PROGRESSIVE INDIA IN OUTPUT AND EMPLOYMENT

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ABSTRACT

Keeping in view, the limitations present in literature, we try to analyze for, the pattern of growth of output and employment and its determinants in Organised Manufacturing Sector in India. States which contribute to more than eighty percent of the total output and employment in India are considered. We use Gross Value Added and Total Output for the indicator measuring for Output. Total persons engaged and Labour Index are the indicators for Employment. This is one of our major contributions to literature. The research design of the study is based on secondary data. The findings reveal the impact of New Economic Policy across India as a whole and the impact of Global financial crisis across selected states. Liberalization has been able to make a significant positive impact while Global financial crisis had no effective impact. Employment growth has been positive after liberalization. This has also been observed through structural breaks. Over the period of Study, there has been increase in the number of states with a rising growth rate. Output Elasticity of employment has proved the job creating capability of each state as of India as a whole. In addition to these, we have observed the effect of determinants of output and employment growth across States. Thus, our work is a concise study on the two main parameters of the Indian economy which shall enrich the existing literature as well as policy makers for progressive development and a sustainable development of our nation.

KEYWORDS

Gross Value Added, Labour Index, Structural Break, Convergence

1. INTRODUCTION

1.1. Introduction

Output and employment are two critical measurements which help in estimating the progress of an economy. Increase in output indicates increase in productive ability of the economy. The increased output shall bring in a huge amount of income which would increase national income. This again creates an increase in aggregate demand. The increase in aggregate demand shall motivate the producers to increase output further as it shall increase revenue earnings and aggravate profit. To make this possible the producers shall increase the most easily available form of variable factor; labour. Employment now makes its way inside the macroeconomic market scenario. Increase in employment shall further increase purchasing power and thus aggregate demand. We can very well observe that both the macroeconomic variables are simultaneously related. Improvement in one causes the improvement of the other as well. Both provide a win-win situation for the economy.

There are various factors that contribute to enhancing growth of output as well as employment, individually as well as joint determinants. We give major stress on the total factor productivity growth, capacity utilization and capital as determinants of output growth. Again, lagged value of labour and output are the considered determinants of employment growth. Technology is the

common determinant of both the dependent variables. There are numerous other factors worth mentioning as determinants of output growth and employment growth. We shall try to branch out our focus as a state level analysis. This prevents us from the use of various trade related variables.

Owing to the geographic location of the states, there are differences in the type of organized manufacturing sector capable of flourishing in each location. Thus we need to identify the intensity of employment in the manufacturing sector in each of the states. This shall help in providing the policy makers a clear perception of employment creation capability of the organized manufacturing sector in each state.

The paper tries to analyse the pattern of growth of output and employment. It then turns to identifying the determinants of output growth and employment growth and their relationship. The analysis covers a time horizon of 1980-81 to 2018-19.

1.2. Plan of Study

The review of literature includes gaps remaining the existing literature, the motivation behind our work, the research problem dealt with in the thesis. We then deal with objectives and the hypothesis. This is followed by Data Sources and Methodology used in our study. Pattern of growth of Output and Employment is a separate section of our research. It includes selection of states, analysis of growth rates, identifying structural breaks and fluctuations. We perform Rank correlation between the variables of output and employment. The chapter ends with estimates of Output elasticity of employment. Analysis of the presence of convergence across the States in India with respect to output and employment is another aspect of our research. We then estimate output growth function and employment growth function. We end with summary and conclusions thus obtained from the results. A list of references concludes the paper.

2. REVIEW OF EXITING LITERATURE

2.1. Existing Studies on output and employment growth

Goldar, B. (2000) has put forward a paper of short length to analyze the pattern of growth in employment based on the organized manufacturing sector. It identifies some of the factors that can cause acceleration in employment growth. An explanation of the stagnation in employment in the organized manufacturing sector in the year 1980s was of focus in the article. It was observed that the growth was due to change in the size structure in favour of small and medium industries and the slowdown in the growth in real wages. Alessandrini (2009) has a different viewpoint for the jobless growth problem in India. The author concludes that capability of new job opportunity generation in organised manufacturing is limited owing to the reduction in employment elasticity to aggregate output in manufacturing sector. Furthur rising inequality across states and othe related factors forces maufacturing employment to remain low. Aranca(2010) has constructed a report in consultation with India Brand Equity Foundation. On an underlying study of India's manufacturing sector, its contribution to overall employment and its role in Employment Generation, the report has put forward certain inferences. It states the presence of lag as it has ability to absorb excess labour from the agriculture sector and shift the same to services, which makes it the driving force in development process of an economy. Goldar (2011a) has proposed a possible account for a high rate of job creation in organized manufacturing since 2003. Structural changes in the organized sector may have been in favour of labour intensive industries or enterprises contributed marginally to high growth rate in industrial employment. Goldar (2011b) was a counter argument of a comment in a preceding article by R. Nagaraj who argued that the potraying boom in employment in 2003-04 to 2008-09 in the manufacturing sector may not have

