Research Paper
Impact Factor: 3.029
Peer Reviewed & Indexed Journal

IJMSRR
E- ISSN - 2349-6746
ISSN -2349-6738

ECONOMIC REFORMS AND DETERMINANTS OF EMPLOYMENT IN SELECTED ORGANISED MANUFACTURING LABOUR INTENSIVE AND CAPITAL INTENSIVE INDUSTRIES IN INDIA- A COMPARATIVE PANEL DATA ANALYSIS.

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Abstract
As far as Indian economy is concerned organised manufacturing sector plays a predominate role in providing employment opportunities to both skilled and semi skilled workers. In this direction the present study examines the determinants of employment in selected organised manufacturing industries classifying them into labour intensive and capital intensive industries. The study makes use of twenty one years (1991-2011) of panel data, comprising of 4-digit twenty organized manufacturing industries. Ten industries from labour intensive segment (LII) and ten industries from capital intensive segment (CII) were selected. The study employed panel estimation models along with IPS panel unit root test. According to Hausman test results, fixed effect model was feasible to LII and random effect model for CII. The employment determinant of labour productivity co-efficient is negative and statistically significant in both industries which implies that not only capital intensive industries are main cause for jobless growth but also the labour intensive industries. The determinant of lag real wage rate is negative and insignificant implying that real wage rate does not affect employment. The co-efficient of real fixed capital is positive and significant in LII whereas it is negative in CII indicating that increasing the amount of real fixed capital reduces employment level. The massive rationalization, adoption of capital intensive techniques in production process and downsizing during economic reforms period are the main causes for unfavorable employment situation. Other determinants like real gross value of output and number of factories are positive and significantly influence employment in both types of industries.

Keywords: Employment, Manufacturing, Panel Data Models.

1.1. Introduction

The close association between industrialization and growth in real income per head, and between the growth of industry and the growth of output as a whole is undisputed. The maxim, "manufacturing as the engine of growth"[1]Signifies the importance of the sector. The strong association between growth of industry and the growth of the economy as a whole has been confirmed by many studies.[2] This implies that greater the manufacturing output higher is the growth rate. This conclusion is drawn from the following two reasons. First, productivity growth and industry growth are closely associated and; this relationship is established and reinforced by the presence of static and dynamic gains from the scale economies which are the characteristic feature of the manufacturing industry. Static gains refer to size and scale of production units. "In the process of doubling the linear dimensions of equipment, the surface increases by the square and the volume by the cube."[3] Induced technical progress, learning by doing and the external economies in production bring about dynamic economies in the manufacturing industry. Manufacturing industry is the sector wherein major costs saving technical changes take place. The relationship between the productivity growth and the industry growth is sometimes referred to in the literature as Verdoorn's law'.[4] Secondly, faster the growth of manufacturing industry faster is the rate of transfer of labour force from non-manufacturing sector which is characterized either by diminishing returns or where employment growth and output growth has no positive correlation because of existence of large amounts of surplus labour. The transfer of this surplus labour from agriculture raises productivity growth in manufacturing sector.[5]

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[1] *For measurement of economic development, see A.P. Thirlwall, Growth and Development, with special reference to Developing Economies (ELBS) 1983, p.55.*
[2] *See for example, Symposium on Kaldor's growth laws, edited by A.P.Thirlwall in Journal of Post-Keynesian Economies, spring 1983.*
[3] *Thirlwall, op.cit.p.56.*
[4] *'Verdoorn's law' refers to the hypothesis that once a region obtains a growth advantage it will tend to sustain it at the expense of other regions because "faster growth leads to faster productivity growth." Geographic dualism (Such as cumulative causation hypothesis advanced by Gunnar Myrdal, 1975) is the outcome of such a relationship.*
[5] *See growth models of surplus labour advanced by Arthur lewis (1954), Rodan (1943), Nurke (1953) and Ranis and Fei(1961)*

The relationship between growth and industrialization is thus two ways: higher rates of growth foster faster industrialization ensuring higher growth rates via productivity growth. The New Economic Policy (NEP) was announced in July 1991. It consisted of wide range of economic reforms. The main thrust of the policy was to create a more competitive environment in the economy and removing the barriers to entry and growth of new firms. The NEP programme can be classified into two groups. They are stabilization programmes and structural adjustment programmes; former are short term measures concerning the aggregate demand of the economy, whereas later thrived for structural and productivity changes in the economy. These are micro economic measures which affect concerned sectors only. They intend to improve the efficiency of the economy and increase its international competitiveness by removing restrictions in various sectors of the economy in general and manufacturing sector in particular.

