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**EMPLOYMENT ELASTICITY OF INDIA: A STUDY OF PRE AND POST-REFORM PERIODS**

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**ABSTRACT**

The objective of this paper is to estimate the growth rates of GDP, public and private sector employment and analyse the impact of GDP growth on employment growth or the employment elasticity during the period 1970-71 to 2009-10. This period is classified into two periods viz. pre-reform (1970-71 to 1989-90) and post-reform (1990-91 to 2009-10) periods. This paper observed from the growth rate analysis that the GDP growth rate has increased from pre-reform period to post-reform period. The public sector employment growth rate has witnessed a declining trend while the private sector employment growth rate has registered an increasing trend. Further, from the regression analysis, it is examined that the employment elasticity is positive in the pre and post-reforms periods. But the post-reform employment elasticity is very insignificant when compared to pre-reform employment elasticity accounted by one per cent increase in GDP.

**KEYWORDS**

GDP, employment elasticity, growth rate, regression.

**JEL CODE**

E24, O50.

**INTRODUCTION**

Economic growth in India has generally failed to strike a desirable balance between growth of productivity and employment. During the first thirty years after embarking on the planned path of economic development, the economy, in any case, grew at a relatively low rate averaging about 3.5 per cent per annum. Major part of it was contributed by employment, which grew at about 2 per cent per annum, productivity contributing the remaining 1.5 per cent. Economic growth has been at a high rate in post-1980, and specially in post-1990 period. But it has been characterized by the other kind of imbalance: most of it has been derived from rise in productivity and only a little from increase in employment. During 1980's, of the 5.5 per cent annual growth in GDP, 2 per cent was accounted for by growth of employment, and 3.5 per cent by growth of productivity. In the 6 per cent growth achieved during 1990's, contribution of employment was only 1.8 per cent with that of productivity rising to 4.2 per cent. And during the first decade of this century, in the 7.5 per cent growth rate the respective contributions of employment and productivity have been 1.5 and 6 per cent. Thus though the relatively high growth has not actually been 'jobless', its employment content has been low and has sharply declined over the decades since 1980. (Papola, 2013)<sup>1</sup> In this background the present paper examined employment elasticity of India during pre and post-reform periods respectively.

**REVIEW OF LITERATURE**

Seyfried (2005)<sup>2</sup> examined the relationship between economic growth, as measured by both real GDP and the output gap, and employment in the ten largest states in US from 1990 to 2003. The author estimated employment intensity which ranges from 0.31 to 0.61 in specific states with an estimate of 0.47 for the US as a whole. Also, the author observed that though economic growth has some immediate impact on employment, its effects continue for several quarters in most of the states considered.

Herman (2011)<sup>3</sup> empirically investigated the effect of economic growth on employment in EU countries, between 2000 and 2010. The author found the existence of a low employment elasticity of economic growth in EU, but this has significant differences from one country to another. This fact highlights that one of the main problems of the European countries (especially those in the Eastern and Central EU) is their small capacity to generate employment under the conditions of the existence of an economic growth process. Taking into consideration that only the process of economic growth, which generates new jobs, is the one that assures the conditions for economic and human development it is highly important to act in order to increase the employment intensity of economic growth.

Leshoro (2014)<sup>4</sup> examined the employment elasticity of growth for Botswana using data over the period 1980 to 2011. The error correction mechanism (ECM), which is the short-run dynamic of the effect of changes in total and sectoral GDP on employment, gives the speed of adjustment to equilibrium given a shock in the long-run equation. The employment elasticity of growth of total GDP was found to be negatively related to employment growth, but the sectoral employment elasticity of growth was positive and quite low. The author recommended policies that encourage labour-intensive job creation rather than labour-replacing job creation, as well as employment subsidy, especially in the major sectors considered.

Misra and Suresh (2014)<sup>5</sup> observed that the aggregate employment elasticity estimates for India have declined over the decades and vary from 0.18 (arc elasticity) to 0.20 (point elasticity) during the post reform period. Sector-wise, while agriculture has witnessed negative elasticity, services including construction have generally been employment intensive. The authors concluded that employment intensive growth is crucial for India to meet the demographic dividend challenge. Basu and Das (2015)<sup>6</sup> analysed the phenomenon of jobless growth in India and the US through the lens of employment elasticity. Analytical results are derived for decompositions of both the level and change of aggregate employment elasticity in terms of sectoral elasticities, relative growth and employment shares. In India, the agricultural sector was the key determinant of both the level and change of aggregate elasticity till the early 2000s. In USA services is the most important determinant of the level of, but manufacturing remains an important driver of changes in, aggregate employment elasticity.

**OBJECTIVES**

The paper objectives are:

1. To estimate the growth rates of GDP, public sector and private sector employment growth rates during pre and post-reform periods and
2. To elasticity of employment during pre and post-reform periods.