a significance in the progressive structure of the economy as it could be the recovery of lost employment in the preceeding years of 1998 to 2003-04. The argument was furthur put up with a proof of insignificant estimate of correlation coefficient between employment elasticity and labour reforms. Rastogi (2011) has made an extensive research work on Industrial Growth and Employment across states in India and overall. The period of observation was 1972-73 to 2004-05. Providing an overview of three theories of growth approach concerning income and employment; The impact of physical and social infrastructure on Industry basis is a very important feature that has been gone through. Papola, T.S., and Sahu, P.P. (2012) paper had tried to describe the growth and structural changes in employment in the long and short period. Special focus has been provided by them on the period since economic liberalization. The paper concluded with the indication of some broad measures of policy in order to bring about faster growth of productive and decent employment. Aggarwal, H.et.al. (2018) has made an extensive work in her doctoral thesis on the performance observed by the secondary sector, manufacturing in particular. Her work mainly encompasses the calculation of elasticity of substitution between the two main factors of production, capital and labour in Indian manufacturing industries. It has been observed that the potential of progress in the sector is quite a lot. The period of observation of the study was 2003-04 to 2012-13. Basole, A. and Narayan, A.(2018) investigates the organised manufacturing sector and its trends with respect to variables such as employment, output, labour-capital ratio, wage rates and wage share. The study is done on three digit data over the period 1983 to 2016. The conclusions drawn from the paper include , with increase in productivity, industries have varying ability to create jobs and deliver wage growth. Behara D.K.(2019) examined the dynamics of employment in the organized and organized segment of Industrial sector. Empirical estimates have been obtained of various relevant variables from 1972-73 to 2011-12. Keynesian viewpoint has been put to use to explain the growth in employment as a function of output growth, income sourcing non-industrial sector, industrial output of previous years, investment, import of non-agricultural form, productivity of labour, ratio of capital to output and export. The author concludes that there is a necessity of capital formation to rise faster than rise in productivity and capital-labour ratio for a positive growth in employment. Fluctuative employment growth has been reflected through falling employment elasticities with respect to output; which returns a positive value, and investment; which returns a negative value. Growth in employment is sustained by an increase in capital accumulation overtime. Analysis of pre and post reform period reports a success in employment growth in the unregistered component of the manufacturing sector. The paper surmises that employment creation is affected inversely by growth in capital output ratio and labour productivity; again it is directly related to demand side factors such as output and capital formation.

2.2. Existing studies on Total Factor Productivity Growth

Chattopadhay,(2000) seeks to examine the overall industrial scenario of West Bengal for the past three decades. The paper studies the productivity of capital and labour for the two-digit industry groups and the total factor productivity (TFP) of the manufacturing sector of West Bengal as a whole *vis-à-vis* all-India and also for some selected groups of industries for West Bengal. West Bengal has lost its earlier status of one of the highly industrialised States of the country. Balakrishnan, P and Pushpangadan, K., (1994)Productivity estimates are sensitive to the measure of real value added that is adopted One source of bias in estimation is that due to the assumption often made of constancy of the relative price of material inputs. This paper provides estimates of total factor productivity for Aggregate Manufacturing having adjusted for changes in this relative price. These results indicate that, contrary to what is believed, productivity growth in the 1960s may, actually, have been slower than in the earlier decade. Dholakia,B.H. and Dholakia,R.H., (1994) In reference to the argument placed by Balakrishnan and Pushpangadan about the sensitivity of Total Factor Productivity to real value added, in the present note we would like to show that (1) the qualitative conclusion about the behaviour of TFPG in the Indian manufacturing

industry over time, particularly during the 80s as compared to the 70s. does not change if sufficient care is taken about applying the double deflation method; and (2) the double deflation method per se is not necessarily superior to the single deflation method. Pal, M.K. (1996) in his book has provided a fullscape analysis of total factor productivity across a few major organised manufacturing industries. He has performed a comparative analysis on three methodologies of estimating the same and trying to figure out the best among them. It is a comprehensive study. Commendable work has been performed on all india data which opens up to futhur research. Other authors include Rao, (1996) , Das, D.K. (2003), Veeramani,C. and Goldar,B. (2004), Deb, A.K. and Ray, S.C., (2014), Baliyan,S.K.et.al (2015), Krishna K.L. et. al. (2018), Aneja,R. and Arjun, G., (2021) and many others contrbuting to the literature on employment.