Expansion and creation of employment opportunities has been the unstated objective of economic reforms being followed since the early 1990s in India. As industrial controls and trade restrictions are lifted, it is argued that this would result in higher output growth leading to creation of new employment opportunities and a visible fall in poverty and inequality. But the emerging evidence in India since the 1990s on the employment front has been rather dismal. The concern arising out of sharp deceleration, particularly in rural employment, has been well documented by now. The constitution of several committees within a span of four-five years on employment by the Indian government is itself a proof of the concern arising out of declining employment growth in the post-reform period.[6]

The need to ensure adequate growth in employment opportunities to provide productive employment for the continuing increase in the labour force is one of the most important problems being faced by the country. There is a widespread concern that the acceleration in GDP growth in the post-reform period has not been accompanied by a commensurate expansion in employment. Public sector employment is expected to fall as the public sector withdraws from many areas. There are fears that the processes of internal liberalization and globalization, inevitable though they may be, are creating an environment which is not conducive to expanding employment in the organised private sector. Existing industrial units are shedding excess labour in order to remain competitive and adopt new technology, which is typically more automated and therefore not job creating. The net result of these forces, it is feared, could be a very slow expansion in employment opportunities in the organised sector, with a rise in unemployment rates and growing frustration among the youth. The problem is perceived to be especially severe for educated youth, who have high expectations about the quality of employment opportunities that should come their way.[7]

Theoretically it is shown that the productivity might have increased by adopting new technology in production process which has resulted in rapid increase in economic growth in India along with reforms. The growth might be creating employment in the sectors where labour has suitable skill warranted by new changing environment and not in the other sectors. In this context, the present study tried to examine comparative employment determinants of selected organised manufacturing industries in India.

1.2. Literature Review

Bishwanth Goldar (2000) in his study titled "Growth in Organised Manufacturing Employment in Recent Years" revealed that employment in India's organised manufacturing sector has increased in recent years at the very rapid rate of 7.5% per annum between 2003-04 and 2008-09. The impression of jobless industrial growth prevailing for some time is therefore not valid any more in some states. Interstate differences in the rate of growth in organised manufacturing employment show a pattern which suggests that job creation in organised manufacturing in different Indian states may be positively related to the extent of labour reforms undertaken. Using labour reform index, the study classified Indian states into two categories - top five and bottom five states; the top five states in terms of the labour reform index combinedly achieved 7.5% per annum growth rate of employment in the organised manufacturing sector. The bottom five states in terms of the labour reform index, recorded 3.7% growth rate in employment per annum. The study implies that labour reforms undertaken by the states had a favorable impact on growth of industrial employment.

Choudhuri (2002), studied the changes in labour intensity in the organized manufacturing sector 3-digit groups for 1990-91 and 1997-98. He found that labour intensity had progressively gone down from 0.78 in 1990-91 to 0.56 in 1997-98.**Dipankor Coondoo, et al., (1993),** in their paper titled "Technology Intensive Industriliasation in LDCs: Experience of Indian Industries," show that the growth and composition of industries have been fast changing in the LDCs mainly through foreign collaborations during the last few decades. But they wanted to examined does this tendency of technology import generate

[6] *Planning Commission (2001)*
[7] *Report of Task Force and Employment opportunities (Planning Commission, 2001,para 1.1)*

efficient utilisation of inputs when the process is becoming more capital deepening as reflected in rising capital coefficients? Their study revealed some interesting phenomena regarding the performance of Indian manufacturing industries over the period 1974-75 to 1985-86. First, the growth of output in individual industries and their corresponding changes in capital coefficients have been studied. Second, a decomposition analysis has been done to find out the factors responsible for the rise in capital-output ratio. Finally, the question of efficiency is examined from the relationship between capital-labour ratios and labour productivities by a comparative static analysis over different time spans. Their study shows that while output 'grows at a very moderate rate, capital coefficients, on the other hand, rise at remarkably high rates. But this increasing capital coefficient fails to produce higher labour productivities across industries.