<sup>1</sup>Papola, T.S. (2013): "Economic Growth and Employment Linkages - The Indian Experience", Working Paper, Institute for Studies in Industrial Development, New Delhi, January.

<sup>2</sup>William Seyfried (2005): "Examining the Relationship between Employment and Economic Growth in the Ten Largest States", *Southwestern Economic Review*, 32, 13-24.

<sup>3</sup>Emilia Herman (2011): "The Impact of Economic Growth Process on Employment in European Union Countries", *The Romanian Economic Journal*, XIV (42), 47-67.

<sup>4</sup>Temitope L.A. Leshoro (2014): "Empirical Analysis of Employment Elasticity of Growth in Botswana", *Mediterranean Journal of Social Sciences*, 5 (2), 171-179.

<sup>5</sup>Sangita Misra and Anoop K Suresh (2014): "Estimating Employment Elasticity of Growth for the Indian Economy", RBI Working Paper Series, Department of Economic and Policy Research, June.

<sup>6</sup>Deepankar Basu and Debarshi Das (2015): "Employment Elasticity in India and the U.S., 1977-2011: A Sectoral Decomposition Analysis", Working Paper, Department of Economics, University of Massachusetts, Amherst, July.

**DATA SOURCES AND METHODOLOGY**

The data for this paper is obtained from RBI website from 1971-72 to 2009-10 for GDP, organized employment in public and private sectors. To estimate growth rates, Compound Annual Growth Rate technique is employed. The annual compound rate of growth has been worked out applying the log-linear model for a variable say 'Y' with respect to time (t). The form of the log-linear model is:

$$\ln Y = a + bt$$

where 'b' is said to represent instantaneous rate of growth. To derive the compound growth rate, the antilog of 'b' has taken, subtract 1 from it, and multiply the difference by 100. (Shetty, 2003)<sup>7</sup>

To compute the elasticity of employment, estimate a log linear regression equation between employment and GDP that generates the point elasticity of employment. The conventional form of the equation is

$$\ln L = \alpha + \beta \ln Y$$

where variables L and Y denote employment and GDP, respectively, and ln stands for the natural logarithm of the relevant variable. Here, the regression coefficient serves as the employment elasticity. (Misra and Suresh, 2014)<sup>8</sup>

The total study period is divided into two periods, pre-reform period and post-reform period. In Section-I growth rates of GDP, public sector and private sector employments are calculated. In Section-II the impact of GDP on employment is examined through regression technique.

**ANALYSIS**

**SECTION-I**

**GROWTH RATE ANALYSIS**

The growth rates are calculated for GDP, employment of public sector and private sector. Further, the pre-reform and post-reform periods are again sub-divided into two periods viz., 1970s and 1980s in pre-reform period and 1990s and 2000s in post-reform period. The growth rates are presented in Table-1.

**PRE-REFORM PERIOD**

In 1970s, GDP growth rate has registered at 3.56 per cent while public sector and private sector employment growth rates are registered as 3.67 and 0.80 per cents respectively. In 1980s GDP growth rate has increased to 5.13 per cent from the previous decade but the employment growth rates of both public and private sectors are declined to 2.02 and 0.10 per cent respectively. The overall growth rates for the pre-reform period for GDP, public and private sector employments are 4.19, 2.74 and 0.60 per cents respectively. Except insignificance of 1980s private sector employment growth rate, all the other growth rates are statistically significant at one per cent level.

**POST-REFORM PERIOD**

In 1990s, the growth rate of GDP has noticed as 6.18 per cent while the public and private sector employment growth rates are recorded as 0.10 and 1.61 per cents respectively. In 2000s, the GDP growth rate has increased to 7.79 per cent while the public and private sector growth rates are also noticed an increasing trend and recorded as 0.80 and 2.84 per cents respectively. The overall post-reform period growth rates of GDP, public sector and private sectors are 6.61, 0.50 and 1.31 per cents respectively. All the growth rates are statistically significant at one per cent level except the public sector employment growth rate in 1990s, which is insignificant.

From the above growth rate analysis, it is observed that the GDP growth rate has increased from pre-reform period to post-reform period. The public sector employment growth rate has witnessed a declining trend while the private sector employment growth rate has registered an increasing trend.