2.3. Existing studies on capacity utilization in Indian Manufacturing industries

Ragan,J.F. (1976) made an effort to obtain the best estimate of capacity utilization. The author found that manufacturing sector is underutilizing its capacity. The rates of capacity augmenting investment and rate of production in the forthcoming periods shall determine the emergence of problem with capacity. The available capacity shall not be a hindrance in the near future of the period of study. Bottlenecks in isolated lines of production, available capacity throughout the manufacturing sector is sufficient in the short run. Corrado,C. and Mattey,J, (1997) states that the construction of capacity utilization, like the construction of almost any macroeconomic statistic, involves a combination of people answering surveys and government statisticians aggregating their responses and other data into a single number that can be second-guessed. Yet the concept of capacity utilization continues to play a useful role in our thinking and analysis of the inflationary process. Movements in capacity utilization can be taken as stemming primarily from shocks to aggregate demand, which push the economy along an upward-sloping aggregate supply curve. The notion that inflation begins to accelerate when capacity utilization exceeds a threshold near 82 percent has been quite firm over the decades. Ray,S and Pal, M.P. (2004) in their paper had measured the performance of the economy with respect to Indian Fertilizer Industry. They have made an aggregate level study. Tranlog specification has been used for analysis over the period 1979-80 to 2003-04. Post liberalization has provided a negative impact on productivity as a negative trend was observed. An estimate of capacity utilization has been used to estimate the productive performance of the economy. The trend of capacity utilization also shows a negative trend. Other authors contributing to the literature include, Christiano (1981) ,Ray, (2011), Hait,A. and Paul,R.P., (2014) , Madhavan.M, and Kumaravelu.M, (2014) , Bhatia,A. and Kaur,B., (2016), Gangadaran, V. and Majumdar,S., (2021) , Wang,H. and Li,B (2021) . Numerous other studies contribute to our work all of which has not been mentioned.

3. OBJECTIVES

3.1. Research Gap

There is a dearth of literature discussing on the significance of the pattern in trend followed by income and employment. The indicators of employment growth and output are common in most researches. Most have used Gross Domestic Product, Net Domestic Product etc. But, the use of Gross Value Added is not quite available. A study providing a comparative analysis of the various economic growth indicators have rarely been performed. State-level analysis has not been performed as intensely as required in order to help the policy makers analyse the success of implementation of various forms of amendments to laws. Despite, Manufacturing sector is unanimously declared to be a critical employment generation sector which shall make India self sustaining, an intensive research on the determinants of growth and employment in the sector has not been performed. ASI Data has not been used as much in literature for the estimation of

pattern of employment and output. Thus, we focus on this source to identify the differences in results.

3.2. Motivation behind the work

Keeping in mind the research gaps, an effort has been made to contribute to literature. A futile exercise is performed by not focusing on the economic significance behind the presence in structural breaks, the determinants which help to promote employment and enhance growth. Our research work has followed this lead as the motivation to work. A comparative study to identify a proper and functional all-rounder macroeconomic indicator to measure the performance of employment and output is being stressed in the research work.

3.3. Research problem

Focusing on the time period under analysis, we analyze the Pattern of growth and employment across States in India and estimate their determinants in Organised Manufacturing sector in India.

1. To examine the pattern of growth of output and employment across major manufacturing states vis-à-vis All India.
2. To identify and estimate the determinants of output and employment across major manufacturing states vis-à-vis All India.
3. To identify structural breaks at particular years in economic growth and employment across States in India.
4. To identify the ideal variable successful in providing the best estimate of output and employment among Real Gross Value Added, Real Output, Total Persons engaged and Labour Index.
5. Identify the presence of convergence in output and employment across States

3.4. Hypothesis

The null hypothesis is as follows:

- There has been a positive impact on output and employment in All India with respect to New Economic Policy, 1991-92.

4. DATA SOURCES AND METHODOLOGY

4.1. Data Sources

The research is based primarily on Organised Manufacturing sector. The special categorization of industries is ignored and thus National Industrial Classification of Industries is not considered. For All India analysis, we study for 39 consecutive years (1980-81 to 2018-19). Analysis of States is done for 22 consecutive years. The origin of the data is a single source which makes us select our time period of analysis accordingly. Secondary data is used in our analysis. They are enumerated as follows:

1. Ministry of Statistics & Programme Implementation ; http: //mospi.gov.in
   1.1. ASI (Annual Survey of Industries) in its various issues from Government of India provides data on output, employment, capital.
   1.2. NAS (National Accounts Statistics) provided data on Gross State Domestic Product and Gross Domestic Product; Central Statistical Organisation (CSO).

