends upon the savings and capital-output ratios) and the rate of growth of labour productivity (which depends on the pace of technical progress) (Patnaik 2011). Here, a rise in the rate of growth (G), unless accompanied by a still greater rise in the rate of growth of labour productivity (G_{lp}), will necessarily raise the rate of growth of employment (G_e). That is

$$G_e = f(G - G_{lp}), f' > 0,$$

Here, $G = (Y_t - Y_{t-1})/Y_{t-1} = S/C$, (s = propensity to save and c = capital-output ratio)

G_{lp} = Growth of Labour Productivity = $f_i(\text{Technological Progress})$, and $f_i' > 0$.

$$G_e \geq 0, \text{ if } G \geq G_{lp}$$

If we take the Kaldor- Verdoorn formulation (Kaldor 1966) of the rate of growth of labour productivity being a function of the rate of growth of output, say

$$G_{lp} = a + bG$$

Then the rate of growth of employment G_e which simply equals $G - G_{lp}$, becomes an exclusive function of the rate of growth of output, i e,

$$G_e = G - G_{lp} = -a + (1-b)G$$

And with $b < 1$, any rise in growth rate of output (G) raises the rate of growth of employment (G_e).

When this perception is put together with another, quite plausible, perception, namely that in a situation where the unemployment rate is very high ($(UR)_h$), real wages remain tied to a certain subsistence level ($(W/P)_s$), so that all gains in labour productivity (LP) accrue to the capitalists, the share of surplus in output rises, and with it the savings ratio in the economy. The rise in the savings ratio, since the capital-output ratio can be taken to be a constant, raises the growth rate. This, in turn, as we have just seen, raises the rate of growth of employment. If the rate of growth of the workforce is given, this must eventually lower the unemployment rate.

III. Growths of Output, Productivity and Employment in West Bengal

Trend of Per capita GDP, Labour Productivity and Employment Rate

The relationship among per capita GDP, labour productivity and work participation rate is state forward.

$$SDP/P = SDP/E \times E/P$$

Where, $SDP/P = SDP/\text{Population} = \text{per capita GDP}$

$SDP/E = SDP/\text{Employment} = \text{Labour Productivity (LP)}$

$E/P = \text{Employment}/\text{Population} = \text{Work-Participation Rate (WPR)}$

Per capita GDP of West Bengal was Rs 13513.6 in 1993-94 which increased to Rs.33310.7 in 2011-12. Labour productivity was much higher than per capita GDP and it increased from Rs. 36312.3 in 1993-94 to Rs.84819.8 in 2011-12. Both labour productivity and per capita GDP were upward trend and overtime they were divergent each other (Figure 1). The WPR, i.e. the ratio of employment to population also gradually increased since 1999-2000 (Figure 2). It increased from 0.35 in 1999-00 to 0.39 in 2011-12. The trend of WPR is upward rising during the post-reform period. But, in contrast, the trend of WPR during this period is downward in India (Figure 3).

Table 1 : GDP, Per Capita GDP, LP, Employment and WPR in West Bengal, 1993-94 to 2011-12

West Bengal	1993-94	1999-00	2004-05	2009-10	2011-12
Population(Crore)	7.13	8.14	8.54	8.95	9.23
SDP(Rs. Crore)	96360.8	146261.6	190028.9	263229.9	307452.6
SDP/P	13513.6	17975.9	22259.1	29404.8	33310.7
Employment(Crore)	2.65	2.87	3.26	3.41	3.62
SDP/E	36312.3	51007.7	58248.0	77373.1	84819.8
WPR	0.37	0.35	0.38	0.38	0.39

Note: GDP at Constant Price (base year 2004-05).

Source: 1. Central Statistical Organization, Government of India, www.mospi.nic.in.

2. NSSO, *Employment and Unemployment (Situation) in India, Rounds 50th, 55th, 61th, 66th and 68th.*

Figure 1: Trend of Per Capita GDP and Labour Productivity in West Bengal, 1993-94 to 2011-12.