Goldar (2004), by including the period 1997-98 to 2002-03 in the analysis, found some contrasting results. He found that employment in organized manufacturing during 1990-91 to 2002-03 grew at a rate of 0.5% per annum whereas employment in organize manufacturing between 1997-98 to 2002-03 was negative at 2.6% per annum.

Kannan K.P, Raveendran G (2009) in their paper "Growth Sans Employment: A Quarter Centenary of Jobless Growth in India's Organized Manufacturing" discussed employment growth for 1981-82 to 2004-05. For the period as a whole, as well as for two separate periods of pre and post reform phases the picture that emerges is one of " jobless growth" due to the combined effect of two trends that have cancelled each other. One set of industries was characterized by employment creating growth while another set by employment displacing growth. Over this period, there has been acceleration in capital intensification at the expense of creating employment. A good part of the resultant increase in labour productivity was retained by the employers, as the product wage did not increase in proportion to output growth. The workers as a class thus lost in terms of both additional employment and real wage in organised manufacturing sector.

Nagaraj .R (1994) in his study "Organised Manufacturing Employment Contrary to the Jobless Growth in 1980" showed that employment in registered manufacturing industries grew annually at about 3% during 1991-97.

Pulapre Balakrishnan, et al., (2004) in their paper titled "Growth and Distribution in Indian Industry in the Nineties, they found that there is a faster rate of output across manufacturing since 1991, but then this is by no means dramatic, there is also a rise in employment, though perhaps not commensurate with the increase in the rate of growth of output. However principal among the proximate causes of output growth in the nineties has been investment with the share of investment in output having increased very substantially overall and pretty much across the board in Indian manufacturing. The share of investment reflects response to a regime change, the rise in its share signals the success of reforms in energizing the supply side of the economy. However, the quite significant rise in investment does not represent animal spirits alone.

Nagaraj.R (2014) in his study titled " Fall in Organised Manufacturing Employment: A Brief Note" revealed that about 15% of workforce in the organised manufacturing sector lost their jobs between 1995-96 and 2000-01, which comes to 1.1 million workers. These losses have been widespread across major states and industry groups. Real wages have practically stagnated, when per capita income grew close to 3% per year during the 1990s. According to him setting up of the national renewal fund as a component of structural adjustment programme in 1991 to finance Voluntary Retirement Scheme in public sector enterprises seems to have provided the initial impetus. Taking cues from it, private sector retrenched and laid off workers with relaxed as enforcement of labour laws. Shedding of excess labour was perhaps one of the initiatives of industrial restructuring in the face of increased domestic and external competition under changed policy regime.

Nagaraj.R (1994) in his paper titled **"**Employment and Wages in Manufacturing Industries, Trends, Hypothesis and Evidence" examined the trends in wages and power of organised labour. His study found that a sharp rise in the wage rate in the eighties in registered manufacturing sector due to increasing policy induced distortions in the labour market led firms to substitute capital for labour, resulting in the observed decline in employment; increasing competition in the product market due to domestic liberalization and increase in the cost of borrowed funds accounted for the decline in employment in registered manufacturing in the eighties.

Sanja.S. Pattnayak, et al., (2003), in their paper studied the effects of the key economic reforms of 1991 on the Indian manufacturing industries using panel data of manufacturing industries. They used a translog cost function to analyze the production structure in terms of technical change and economies of scale. A panel consisting of 121 Indian manufacturing industries from 1982 to 1998 was used in their estimation. They found the result that there are economies of scale (only moderate) in the Indian manufacturing industries and it has been exploited after the key economic reforms in 1991. Their study also revealed that there is a bias technology change and majority of the industries have experienced capital-using technical change.

1.3. Research gap

The evidence of already existing studies revealed that after liberalization of the economy, the growth of the overall employment in the manufacturing sector has declined. However, not all sectors experienced a decline in employment during the period of the policy change. The objective of this study is to examine the determinants of employment in selected labour intensive and capital intensive organised manufacturing industries in India during economic reform period.