2. A private data package: CMIE
   Centre for Monitoring Indian Economy Reports and Economic Surveys; http://www.cmie.com
3. Several issues of Statistical Abstracts.
4. Several issues of State Economic Surveys.
5. Reserve Bank of India; http://www.rbi.org.in
   Handbook of Statistics on Indian Economy.

4.2. Selection of variables

Output being a variable, splicing and base shifting techniques are used.
The values of Real GVA and Real TO (in deflated terms).

Real GVA = $\frac{\text{GVA (from secondary data otherwise considered as Nominal GVA)}}{\text{GDP Deflator}}$

Real TO = $\frac{\text{TO (from secondary data otherwise considered as Nominal TO)}}{\text{GDP Deflator}}$

We have considered two measures of labour input for our research purpose, Total Persons Engaged (PE) and Labour Index (LI). Labour Index (LI) is calculated in the following manner:
LI = Expenditure on Workers + Expenditure on Other Employees (Employees other than workers).
Expenditure on Workers = Total Number of Workers x Wage Index of Workers
Expenditure on Other Employees = Total Number of Other Employees x Wage Index of Other Employees
Wage Index of Workers = Ratio of (Wages to Workers) to (Total Emoluments)
Wage Index of Other Employees = Ratio of (Wages to Other Employees) to (Total Emoluments).

Capital input , K = $\frac{\text{GFCS}}{\text{Capital Deflator}}$

Where, Capital Deflator = $\frac{\text{GFCF at current year}}{\text{GFCF at base year}}$, the ratio of GFCF at current prices to that of constant base year prices.
Dummy variable has been used in regression analysis. For All India analysis, the value dummy variable is considered as zero (0) in the pre-liberalisation period (before 1991-92) and one (1) for the post liberalization period (after 1991-92). For state level analysis the period till which the dummy variable takes zero is 2008-09, and the rest of the years be one.

4.3. Methodology

4.3.1. Measures of Growth

Decadal growth rate: $G_{10Y} = [\{((Y_t - Y_{t-10})/Y_{t-10})\}*100]$

Point-to-point growth rate: CAGR = $e^{\left\{\frac{\ln\left(\frac{Y_t}{Y_0}\right)}{t}\right\}-1}$

Year- to- year growth rate: $G_Y = [\{(Y_t - Y_{t-1})/Y_{t-1}\}*100]$
Annual Average Growth Rate: $G_{AAG} = [\{((Y_t - Y_0)/Y_0)/t\}*100]$
Reform based growth rate: $G_R = [\{((Y_t - Y_R)/Y_R)\}*100]$

4.3.2. Analysis of employment generation

Output elasticity of employment and nature of growth:
Output elasticity of employment (OEE) = Growth of Employment/ Growth of output.(Aich, 2017)[1]
The nature of growth is specified by the value of EEO.

If, OEE <0, the growth is job loss in nature
0≤ OEE <1, the growth is job-less
OEE ≥1, the growth is job-creating.(Pinaki, 2010)

4.3.3. Structural break

We use multiple breaks in parameters with an unknown breakpoint:
One of the familiar tests regarding multiple breaks is Bai-Perron test. In this test model the goal is to find out the location of several break points where the break points are considered to be unknown. We have to accept that one for which minimum information criterion is needed.

4.3.4. Fluctuation in output & employment

Coppok (1962) has used the following formula to measure year to year fluctuation in a time series data:

F_{coppok} = Exp (SD ($\ln(\frac{Yt+1}{Yt})$)

Where Exp is expected value and SD is standard deviation.
The coppock measure has a lower limit of one with no upper limit.

4.3.5. Measurement of Productivity

Partial Factor Productivity measures output against a specific input. Labor productivity is a single factor productivity measure. It is the ratio of output to labor input. Capital productivity is the ratio of output to capital input. It can be measured quantitatively using the following formula:

$PFP_L = \frac{Y}{L}$ and $PFP_K = \frac{Y}{K}$

where PFP_L is partial factor productivity of labour, PFP_K is partial factor productivity of capital, Y is the output , L is labour input and K is the capital input.
Linear model considered for total factor productivity estimation is:

$\ln Y = \alpha_0 + \alpha_1 \ln K + \alpha_3 T + \frac{1}{2}\beta_{11}(\ln K)^2 + \frac{1}{2}\beta_{22}(\ln L)^2 + \frac{1}{2}\beta_{33}T^2 + \beta_{12} \ln K.\ln L + \beta_{13}\ln K.T + \beta_{23} \ln L.T$

4.3.6. Measurement of Capacity Utilisation

The basic assumption while estimating Capacity Utilisation is a 3 x 1 model of a rational firm economy in the short run. Capital here acts as quasi-input. An implicit production function is used in our analysis,

$Y = f(K, L, E)$

Capacity Utilisation is a rate represented as a ratio of actual output to capacity output, CU = Y/Y* . Method for measuring energy intensity considers value of energy consumption per unit of value of output is energy intensity. The rate of energy intensity may be greater than or lesser than zero. Efficient use of energy is indicated by the rate being negative.