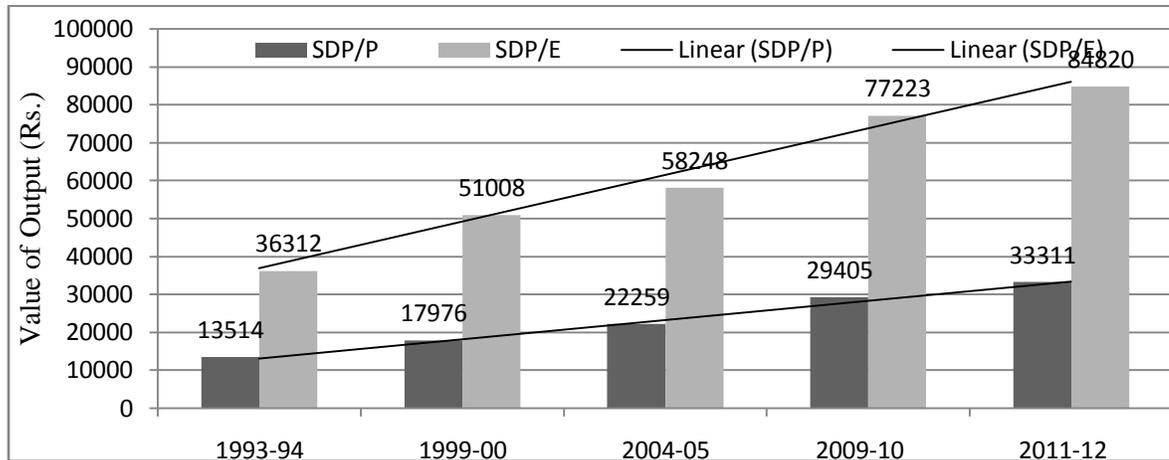


Figure 2: Trends of Work Participation Rate (WPR) in West Bengal, 1993-94 to 2011-12.

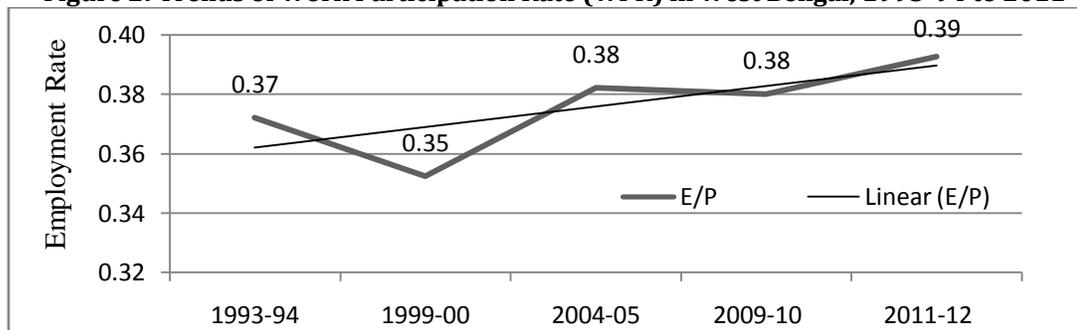
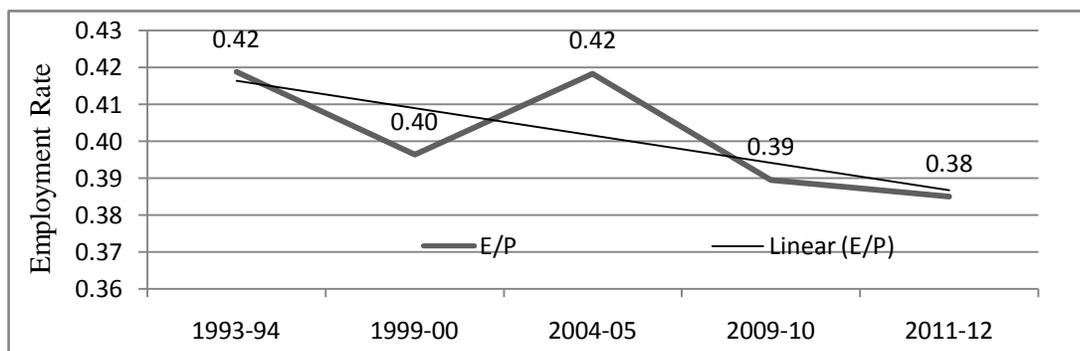


Figure 3: Trends of Work Participation Rate (WPR) in India, 1993-94 to 2011-12.



Source: Das (2014).