The factors determining the performance of employment in organised manufacturing industries has been severally tested; but not by classifying them into labour intensive and capital intensive. Also, some of the variables not incorporated are used. The study made an attempt to focus 4digit Indian organised manufacturing industries and has considered relatively longer period of data.

1.4. Data and Methodology

The study is based on panel data of Annual Survey of Industries (ASI), collected from Centre for Monitoring Indian Economy (CMIE), Industry Outlook, Central Statistical Organization (CSO), Ministry of Statistics and Program Implementation, GOI, New Delhi and Index number collected from Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, for the period of 22 years from 1990 to 2011. The variables used for the study are as follows: nominal gross value of output was converted to real one by deflating the annual current value by wholesale price index (WPI) of manufacturing product (Base 2004-05=100). WPI for all manufactured product has been used as a proxy. The number of workers is considered as Employment variable; real fixed capital was deflated by price index of machinery and machine tool products (base 2004-05=100) using machine and machine tool product index as a proxy and; for converting nominal wages to worker into real wages to worker, annual value has been deflated by consumer price index of industrial worker (CPIIW) (base 2001=100). General CPIIW was considered as a proxy. Labour productivity as the ratio of real gross value of output to number of workers and real wage per worker was calculated as the ratio of real wages to worker to number of workers.

The study examined the determinants of employment in selected organised manufacturing labour intensive and capital intensive industries based on a labour demand equation derived from production function where employment is a function of labour productivity, lag of real wage, real gross value of output, real fixed capital and number of factories.

EMP=F (LP, RWt-1, RGVO, RFC.FAC)

Where,

EMP= Number of workers

RWt-1= Lag of real wage

RGVO= Real gross value of output

RFC= Real fixed capital

FAC= Number of factories.

The study used panel estimation models - the fixed effects model and the random effects models to identify the determinants of employment in organised manufacturing selected labour intensive and capital intensive industries in India. The fixed effects model takes into account the firm specific effects where as the random effects model considers the time effect.

The fixed effects model is expressed as:

$E_{it} = \alpha_i + X_{it}\beta + u_{it}$ where i = 1,...,N; t = 1,..., T; E_{it} is employment variable of i^{th} industry in the t^{th} period, X_{it} is vector of K explanatory variables of i^{th} industry in t^{th} period, β is parameters to be estimated and u_{it} is error term assumed ~ $N(0, \sigma^2)$ α_i, 1,2,3,4,……..N are constant co-efficients, specific to each industry. Fixed effect model assumes that differences across the considered industry appear by means of differences in the intercept term. These individual co-efficients are estimated together with vector of parameters β.

The random effects model is defined as:

$E_{it} = \alpha_i + X_{it}\beta + u_{it}$ where i = 1... N; t = 1,... ,T.

In the random effects model, the α_i's are treated as random variables rather than fixed constants. The α_i's are assumed to be independent of the errors u_{it}, i.e., α_i ~ N is a zero mean, random disturbance with variance $\sum U^2$. The E_{it} ,α_i, X_{it} are defined as employment of i^{th} industry in t^{th} period and vector of K explanatory variables of i^{th} industry in t^{th} period respectively. Since α_i's are random, the errors now are $W_{it}= \alpha_i+U_{it}$. (The composite error term consists of two components, α_i, which is the cross-section, or individual-specific error component, and U_{it}, which is the combined time series and cross-section error component. The term error components model derives its name because of the composite error term W_{it} which consists of two or more error components). The presence of α_i produces a correlation among the errors of the same cross section unit,

though the errors from different cross-section units are independent. In random effect (error component) models when the variance of the individual specific effect and error term are unknown, generalized least squares method (GLS) is the standard way for estimation of parameters (Baltagi, 2005).

Finally, to select an appropriate model from fixed effects and random effects model, the study employed Hausman test. The hypotheses are specified as follows:
H_o: Industry specific effects are uncorrelated with the regressors
H_1: Industry specific effects are correlated with the regressors
The null hypotheses H_o indicate that the estimations of the fixed effects panel model are not statistically different from the estimate of the panel model with random effects. If H_o is rejected, the fixed effects model will be appropriate. Failure to reject the H_o implies that the random effects model will be preferred.