4.3.7. Tests of Causality

Granger Causality is a test to check whether the lags of one variable enter into the equation for another variable. The direct way to test Granger causality is to use a standard F test of the restriction. In this respect the hypothesis to be tested is as follows:

$H_0 : \sigma_1 = \sigma_2$ (Presence of equal variances in the two bifurcated time periods under study)
$H_1 : \sigma_1 \neq \sigma_2$ (Presence of unequal variances in the two bifurcated time periods under study)

4.3.8. Measure of Convergence

For σ convergence, we at first try to test the presence of convergence using standard deviation approach where we plot a trend line against all the time-period observed. We use co-efficient of variation to test for sigma convergence which same results as that of S.D. At last we use F- test to check the significance of our result.

We test for absolute β- convergence by using trend line analysis, we use the CAGR(Compound Annual Growth Rate) where it is plotted against the Average PCSDP of initial three years of the observed period. A negative relationship implies the presence of convergence. (Somasekharan and Roy,2011).

We regress the point-to point growth rate of per capita income of the entire time period observed to the growth rate of initial three years, the negative relationship of which implies the presence of convergence.

For the analysis of Stochastic convergence**,** we have used the following model
Z_{it}=Ln (nPRGVAit/∑PRGVAit), i=1 to n for ∑.(Strazicich et.al;2004)
n= number of years in the group.
Unit root tests are to be carried out on the deviation series of Z_{it}.
Thus the negative significant value of the test statistic under the null assumption of stationarity implies beta convergence.

6. RESULTS AND DISCUSSION

5.1. Selection of States under study

The research conducted is a State-level analysis. Manufacturing Sector being our main focus, selection of the field of study is done with purposive sampling. Examining the contribution in share of employment and the share of output by the states to average gross employment and output in India has been the chief determinant in selection of the states considered in our study. The states so considered are Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Haryana, Punjab, Madhya Pradesh.

5.2. Study on pattern of output and employment

We examine the pattern of output and employment growth by estimating numerous growth rates. The decadal growth rate show that in the first decade the growth has increased marginally (1.17) followed by a huge fall in the next decade, which is more than twice (-2.17). The following decade experienced growth which overpowered the fall by a marginal amount (2.89). The last eight years followed with a huge fall overpowering the recovery (-3.23). A much better observation is available for employment, where the first decade shows a minute growth (0.07) but the next decade experienced a relatively larger fall (-0.35). The most progressive decade follows next with a growth rate of more than 5 times (5.89), but the next eight years has a fall (3.53). With respect to employment, we observe that there has been a commendable growth (0.07 to 3.45). Trend growth rate shows a decrease (-0.16), where employment grew (0.98). There have been similar fluctuations in the CAGR. Similarly growth rates have been observed for the states under study with similar fluctuating patterns.

Table 5.1: Annual Growth rate frequency table

Period	Less than 0	0.1 to 5	5 to 10	Total States
1998-99 to 99-00	5	6	2	13
1999-00 to 00-01	6	3	4	13
2000-01 to 01-02	2	6	5	13
2001-02 to 02-03	4	7	2	13
2002-03 to03-04	5	6	2	13
2003-04 to 04-05	6	3	4	13
2004-05 to 05-06	2	6	5	13
2005-06 to 06-07	4	7	2	13
2006-07 to 07-08	5	6	2	13
2007-08 to 08-09	6	3	4	13
2008-09 to 09-10	6	3	4	13
2009-10 to 10-11	2	6	5	13
2010-11 to 11-12	1	7	6	13
2011-12 to 12-13	7	3	3	13
2012-13 to 13-14	2	6	5	13
2013-14 to 14-15	1	7	6	13
2014-15 to 15-16	7	3	3	13
2015-16 to 16-17	6	5	2	13
2016-17 to 2017-18	2	6	5	13
2017-18 to 2018-19	4	7	2	13

Source: Author's own calculations

Similarly frequency table has been generated for employment across states in India.

