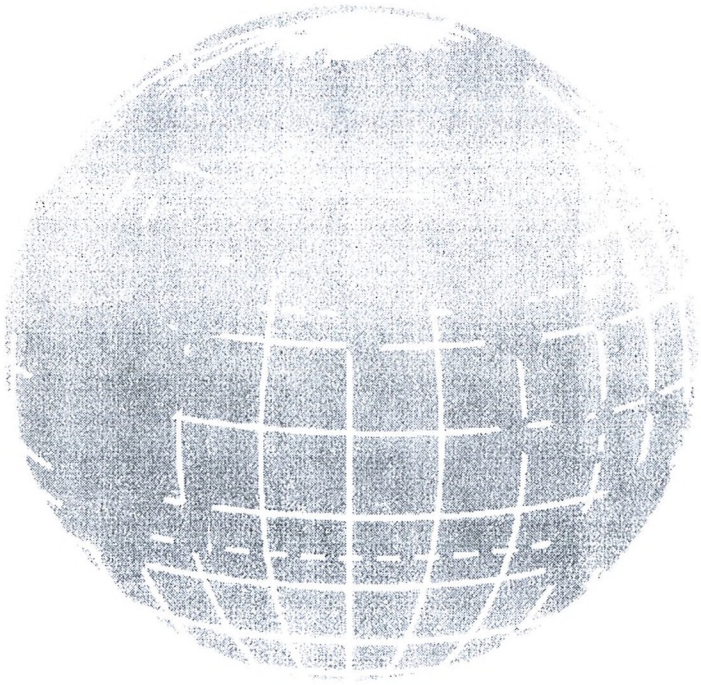
THE ASIAN ECONOMIC REVIEW

JOURNAL OF THE INDIAN INSTITUTE OF ECONOMICS

Vol. 54 April 2012 No. 1



THE INDIAN INSTITUTE OF ECONOMICS

FEDERATION HOUSE, 11-6-841, Red Hills, Hyderabad - 500 004.

ANALYSIS OF PRODUCTIVITY IN INDIAN INDUSTRIES

M.MANONMANI*

ABSTRACT

An attempt has been made to analyse determinants of productivity based on the indices of partial and total factor productivity in rural, urban and aggregate industries of India for the reference period between 1998-99 and 2007-08. Multiple linear regression model was applied to analyse the data. To find out the average annual growth rate in partial as well as total factor productivity , exponential growth function was applied. It was found that the trend rates of partial and total factor productivity indices were positive.The analysis also revealed an inverse relationship between labour productivity and unit- labour cost in these industries. Significant relationship existed between all forms of productivity indices and the major factors which influence productivity. It was concluded that the productivity of capital and total factor productivity may be taken into account along with labour productivity while granting wage increase so that wage increase is not of inflationary nature. In order to boost the total factor productivity growth there is a pressing need to harmonise the industrial relations with workers and management In this context, amendments in labour laws,greater participation of workers in management and rehabilitation of workers especially in case of disinvestment of public sector units are some spheres which require quick attention of policy makers to create conducive environment.

Productivity growth has traditionally been regarded as one of the main sources of income growth, along with capital accumulation and the deepening of human capital development. These factors and the historically established positive relationship between productivity, employment and earnings have made productivity improvement and it is now recognized as an important policy lever for economic development. Advocates of liberalization argue that opening up local markets to foreign competition and foreign direct investment will help to improve the productivity of domestic industry, resulting in more efficient allocation of resources and greater overall output.

The reforms initiated in 1990s added impetus to enhance the competition, productivity and efficiency. Productivity is a relationship between real output and input, measures the production process. Increased productivity is related with more output produced with either the same amount of inputs, or with less inputs, or with little increment in inputs. Higher productivity growth is associated with increase in capital intensity, labour productivity and capital productivity. Empirical evidence suggests that productivity

*Associate Professor in Economics, Avinashilingam Institute for Home science And Higher Education for Women Univesity Coimbatore 43.

in turn reduces unit cost, enhance product quality, increase workers wage, and offers returns on investment. Productivity is the prime determinant of acountry's level of competitiveness, higher standard of living and sustained growth in the long run. analysis of productivity to gauge relative performance of individual enterprises a similar interest is discernible in various countries. For maintaining and sustaining a higher level of performance, it is imperative that the productivity process is so geared and organised as to yield an optimum and progressively higher reinvestment in the production of goods and services.