Trend of growth of Output, Labour Productivity and Employment

Average annual growth rate of output, labour productivity (LP) and employment in West Bengal are shown in Table 2 for different sub-periods during post-reform years. The per capita growth rate of GDP in West Bengal was 8.6 per cent per annum and corresponding growth rate of

LP was 6.7 per cent per annum during 1993-94 to 1999-2000. Both the per capita growth rate of SDP and growth rate of LP were deteriorated during 1999-00 to 2004-05 and revived thereafter. The growth of employment in West Bengal is also fluctuated from one period to another period. The period corresponding high growth of employment seems to be for the low growth of LP. During 1999-00 to 2004-05, the growth rate of employment increased corresponds with decline of growth rate of output as compared to the earlier period. This is for the decline LP growth. During the recent years, i.e. during 2009-10 to 2011-12, the growth of output was increased and substantially high as declined the growth rate of LP. As a result the growth of employment has been expanded significantly (Figure 4). During 2009-10 to 2011-12 the growth rate of output in India stood at 8.10 percent and the growth rate of LP at 6.86 percent; the resultant outcome was 1.08 percent increase of employment (Figure 5). The growth rate of employment in West Bengal was relatively higher (3.17 per cent) than that of India during this period.

Table 2 : Per capita Growth Rate of Output, Productivity and Employment in West Bengal, 1993-94 to 2011-12

	1993-94 to 1999-00	1999-00 to 2004-05	2004-05 to 2009-10	2009-10 to 2011-12
Per capita output	8.6	6.0	7.7	8.4
Labour Productivity	6.7	2.8	6.5	4.9
Employment	1.34	2.75	0.90	3.17

Source: Calculation based on Table 1.

Figure 4: Growth Rates of Output, Productivity and Employment and their Trend in West Bengal.

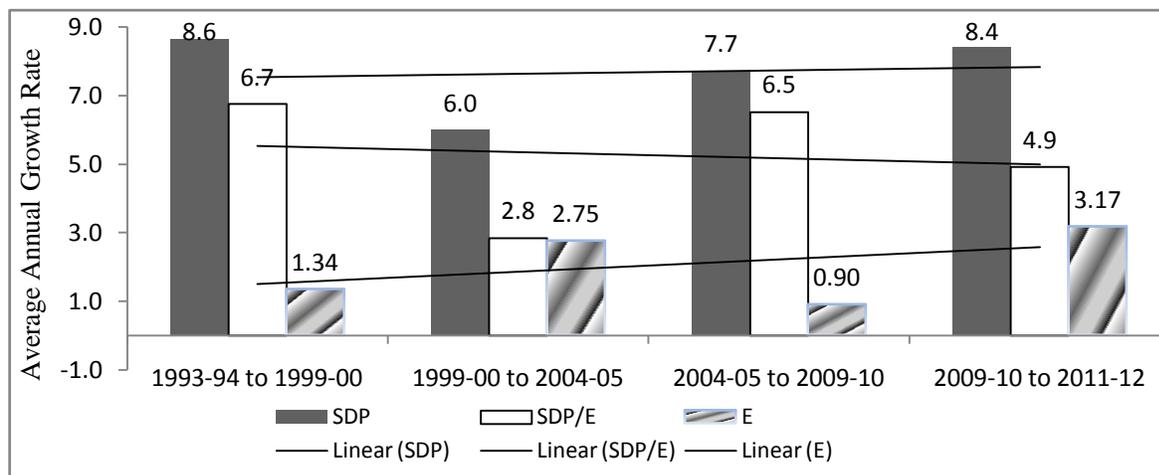
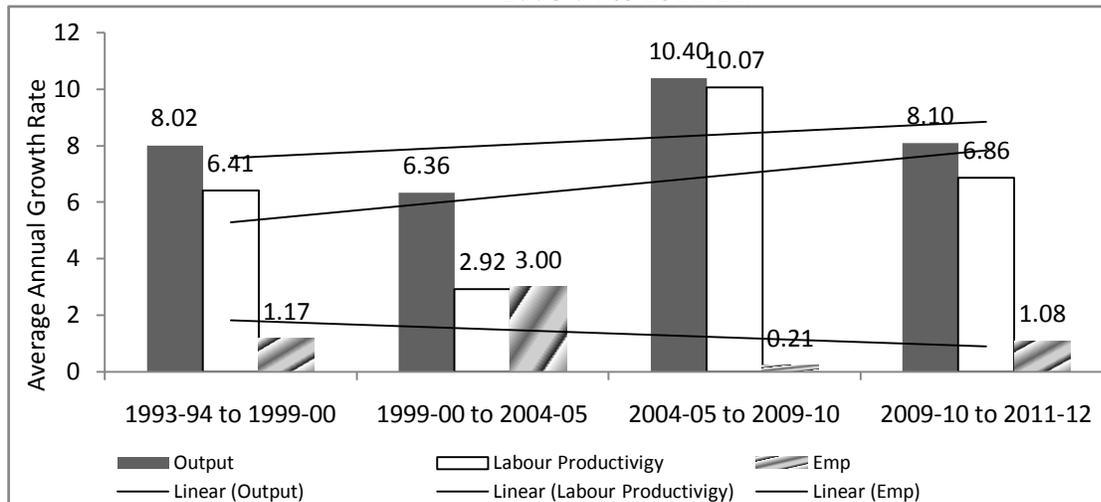