The methodology of structural break and fluctuations confer that there has been existence of structural breaks 1993-94, 2010-11 among numerous other breaks. These two were worth mentioning as a lag to the New economic policy. There has been changes in fiscal policy owing to which there was break in the subsequent periods. Similar results were obtained in the case of States, owing to various changed in government policies and exogenous shocks. All variables under analysis have been observed to be stationary. There is no Endogenity among the variables. Estimated Total factor productivity growth rate provide a series of values ranging from +0.01 to -0.01. The average annual total factor productivity value has the value of -0.004 for all India. As for states the same range is maintained. The series of value obtained for capacity utilization is within an open interval of -1 to +1. The spearman rank correlation coefficient was 0.64 approximating to 1, which implies that for employment and output we have variables which provide us similarity in results, thus we shall use real GVA and Total number of persons employed as better estimates. India as a whole is facing Job-less growth.

Table 5.2: Analysis of Output Elasticity of Employment

1998-99 TO 2018-19	Rising from Job Loss Growth	At and around Job Less Growth	Tending to More Job growth	Tot. States
Number of states	7	4	2	13

Source: Author's own calculation

We have observed the presence of sigma and beta divergence, along with stochastic convergence across the states under consideration.

5.3. Study on determinants on growth of output and employment.

All India level estimation of output growth and employment growth functions.
Output growth equation:
Ln Y =a+b X+ cM + d TFPG + e CU+ f Tr + g Er +h ToT + iπ + j Ifm + k Gm +l FDI+Dt

Table 5.3 Results of regression

Independent Variable	**Coefficient**	**Z-value**	**Probability**
X (Export output ratio)	-0.089	-4.44	0.00
M (Import penetration ratio)	0.109	2.08	0.038
TFPG (Total Factor Productivity Growth)	0.005	0.68	0.496
CU (Capacity utilization)	0.002	0.56	0.56
Tr (Tariff Rate)	0.0001	1.46	0.145
Er (Real Effective Exchange Rate of Indian Rupee)	-0.0004	-2.26	0.024
ToT (Terms of Trade)	-0.00004	-1.27	0.204
π (Inflation)	0.00045	1.15	0.249
Ifm (Investment in Fixed Machinery)	0.0047	0.63	0.526
Gm (Gross Markup value)	0.109	4.61	0.00
FDI (FDI)	-4.45E-05	-1.87	0.061
Dt (Dummy)	0.0039	0.45	0.06
CONSTANT	0.0271	0.97	0.332
No of observations 273	R2 within	0.707	
	R2 between	0.626	
	R2 overall	0.666	
	Wald $\chi 2$	245.48	
	Prob $\chi 2$	0.00	

Source: Author's own calculation
The results confirm that New Economic Policy has provided a positive significant impact on output growth across states in India.

Table 5.4: State level estimation

Variable	Definition	States						
			Madhya Pradesh	Tamil Nadu	Uttar Pradesh	Punjab	Andhra Pradesh	Haryana
X	Export-Output Ratio	Co-efficient		-0.14416	0.243711	-0.04577	0.37	0.5
		P-value		5.3923E-05	0.00968	0.087166	0.00	0.00
M	Import – Penetration Ratio	Co-efficient						
		P-value						
TFPG	Total Factor Productivity growth	Co-efficient				-0.02427		
		P-value				0.000464		
Tr	Tariff rate	Co-efficient		8.60E-05	0.00024		0.0003	0.00054
		P-value		0.038944	0.043242		0.05	0.03
CU	Capacity Utilization	Co-efficient		-0.00026	-0.00071	-0.00073	-0.0002	-0.00069
		P-value		0.002013	0.000142	2.19E-06	0.0001	0.000
Er	Real-effective exchange rate	Co-efficient		0.000126				
		P-value		4.19E-07				
ToT	Terms of trade	Co-efficient	-0.0007	-0.00025				
		P-value	0.070379	0.09053				
π	Inflation rate	Co-efficient	0.193288					
		P-value	2.89E-10					
Ifm	Investment in fixed assets	Co-efficient			50.5866		50.01	35.23
		P-value			0.000231		0.000	0.000
Gm	Gross-mark-up	Co-efficient	-8.3E-07	-6.29E-07		-3.58E-07		
		P-value	1.66E-08	1.00E-08		0.026186		
FDI	FDI	Co-efficient		0.007855	-0.01917	-0.02234	-0.01	-0.02
		P-value		0.005429	0.031162	0.000166	0.03	0.06
Dt	Dummy Variable	Co-efficient	-0.02095	-0.01282	0.01949	0.084716	0.02	0.02
		P-value	1.6E-07	0.155919	0.50449	3.31E-07	0.5	0.18

Source: Author's own

These are single time series estimates for each state. The table provides us the result that global financial crisis has not offered any significant changes in the growth across states in output in India.