1.5. Industry identification classification criteria and industries selected for analysis
In this paper, the National Industrial Classification (NIC2004) at a disaggregate 4- digit level is used in order to assess the Labour Intensity and Capital Intensity of the Organised Manufacturing Sector.[8] The time period chosen for the study is from 1990 to 2011.The 4- digit industries are spread across the 23, 2-digit divisions 15 to 37 (see appendix 1 for details). These 23 divisions constitute the entire manufacturing sector of India. All the 141 4-digit industries at the NIC 2004 classification in the organized manufacturing sector were considered. However to build a continuous time series at NIC 2004, some 4-digit industries had to be merged as well as deleted. These 4-digit industries belong to the organized manufacturing sector, as documented in the Annual Survey of Industries (Central Statistical Organization, Government of India).

For examining productivity performance growth in Indian Organised Manufacturing Industries, industries were classified as Labour Intensive and Capital Intensive industries. For identifying Labour Intensive and Capital Intensive Industries, the labour-Capital ratio (L/K) ratio for all industries for every year, and for each industry an average (L/K) ratio was calculated for the period 1990 to 2011. The average (L/K) ratio for all industries taken together was found to be 5.40. All the industries with average (L/K) ratio greater than 5.40 were considered as Labour Intensive Industries and all those Industries with a ratio less than 5.40 were labelled Capital Intensive Industries. Ten industries from Labour Intensive Segment and ten industries from Capital Intensive Segment were selected. The share of total value added and export contributions were considered for selecting industries with competitive ability.

1.6. Industries Selected for Analysis
On the basis of above procedure the following industries have been selected for analysis. Names of Selected Organised Manufacturing Labour Intensive Industries and Capital Intensive Industries are given in the Table1 National Industrial Classification (NIC-2004) was used for industry code.

Table 1 Selected Organised Labour Intensive and Capital Intensive manufacturing Industries in India.

Selected 4-digit Organised Labour Intensive Manufacturing Industries NIC-2004			Selected 4-digit Organised Capital Intensive Manufacturing Industries NIC-2004		
Sl No	**Industry Code NIC 2004**	**Name of The Industry**	**Sl No.**	**Industry Code NIC 2004**	**Name of The Industry**
1	1730	Knitted and Crocheted Fabrics	1	2511	Rubber Tyres and Tubes; Retreading and Rebuilding of Rubber Tyres
2	1723	Cordage, Rope, Twine and Netting	2	2320	Refined Petroleum Products
3	1810	Wearing Apparel, Except Fur Apparel	3	2710	Basic Iron and Steel
4	1729	Other Textiles N.e.c.	4	2720	Basic Precious and Other Non-ferrous Metals
5	1912	Luggage, Handbags and the	5	2411	Basic Chemicals

[8] Organised manufacturing industries comprise those industrial units which are registered as 'factories', i.e., they employ 10 or more workers with power or 20 or more workers without power.

		Like, Saddlery &Harness			
6	1920	Footwear	6	3530	Air and Spacecraft and Related Machinery
7	3610	Furniture	7	3591	Motorcycles
8	2811	Structural Metal Products	8	2926	Agricultural and Forestry Machinery
9	3691	Jewellery and Related Articles	9	2921	Machinery For Textile, Apparel and Leather Production
10	3592	Bicycles and Invalid Carriages	10	3110+3120	Electric Motors, Generators, Transformers and Electricity Distribution and Control Apparatus

Source: National Industrial Classification 2004, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India.

1.7. Empirical Result and Discussion

As panel time series data was used, the unit root test has been applied to ascertain the stationary of the data series. A variety of procedures existed for the analysis of unit roots in a panel context. Present study made use of IPS test developed by Im, Pesaran and Shin (2003). IPS test using the likelihood framework, suggested a new more flexible and computationally simple unit root testing procedure for panel which shows in terms of t-bar statistic that allows for simultaneous stationary and non-stationary series (Barbieri, Laura 2006). The IPS panel unit root test is based on averaging individual Dickey-Fuller unit root tests computed for each cross-section unit in the panel when the error term U_{it} of the model is serially correlated, possibly with different serial correlation patterns across cross-sectional units when T and N are sufficiently large. In IPS panel unit root test null hypothesis (Ho) is that of a unit root or individual unit root process which means variables are in nonstationary process, alternative hypothesis(Ha) is variables are in stationary process. Failing to reject the null hypothesis (Ho) implies that the variables are non stationary. The IPS panel unit root test results presented in table 2 for labour intensive industries and table.3 for capital intensive industries show that in both types except lag real wage rate variable all the other variables are non stationary, and they are stationary at their first difference level (taking successive differences of the variables with loss of one observation).