**TABLE-1: GROWTH RATE REGRESSION RESULTS OF GDP, ORGANIZED PUBLIC AND PRIVATE SECTORS EMPLOYMENT**

PERIOD	YEAR	VARIABLE	$\alpha$	t ( $\alpha$ )	p	$\beta$	t ( $\beta$ )	p	R2	CAGR
PRE-REFORM PERIOD	1970s	GDP	8.612	508.532	.000	0.035	12.673	.000*	0.953	3.56
		Pub emp	2.391	175.653	.000	0.036	16.613	.000*	0.972	3.67
		Pvt emp	1.892	152.203	.000	0.008	3.913	.004*	0.657	0.80
	1980s	GDP	8.300	732.345	.000	0.050	25.661	.000*	0.988	5.13
		Pub emp	2.751	244.135	.000	0.020	10.877	.000*	0.937	2.02
		Pvt emp	2.000	296.575	.000	0.001	0.812	.440	0.076	0.10
	1970-1990	GDP	8.574	578.590	.000	0.041	33.136	.000*	0.984	4.19
		Pub emp	2.441	170.623	.000	0.027	22.692	.000*	0.966	2.74
		Pvt emp	1.903	218.844	.000	0.006	8.772	.000*	0.810	0.60
POST-REFORM PERIOD	1990s	GDP	9.411	733.873	.000	0.060	28.810	.000*	0.990	6.18
		Pub emp	2.956	659.757	.000	0.001	1.913	.092	0.314	0.10
		Pvt emp	2.022	155.896	.000	0.016	7.716	.000*	0.882	1.61
	2000s	GDP	9.952	645.262	.000	0.075	30.327	.000*	0.991	7.79
		Pub emp	2.945	388.756	.000	-0.008	-6.299	.000*	0.832	-0.80
		Pvt emp	2.052	60.055	.000	0.028	5.144	.001*	0.768	2.84
	1990-2010	GDP	9.381	606.159	.000	0.064	49.484	.000*	0.993	6.61
		Pub emp	2.989	358.316	.000	-0.005	-7.721	.000*	0.768	-0.50
		Pvt emp	2.025	83.824	.000	0.013	6.325	.000*	0.690	1.31

Source: Author's calculation using the data from RBI website.

Note: \*indicates significant at 1% level.

**SECTION-II**

**REGRESSION ANALYSIS**

To analyse the impact of growth of GDP on employment growth or employment elasticity regression analysis is carried out for the pre-reform as well as post-reform period and also for the sub-periods. To arrive at overall employment here both public sector and private sector employments are combined. The regression results are presented in Table-2.

During 1970s, employment elasticity is positive as the regression coefficient of GDP turns out to be positive and significant at one per cent level. The magnitude of employment growth is 0.72 per cent. During 1980s also positive employment elasticity has noticed and significant at one per cent level. But the magnitude of increasing employment for one per cent increase in GDP growth has declined to 0.27. In the pre-reform period the regression coefficient of GDP is positive and significant at one per cent level. The magnitude of employment elasticity is 0.48 per cent.

During 1990s, the regression coefficient is positive and significant at one per cent level. In this period employment elasticity is estimated as 0.09 per cent. During 2000s also the positive employment elasticity continues but at a slower pace as the value of the regression coefficient is (0.06) lesser when compared to the previous period. The regression coefficient is statistically insignificant. In the post-reform period even though the regression coefficient indicates the positive employment elasticity but in terms of magnitude it is not considerable (0.01). The regression coefficient is statistically not significant.

<sup>7</sup>Shetty, S.L. (2003): "Growth of SDP and Structural Changes in State Economics – Interstate Comparisons", *Economic and Political Weekly*, 38 (49), 5189-5200.

<sup>8</sup>Sangita Misra and Anoop K Suresh (2014): *op. cit.*

From the above regression analysis, it is examined that the employment elasticity is positive in the pre and post-reforms periods. But the post-reform employment elasticity is very insignificant when compared to pre-reform employment elasticity accounted by one per cent increase in GDP.

TABLE 2: REGRESSION RESULTS OF GDP ON EMPLOYMENT

Regression Equation: $\ln \text{Emp (Y)} = \alpha + \beta \ln \text{GDP (X)}$								
PERIOD	YEAR	$\alpha$	$t(\alpha)$	$p$	$\beta$	$t(\beta)$	$p$	R2
PRE-REFORM PERIOD	1970s	-3.379	-4.948	.001	0.726	9.357	.000*	0.916
	1980s	0.692	2.818	0.023	0.274	10.268	.000*	0.929
	1970-1990	-1.221	-4.137	.001	0.481	14.688	.000*	0.923
POST-REFORM PERIOD	1990s	2.392	15.054	.000	0.095	5.830	.000*	0.809
	2000s	2.611	7.697	.000	0.067	2.056	.074	0.346
	1990-2010	3.212	22.718	.000	0.010	0.720	.481	0.028

Source: Author's calculation using the data from RBI website.

## CONCLUSION

This paper observed from the growth rate analysis that the GDP growth rate has increased from pre-reform period to post-reform period. The public sector employment growth rate has witnessed a declining trend while the private sector employment growth rate has registered an increasing trend. Further, from the regression analysis, it is examined that the employment elasticity is positive in the pre and post-reforms periods. But the post-reform employment elasticity is very insignificant when compared to pre-reform employment elasticity accounted by one per cent increase in GDP.

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