Table 5.5. All India Employment Growth (1990-91 base)

Summary Statistics	***Regression Statistics:ALL INDIA (1990-91 BASE): Significant impact of liberalisation on Employment***			
	Multiple R	0.99	Adjusted R Square	0.98
	R Square	0.98	Observations	38
Model 1 *Log TPE=f(log W/P, log RGVA, log TPE-1, Dt)*	*F*	407.2958		
	Significance F	1.41E-27		
		Coefficients	*t Stat*	*P-value*
	Intercept	1.99	1.77	0.09
	LNRW	-0.27	-6.61	0.00
	LNRGVA	0.24	4.72	0.00
	LNTPE-1	0.47	5.15	0.00
	T	-0.06	-3.25	0.00
Model 2 *Log TPE=f(log W/P, log RO, log TPE-1, Dt)*	*F*	385.54		
	Significance F	0.00	0.25	0.81
		Coefficients	*t Stat*	*P-value*
	Intercept	0.34	4.86	0.00
	LNRW	-0.18	-4.40	0.00
	LNRO	0.28	6.49	0.00
	LNTPE-1	0.57	-3.05	0.00
Model 3 *Log LI=f(log W/P, log RGVA, log LI-1, Dt)*	F	171.54		
	Significance F	0.00		
		Coefficients	t Stat	P-value
	Intercept	-	-	-
	LNRW	-0.19	-5.44	0.00
	LNRGVA	0.24	3.84	0.00
	T	-0.08	-3.34	0.00
	LNLI-1	0.57	6.08	0.00
Model 4 *Log LI=f(log W/P, log RO, log LI-1, Dt)*	*F*	148.98		
	Significance F	0.00		
		Coefficients	t Stat	P-value
	Intercept	-	-	-
	LNRW	-0.10	-3.20	0.00
	LNRO	0.22	2.96	0.01
	T	-0.06	-2.63	0.01
	LNLI-1	0.72	8.03	0.00

Model 1:

t-statistics are in paranthesis. The summary statistics of the model provides Goodness of fit, R^2 = 0.98, Adjusted R^2: $\overline{R^2}$ = 0.98. The number of observations is 38. F-statistic value is 407 and is significant at 1% level. The coefficient of Log $(\frac{W}{P})$ is expected is positive. This implies that increase in real wages induce workers to get engaged in the manufacturing sector. The coefficient of Log RGVA is positive (0.24). This implies that increase in output shall induce employers to

absorb more workers to increase production. The coefficient of Log TPE_{-1} is expected to be between zero and one. We have a significant result. This indicates the presence of significant lag in the adjustment of actual employment to its desired level. The coefficient of D_t is negative. This is significant. This means that there is negative impact of liberalization on employment creation in Organised manufacturing sector. Our results are supported by studies made by Basole,A. and Narayan,A. (2020)

Model 2

The summary statistics of the model provides Goodness of fit, $R^2 = 0.98$, Adjusted R^2: $\overline{R^2} = 0.98$. The number of observations is 38. F-statistic value is 385.54 and is significant at 1% level. The coefficient of The coefficient of Log $(\frac{W}{P})$ is expected is positive. This implies that increase in real wages induce workers to get engaged in the manufacturing sector. The coefficient of Log RO is positive (0.28). This implies that increase in output shall induce employers to absorb more workers to increase production. The coefficient of Log TPE_{-1} is expected to be between zero and one. We have a significant result. This indicates the presence of significant lag in the adjustment of actual employment to its desired level. The coefficient of D_t is negative. This is significant. This means that there is negative impact of liberalization on employment creation in Organised manufacturing sector. Our results are supported by studies made by Basole,A. and Narayan,A. (2020)

Model 3

The summary statistics of the model provides Goodness of fit, $R^2 = 0.96$, Adjusted R^2: $\overline{R^2} = 0.95$. The number of observations is 38. F-statistic value is 171.54 and is significant at 1% level. The coefficient of Log $(\frac{W}{P})$ is expected to be positive. This implies that increase in real wages induce workers to get engaged in the manufacturing sector. The coefficient of Log RGVA is positive (0.24). This implies that increase in output shall induce employers to absorb more workers to increase production. The coefficient of Log LI_{-1} is expected to be between zero and one. We have a significant result. This indicates the presence of significant lag in the adjustment of actual employment to its desired level. The coefficient of D_t is negative. This is significant. This means that there is negative impact of liberalization on employment creation in Organised manufacturing sector. Our results are supported by studies made by Basole,A. and Narayan,A. (2020)

Model 4:

The summary statistics of the model provides Goodness of fit, $R^2 = 0.95$, Adjusted R^2: $\overline{R^2} = 0.95$. The number of observations is 38. F-statistic value is 148.98 and is significant at 1% level. The coefficient of Log $(\frac{W}{P})$ is expected to be positive. This implies that increase in real wages induce workers to get engaged in the manufacturing sector. The coefficient of Log RO is positive (0.22). This implies that increase in output shall induce employers to absorb more workers to increase production. The coefficient of Log LI_{-1} is expected to be between zero and one. We have a significant result. This indicates the presence of significant lag in the adjustment of actual employment to its desired level. The coefficient of D_t is negative. This is significant. This means that there is negative impact of liberalization on employment creation in Organised manufacturing sector. Our results are supported by studies made by Basole,A. and Narayan,A. (2020)

Stationatity has been checked for all the variables. There is a minute but positive and significant increase in RGVA due to capital, TFPG and T. With per unit increase in Capital, TFPG and CU there will be an increase in Growth of Real Value Added by the amount of the coefficients obtained. Capacity Utilisation is negative but significant with respect to growth of employment. With an increase in capacity utilization, there will be reduction in growth of real value added. Our model is a good fit model.

Results state that technology over time has positive and significant impact on growth of employment. Growth of Real GVA and employment of the lagged period has a negative impact on growth of employment which is significant. This means with increase in the number of people employed in the previous period and growth in output, there will be a fall in employment growth.

7. SUMMARY AND CONCLUSION

We have made an extensive work on Output measured in terms of Real Gross Value Added (RGVA) and Real Output (RO) of Organised Manufacturing Industries in India. Research has been conducted on employment too. The variables used are Total Persons Engaged (TPE) and Labour Index (LI). The period of study is 1980-81 to 2018-19 for All India. We perform State level analysis for the period 1998-99 to 2018-19. The States considered in research work are selected at decreasing order of percentage share contribution to All India in terms of output and employment. We analyze the pattern of output and employment by studying five types of growth rates. They are namely, Annual Growth rate, Decadal Growth rate, Average Annual Growth rate (AAGR), Compound Annual Growth rate (CAGR) and Trend Growth rate (TGR). We infer that both Output and Employment have grown overtime with respect to all the growth rates. We have compared the growth rate in pre-liberalization and post-liberalization period for All India. We have compared the growth rates in pre-global financial crisis and post-global financial crisis for All India as well as across States. We identify the years of exogenous and endogenous structural breaks over the period of study. The same is done for each of the individual states. Frequency distribution table has been built. It helps years of high growth rate and the number of states experiencing high moderate and low growth rates in terms of output and employment. We estimate the fluctuations in the growth path in All India and for individual states in exogenous and endogenous form over the period of study. We observe for convergence (absolute sigma and absolute beta convergence) across States in India. States with low initial per capita output and employment are supposed to grow faster compared to the states with high initial per capita output and employment (Beta convergence). This induces reduction of disparity in per capita income and employment across time (Sigma convergence). Our results show that there is dispersion in both the cases. The obtained results imply divergence. Stochastic convergence is observed for, by performing unit root test on growth rate of relative share of per capita output and employment to the average of the States. We use Spearman's Rank Correlation Coefficient as a test of accuracy of estimate between the output (RGVA and RO) and employment (TPE and LI). We have an estimate close to 1. This implies that the units of measurement of Output do not have any special significance of their own. Both give similar results. We estimate Output Elasticity of Employment as a ratio of Percentage change in Employment to Percentage change in output. India as a whole experience Jobless growth. We make a frequency distribution table for each year and infer that there are very few states experiencing Job creating growth compared to those experiencing job-less growth. We estimate an output growth function. It is a semi-logarithmic equation. Growth of output depends on the amount of capital used, Total factor productivity growth, capacity utilization. We include a time dummy to check for the pre and post effects of New Economic Policy and Global Financial Crisis. This is done for individual states as well as in aggregate form. Total Factor Productivity Growth is calculated using translog production function including certain trade related variables. Capacity Utilization is a short run concept of the cost function. Our research ends with estimation of the employment growth function. It is

logarithmic equation. It includes real wage, lagged value of employment, output and time dummy. There is extensive research still required in our field of study.

Policy Prescriptions: Labour Laws, Fiscal performance of an economy and Intensity of factor inputs do have an important role to play in enhancing the growth of both output and employment. Government must put forward economic measures for the acceleration of economic variables that improve these variables.

Future Research Opportunities: Analysis across other individual Indian States can be further performed as it would help the policy makers to infer about the potential of organized manufacturing sector in them. Investments can be done on these state based on it, to increase efficiency. Other variables such as firm size also play an important role in growth of output and employment. Unorganized manufacturing sector contribute a much larger proportion in India, thus, it calls for extensive research.

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