Table: 2. Results of Panel unit root test (Im, Peasaran and Shin) for selected Labour Intensive Industries

Variables	**Level**		**First Differences**	
	Statistic	**Probability**	**Statistic**	**Probability**
LAB	6.57992	1.0000**	-4.86197	0.0000*
LP	0.61787	0.7317**	-13.4399	0.0000*
RW_{t-1}	-4.38636	0.0000*		
RGVO	7.79631	1.0000**	-9.17643	0.0000*
RFC	9.26798	1.0000**	-7.34795	0.0000*
FAC	7.99699	1.0000**	-7.49057	0.0000*

*Significant at 1%, **Insignificant

Null Hypothesis: Unit root (Individual unit root process)

Table: 3.Panel unit root test of selected Capital Intensive Industries. Result of Panel unit root test (Im, Peasaran and Shin)

Variables	**Level**		**First Differences**	
	Statistic	**Probability**	**Statistic**	**Probability**
LAB	0.87018	0.8079**	-10.5866	0.0000*
LP	3.65005	0.9999**	-9.64814	0.0000*
RW_{t-1}	-22.0668	0.0000*		
RGVO	8.82489	1.0000**	-7.65555	0.0000*
RFC	9.54723	1.0000**	-7.30699	0.0000*
FAC	2.44401	0.9927**	-11.8341	0.0000*

*Significant at 1%, **Insignificant

Null Hypothesis: Unit root (Individual unit root process)

Table: 4. Correlated Random Effects-Hausman Test for Labour Intensive Industries

Test Summary	Chi-Sq.Statistic	Chi-Sq.d.f.	p-value
Cross-section random	32.352617	5	0.0000*

*Significant

Table: 5. Estimation Results of Panel Models Labour Intensive Industries

Dependent variable: Employment.								
Fixed Effects (GLS) Regression					**Random Effects (GLS) Regression**			
Variable	**Co-efficient**	**Std.Error**	**t-Statistic**	**p-Value**	**Co-efficient**	**Std.Error**	**t-Statistic**	**p-Value**
C	2530.830	1920.820	1.317578	0.1892	7628.936	2563647	2.971178	0.0033
LP	-10615.41	1498.131	-7.085772	0.0000*	-22278.28	2723.065	-8.181323	0.0000*
RW_{t-1}	-3773.183	47055.59	-0.080186	0.9362***	-12331.5	61168.30	-2.016036	0.0451**
RGVO	0.127126	0.018948	6.709338	0.0000*	0.265967	0.033261	7.996478	0.0000*
RFC	0.483844	0.081521	5.935227	0.0000*	0.423328	0.086439	4.897404	0.0000*
FAC	16.98076	3.360426	5.053158	0.0000*	7.752519	3.399861	2.280246	0.0236*
Weighted Statistics					**Weighted Statistics**			
R-Squared	0.548438				0.501669			
Adjusted R-Squared	0.516018				0.489455			
Durbin-Watson Statistic	2.207459				1.740474			
F-Statistics	16.91672				41.07323			
Prob (F-Statistic)	0.000000				0.000000			

Note:*Significant at 1%level, **Significant at 5%level, ***Insignificant

On the basis of unit root test results, the parameters were estimated in both fixed effect and random effects model. The appropriate model was selected using Hausman test. Hausman test statistic mentioned in table 4, where Chi-square statistic value (32.352617) and p-value (0.0000) shows that the null hypothesis is rejected, which indicates that industry specific effects are correlated with the regressors. So, this suggested that fixed effects model was appropriate for selected labour intensive industries in India. In the table 4, though the estimated results of both types of models are given the interpretation is focused on fixed effects model only.