Figure 5: Growth Rates of Output, Productivity and Employment and their Trend in India, 1993-94 to 2011-12.



Source: Das (2014).

During the entire period the trend of growth of employment was upward rising in contrast with the downward trend of employment growth in all India level (Figure 4). The contrasting feature of employment is due to the trend of growth of LP. The trend of growth of labour productivity was downward sloping in West Bengal but it was upward sloping in all India level.

Rate of Growth of Output and Employment by Sector in West Bengal

Table 3 presents the average annual growth rate of employment and growth rate of output across sectors in West Bengal. The growth rates are widely varied across sectors. The growth of output of primary sector declined over time and the growth of employment was negative after 2004-05. The structural transformation takes place and non-farm sector has experienced higher growth of output as well as employment. The growth of output is significantly high in tertiary sector and higher than that of secondary sector. But the growth of employment in the secondary sector higher than that of tertiary sector. That is, more employment have been generated in the secondary sector. Within the secondary sector, the construction sector has observed higher growth of employment followed by manufacturing during the post-reform period. Within tertiary sector the growth of employment has slowed down in Trade-Hotel-Restaurant and Transport-Storage-Communication.

Table 3 : Average Annual Growth Rates of Output and Employment in West Bengal by Sector, 1993-94 to 2011-12

Sectors	Growth rate of Employment				Growth rate of Output			
	1993-94 to 1999-00	1999-00 to 2004-05	2004-05 to 2009-10	2009-10 to 2011-12	1993-94 to 1999-00	1999-00 to 2004-05	2004-05 to 2009-10	2009-10 to 2011-12
Agriculture & Agri-Allied	0.8	2.4	-1.6	-1.3	4.4	2.1	2.7	0.5
Mining, & Quarrying	-5.0	1.9	10.4	-10.3	2.3	10.0	-2.1	-6.7
Manufacturing	0.7	0.8	3.7	6.6	9.1	7.6	6.5	6.5
Electricity, Gas & Water Supply	5.6	-8.8	1.4	51.1	6.9	8.7	3.1	4.1
Construction	2.4	11.1	6.9	18.9	7.4	12.7	3.9	6.6
Secondary (2-5)	0.8	2.1	4.5	9.3	7.8	9.6	4.7	5.8
Trade, Hotels & Restaurant	6.9	2.9	2.6	1.5	8.6	10.0	10.3	13.9
Transport, Storage & Communication	6.9	2.8	2.6	-0.9	11.2	6.6	8.9	13.1
Other Service	-1.8	5.3	0.9	8.4	13.8	6.4	12.3	10.4
Tertiary(6-8)	2.7	3.7	1.9	4.0	12.1	7.0	11.0	11.7
Non-Farm(2-8)	1.8	3.0	3.0	6.4	10.9	7.6	9.4	10.4
Total	1.34	2.75	0.90	3.17	8.6	6.0	7.7	8.4

Source: Calculation based on Table 1.

Employment Elasticity of Output and nature of Growth in West Bengal

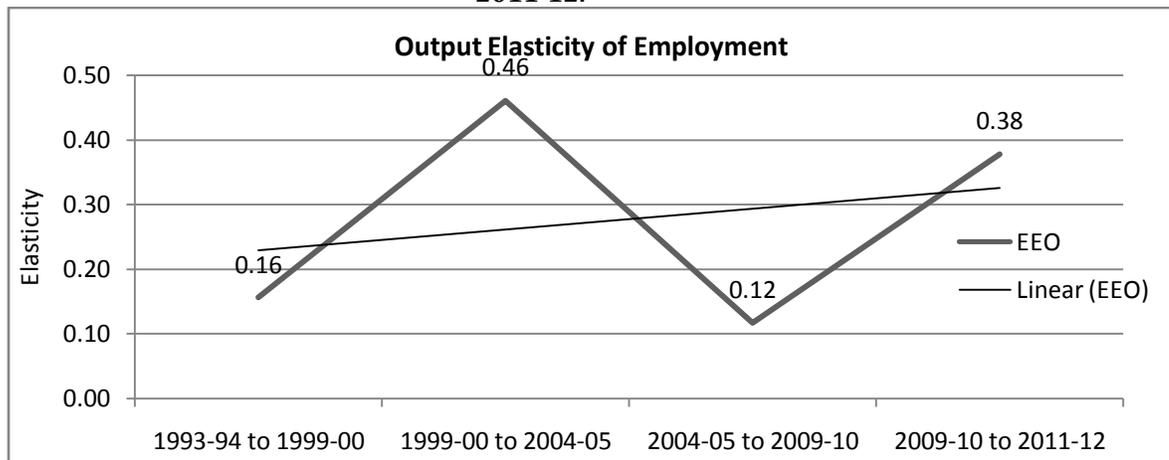
The nature of growth either 'jobless' or 'job loss' is observed by output elasticity of employment (OEE) which is defined as percentage change of employment due to percentage change of output. If $0 < OEE < 1$ the growth is 'jobless', the growth is 'job loss' if $OEE < 0$ and in case of $OEE > 1$ the growth is 'more job creating' i.e., growth of employment is higher than growth of output. The trend of OEE in West Bengal is shown Figure 6. The trend of both the growth rate of GDP and the growth of employment were upward rising and converged each other during 1993-94 to 2011-12. As a result OEE was showing upward trend in West Bengal during this period in contrast with the downward trend in India as a whole. On the whole the nature of growth is jobless in West Bengal during post-reform period.

Since 2004-05 the agriculture & allied sector, the highest employment absorber, has experienced a substantial fall of OEE as compared with the earlier period and the growth in this sector has been jobloss in nature. The fall of employment in agriculture and allied sector consequently increases the employment in secondary and tertiary sector. The OEE has gradually increased in secondary sector and during post reform period. More surprisingly the OEE in the secondary sector in West Bengal during 2009-10 to 2011-12 was 1.61 and growth was 'more job creating' in nature. Within the secondary sector the construction sector is distinct one because it has witnessed OEE more than one since 2004-05 and accordingly the nature of growth in this sectors is also 'more job creating'. The nature of growth in manufacturing sector is also 'more job creating' during the recent years. But the nature of growth in the tertiary sector and its constitutes is jobless (Table 4). That is the secondary sector has played an important role to absorb more employment during the recent years in West Bengal.

Table 4 : Output Elasticity of Employment by Sectors in West Bengal

Sectors	1993-94 to 1999-00	1999-00 to 2004-05	2004-05 to 2009-10	2009-10 to 2011-12
Agriculture& Agri-Allied	0.19	1.14	-0.58	-2.40
Mining & Quarrying	-2.24	0.19	-4.92	1.55
Manufacturing	0.07	0.10	0.57	1.02
Electricity, Gas & Water supply	0.81	-1.02	0.45	12.62
Construction	0.33	0.87	1.79	2.87
Secondary (2-5)	0.10	0.22	0.95	1.61
Trade, Hotels & Restaurant	0.81	0.29	0.25	0.11
Transport, Storage & Communication	0.62	0.42	0.29	-0.07
Other service	-0.13	0.83	0.07	0.81
Tertiary(6-8)	0.22	0.54	0.18	0.31
Non-Farm(2-8)	0.17	0.40	0.32	0.59
Total	0.16	0.46	0.12	0.38

Source: Calculation based on Table 4

Figure 6: Trend of Growth of Output Elasticity of Employment in West Bengal, 1993-94 to 2011-12.