Table 5 represents results of selected ten four digit labour intensive organised manufacturing industries, where the relationship between employment and its determinants over the period 1990-2011 were estimated. Both the models are reported side by side, fixed effects model is analysed. Co-efficient of labour productivity (LP) -10615.41 is statistically significant impling that an increase in labour productivity will reduce the employment level in selected organised manufacturing labour intensive industries in India. Co-efficient of lag real wage (RW_{t-1}) -3773.183 represents that an increasing lag real wage rate negatively influences employment but statistically is insignificant. Co-efficient of real gross value of output (RGVO) is positive and statistically significant representing that real gross value of output proportionately influences employment; an increase in real gross value of output will increase the employment in labour intensive segment. Other determinants real fixed capital (RFC) and number of factories (FAC) co-efficient values are positive and statistically significant which implies that both positively influence employment.

R-Square value 0.548438 represent 54% of variation in dependent variable employment is explained by independent variables labour productivity, lag real wage, real gross value of output, real fixed capital and number of factories.

Table: 6. Correlated Random Effects-Hausman Test for Capital Intensive Industries

Test Summary	Chi-Sq.Statistic	Chi-Sq.d.f.	p-value
Cross-section random	3.699715	5	0.5934**

****Insignificant**

Table: 7.Capital Intensive Industries Estimation Results of panel Models

Dependent variable: Employment.								
Fixed Effects (GLS) Regression					**Random Effects (GLS) Regression**			
Variable	**Co-efficient**	**Std.Error**	**t-Statistic**	**p-Value**	**Co-efficient**	**Std.Error**	**t-Statistic**	**p-Value**
C	-938.6944	1199.891	-0.782316	0.4350***	951.9331	2252.731	0.422568	0.6731***
LP	-1296.100	224.6754	-5.768768	0.0000*	-1649.299	312.5503	-5.276906	0.0000*
RW_{t-1}	451.5522	11705.00	0.038578	0.9693***	-15511.67	22501.54	-0.689360	0.4914***
RGVO	0.053994	0.008623	6.261338	0.0000*	0.053761	0.009894	5.433959	0.0000*
RFC	-0.010568	0.012997	-0.813076	0.4172***	-0.020970	0.012208	-1.717704	0.0874**
FAC	31.85192	3.312018	9.617074	0.0000*	35.65333	5.704356	6.250193	0.0000*
Weighted Statistics					**Weighted Statistics**			
R-Squared		0.518221			0.345138			
Adjusted R-Squared		0.483632			0.329087			
Durbin-Watson Statistic		2.548272			2.739979			
F-Statistics		14.98216			21.50319			
Prob (F-Statistic)		0.000000			0.000000			

Note:*Significant at 1%level, **Significant at 10%level, ***Insignificant.

The results in table 6 of the Hausman test statistic (3.699715) and its p-value (0.5934) suggest that random effect model is appropriate for selected capital intensive industries; failing to reject null hypothesis means industry specific effects are uncorrelated with the regressors. The interpretation is focused on estimated random effect model reported in table7. Co-efficient value of labour productivity -1649.299 represent that an increase in labour productivity in selected capital intensive industries in India leads to reduced employment. Co-efficient of real wage rate -15511.67 indicates that it negatively influence employment but is statistically insignificant represent. The co-efficient of real gross value of output and number of factories are 0.053761 and 35.65333 respectively and both are statistically significant; impling that growth in these variable is accompanied with growth in employment. Co-efficient of real fixed capital -0.020970 represents that real fixed capital negatively influences employment in selected organised manufacturing capital intensive industries in India.

1.8. Conclusion

The paper examines the determinants of employment in selected labour intensive and capital intensive industries in India. In Indian context most of the organised manufacturing industries studies focused on manufacturing sector as a whole and few cross industry studies with a small sample of industries existed. Present study fills the gap by classifying selected organized manufacturing industries into labour intensive and capital intensive industries. It examined the determinants of employment using a panel of twenty organised manufacturing industries over a 21 year period. The functional form of the employment is based on production function, in which labour productivity, lag real wage rate, real gross value of output, real fixed capital and number of factories variables are incorporated as determinants of employment. To address the issue of unit root or non stationary problem faced in panel time series data, IPS panel unit root test was employed. Hausman test statistic was used for selecting appropriate model for empirical estimation. The test suggests that fixed effect model was appropriate for selected labour intensive industries and random effect model for selected capital intensive industries in India.