IV. Empirical Analysis of the interrelationship among growth of SDP, growth of LP and growth of employment

The relationship among growth of output (GRSDP), growth of employment (GRE) and growth of labour productivity (GRLP) as well as OEE is analysed with the help of following Panel Data Regression Models (PDRMs).

$$GRE_{it} = \alpha_1 + \beta_1 GRLP_{it} + U_{1,it}$$

$$GRE_{it} = \alpha_2 + \beta_2 GRLP_{it} + \gamma_1 GRSDP_{it} + U_{2,it}$$

$$EEO_{it} = \alpha_3 + \beta_3 GRE_{it} + \gamma_2 GRSDP_{it} + U_{3,it}$$

$$EEO_{it} = \alpha_4 + \beta_4 GRLP_{it} + U_{4,it}$$

Where,

$i = 8$ (number of sectors as specified in Table 3 and Table 4), $t = 4$ (time periods as specified in Table 3 and Table 4). α , β , and γ are coefficients and U_s are random disturbance terms. Hence, the variations of GRSDP, GRLP, GRE, and OEE across 8 sectors over 4 time periods during 1993-2012 are estimated by PDRM. The estimated Panel Data Regression Models are given in Table 5. The growth rate of employment is a function of the growth rate of labour productivity and they are negative related (in Model 1). The variation of GRE across sector overtime inversely related with GRLP and positively related with GRSDP (in Model 2) and the relationships are statistically significant. The variation of OEE across sector overtime inversely related with GRLP (in Model 4). OEE is positively related with GRE and GRSDP and the relationships are statistically significant in Model 3. Thus growth of labour productivity adversely affects both growth of employment as well as output elasticity of employment.

Table 5 : Estimation of the Panel Data Regression Model

<i>Estimated Model</i>	<i>R</i>	<i>Wald chi²(1)</i>	<i>Prob>Chi2</i>
1. $GRE = 8.02 - 0.937GRLP^{***}(5.04) \quad (-8.29)$	0.639	68.77	0.000
2. $GRE = 1.92 + 0.98GRSDP^{***} - 1.12GRLP^{***}$ (1.01) (4.42) (-11.53)	0.784	133.23	0.000
3. $OEE = -0.36 + 0.20GRE^{***} + 0.01GRSDP^{***}$ (-0.69) (6.97) (0.16)	0.626	48.66	0.000
4. $OEE = 1.21 - 0.16GRLP^{**} (2.36) \quad (-3.87)$	0.306	15.13	0.000

*** = 1% level significant

V. Conclusions

Growth rate of output has been significantly increased during the post-reform period in West Bengal but not the growth rate of employment. Labour productivity and per capita state domestic product were upward trend and overtime they were divergent each other. The trend of work participation rate is upward rising in West Bengal in contrast with down ward trend in all over India. The period corresponding high growth of employment seems to be for the low growth of labour productivity and vice-versa. During 1999-00 to 2004-05, the growth of employment increased corresponds with decline of growth of labour productivity as compared to the earlier period. The trend reversed during 2004-05 to 2009-10. During the recent years the sectors like construction, manufacturing and electricity-gas-water have witnessed job creating growth, that is, their growth of employment outnumber the growth of output. The nature of growth is jobless in all other sectors rather than agriculture. But the nature of growth at aggregate level is jobless in West Bengal.

The growth rate of employment is positively related with growth rate of output and inversely affected by growth rate of labour productivity. The growth of labour productivity also adversely affects the output elasticity of employment in West Bengal. Our results establish conformity of the interrelationship between growth of output and employment. The populace state like West Bengal where labour force has increased at a very high rate the increase of slow growth of employment is a major concern for the policy makers and academicians. So, in economy like West Bengal with large surplus labour force, importance of an employment oriented growth is obvious. 'Jobless' or 'Job loss', growth is not the desirable form of growth.

References

Bagchi, A.K., 1998, 'Studies on the Economy of West Bengal since Independence' *Economic and Political Weekly* 33 (47, 48): 2973-78.

Choi Chang kon (2007), "The Employment Effect of Economic Growth: Identifying Determinants of Employment Elasticity", Chonbuk, National University, 2007, <https://faculty.washington.edu/karyiu/confer/busan07/papers/choi.pdf>.

Das, Pinaki. 2014, 'Productivity Nexus between Growth and Employment: Indian Experience during Pre- and Post Economic Crisis', *Journal of Bangiya Arthaniti Parishad*, Vol.23. No.1. June, 2014.

Himangshu, 2011, "Employment Trends in India: A Re-examination", *Economic & Political Weekly*, 10 September.

Hull Katy (2009), Understanding the Relationship between Economic Growth, Employment and Poverty Reduction, OECD, [https://www1.oecd.org/dac/ poverty reduction](https://www1.oecd.org/dac/poverty%20reduction)

Patnaik, P., 2011, "Economic Growth and Employment", *Economic & Political Weekly*, Vol. XLVI, Nos. 26 & 27.

Govt. of India, 2010, *West Bengal Development Report*, Academic Foundation, New Delhi.