Numerous studies have shown that economic reforms have negatively influenced employment and present study results also confirm the same. One of the important finding of this study is that the co-efficient of labour productivity in both labour intensive industries and capital intensive industries has been negative and statistically significant, indicating that employment has reduced not only in capital intensive industries but also in labour intensive industries. Labour productivity growth in selected organised manufacturing industries implies that fewer workers are needed to produce a given level of output; unless demand for organised manufacturing output rises quicker for organised manufacturing labour intensive industries than other sectors, a rapid labour productivity growth will imply a decrease in the share of employment in selected labour intensive industries in India. The co-efficient of lag real wage rate was negative but statistically insignificant. This may be due to the fact that economic reforms provide more opportunity to technically skilled and trained people in India. However, the result of real wage rate associated with employment in labour intensive industries is not surprising because India is a labour surplus economy and for any given wages in an industry, there is unlimited supply of labour and under utilization of capacity due to inadequate effective demand. With respect to other determinants such as real gross value of output and number of factories,

they have positive and significant influence on employment in both labour as well as capital intensive organised industries indicating that real gross value of output and numbers of factories have favourable influence on employment generation.

Regarding association of real fixed capital with employment, real fixed capital is positive and significant with respect to labour intensive industries where as it's negative and statistically significant at 10% level. This implies that an increase in real fixed capital leads to reduction in the employment level in selected organised manufacturing capital intensive industries in India. This may be due to massive rationalization, adoption of capital intensive techniques in production process and downsizing in the economic reforms period leading to rapid growth of real fixed capital especially in capital intensive industries. The same is not true with labour intensive industries where influence of real fixed capital turned to out be positive and significant. Thus, it can be concluded that real gross value of output and number of factories play an important role for generation of employment whereas other determinants such as labour productivity, lagged real wage rate and real fixed capital show that not only capital intensive industries are the main cause for reducing employment in the era economic reform but also labour intensive industries too negatively influence employment, which means that economic reforms created a negative impact on employment. This can be of drastic impact to the economy witnessing huge additions to labour force.

The steps taken to resolve the problem of unemployment have been largely in financial terms. Infact, central assistance should be linked with specific programmes for the development of the relatively labour intensive industries. Separate industries development programme for labour intensive industries that should enhance efficiency and competitive ability of labour intensive industries through effective implementation of skill oriented programme, technical up gradation programme and quality of product manufacturing. It must also be ensured that the labour force suit the needs of industries so as to fulfill the changing global economic environment requirements and also at the same time create better economic opportunity to absorb surplus labour force existing in the economy. For a country with greatest demographic advantage, it's high time to have a coordinated Human Resource Development Policy, Labour Policy and Industrial Policy so that the ever increasing labour forces find enough employable opportunities.

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Appendix 1: National Industrial Classification (NIC 2004) Code for Manufacturing in India.

Industry Division	Name of the Industry
15	Manufacture of Food and Beverages
16	Manufacture of Tobacco Products
17	Manufacture of Textiles
18	Manufacture of Wearing Apparel
19	Tanning and Dressing of Leather
20	Manufacture of Wood and Wood Products
21	Manufacture of Paper and Paper Products
22	Publishing, Printing, and Reproduction of Recorded Media
23	Manufacture of Coke, Refined Petroleum etc
24	Manufacture of Chemical and Chemicals products
25	Manufacture of Rubber and Plastics
26	Manufacture of Other Non-Metallic Products
27	Manufacture of Basic Metals
28	Manufacture of Fabricated Metal Products
29	Manufacture of Machinery and Equipment
30	Manufacture of Office, Accounting, and Computer Machinery
31	Manufacture of Electrical Machinery
32	Manufacture of Radio and Television
33	Manufacture of Medical, Precision etc
34	Manufacture of Motor Vehicles, Trailers, and Semi-trailers
35	Manufacture of Other Transport Equipment
36	Manufacture of Furniture, Manufacturing n.e.c
37	Recycling

Source: National Industrial Classification 2004, Central Statistical Organisation, Ministry of Statistics and Programme Implementation, Government of India.