The need for studying productivity growth arises due to the intimate link betweenproductivity growth and economic growth. Economic growth has implications for resource use in general. Productivity growth is the basis of efficient economic growth. Economic growth has been defined as the process of a sustained increase in the production of goods and services with the aim of making available a progressively diversified basket of goods to population. Scarcity of resources, which includes physical, financial and human resources, has been recognised as a limiting factor on the process of economic growth. While output expansion based on increased use of resources is feasible, it is not sustainable. Therefore, efficiency or productivity of resources becomes a critical factor in economic growth. These terms, which will be defined more precisely in the following section, indicate ability to obtain a given amount of good or service by using a lesser amount of input. Productivity growth, therefore, is critical for ensuring sustained increase inthe production of goods and services. Economic growth has traditionally been associated with industrialisation. At least that is what makes the diversity in the basket of consumption goods and services possible, when trading possibilities are limited. But industrialisation in the initial stages has the effect of making resource scarcities more acute, making it all the more necessary that available resources are utilised more productively. Role of productivity growth in the process of economic growth became clear when in the1950's it was found that accumulation of productive factors (capital and labour) could explain only a fraction of actual expansion of output. Productivity growth has traditionally been regarded as one of the main sources of income growth, along with capital accumulation and the deepening of human capital development. These factors and the historically established positive relationship between productivity, employment and earnings have made productivity improvement and it is now recognized as an important policy lever for economic development. Advocates of liberalization argue that opening up local markets to foreign competition and foreign direct investment will help to improve the productivity of domestic industry, resulting in more efficient allocation of resources and greater overall output. With this backround an attempt is made in the first section to over view the trends in partial as well as total factor productivity indices along with annual average growh rates. In the second section the influence of variables in determining the productivity were taken into account and found out the relationship.

Methodology

Net Value Added (NVA) was taken as output. Labour input (L) consisted of both workers directly involved in production and persons other than workers like supervisors, technicians, managers, clerks and similar type of employees. The invested capital (K)was taken into account as capital. Wages included renumeration paid to workers.The basic data source of the study was Annual Survey of Industries (ASI) published by Central Statistical Organisation (CSO), Government of India covering the period from1998-99 to 2007-08.All the referred variables were normalised by applying Gross Domestic Product (GDP) deflator. The GDP at current and constant prices were obtained by referring to Economic Survey, published by Government of India, Ministry of Finance and Economic Division Delhi.

Tools of analysis

a. Partial factor productivity indices

Partial factor productivity measures the ratio of output to one of the inputs setting aside interdependence of use of other output. Labour productivity (NVA/L) is measured as a ratio of value added to total number of persons employed. Capital Productivity (NVA/K) is measured as a ratio of value added to gross fixed capital.

b. Total factor productivity (TFPI)

A broader gauge of productivity, total factor productivity is measured by combining the effects of all the resources used in the production of goods and services (labor, capital, raw material, energy, etc.) and dividing it into the output. Total factor productivity indices were calculated by applying direct method of $\sqrt{}$ **PFPLX PFPK,** Where **PFPL** represents partial factor productivity of labour and **PFPK** represents partial factor productivity of capital.

c.Multiple linear regression model

Taking Total Factor Productivity Index (TFPI), partial factor productivity of labour (NVA/L), partial factor productivity of capital (NVA/K) as dependent variable and LnNVA, LnW, LnK and LnT as independent variables multiple linear regression model was applied to analyse the major determinants of productivity. The model is as follows.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Where Y = Dependent variable

β_0 = Constant co –efficient

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression co-efficients of X1, X2, X3, X4

X1, X2, X3, X4 = Independent variables

d.Exponential growth function:

To find out the average annual growth rate an exponential growth function of the following was applied.

$$Y=abt$$

Where, 'Y' is dependent variable

'a' is constant co-efficient

'b' is parameter

't' is independent variable(time element)

Trends in Partial and Total factor productivity indices:

Table-1 gives details regarding the partial as well as total factor productivity indices of rural industries along with the annual average growth rates.

Table –1: Productivity trends in Rural Industries of India

Year	PFPL	PFPK	TFPI	K/L	W/V
1998-99	100	100	100	100	100
1999-00	115	112	113	102	97
2000-01	117	110	114	106	105
2001-02	119	105	112	114	111
2002-03	139	128	133	109	83
2003-04	162	137	148	118	74
2004-05	186	154	169	121	61
2005-06	216	166	189	130	49
2006-07	266	188	224	142	37
2007-08	307	186	239	166	34
$\overline{x}$	173	139	154	120	75
R^2	.959	.934	.957	.888	.868
β_1	13.25*	7.86*	10.52*	2.10*	-5.80*
$t\ \beta_1$	13.702	10.674	13.284	7.957	-7.266

Source: Calculations are based on ASI data

Foot Note: * Significant at 1 % level ** Significant at 5% level

PFPL – Partial factor productivity of labour PFPK – Partial factor productivity of Capital

TFPI – Total Factor Productivity index W/V – Unit Labour cost K/L – Capital Intensity

It is observed from the table that the co-efficient of determination (R^2) was high for all measures of productivity. It varied between 93 percent and 96 percent. It means that 93-96 percent of the variation in the growth of all measures of productivity were due to the influence of time factor alone. The remaining variation may be due to other unexplained variables. The estimates showed that labour productivity index had shown an increasing trend upto the period 2007-08 and it was 307. This accounted for more

than 3 fold increase. The average annual trend rate of growth of labour productivity was 13.25 percent for the entire period. The index of capital productivity had shown an increasing trend but the increase had not been uniform. The index fluctuated throughout the study period. The capital productivity had shown a positive growth of 7.86 percent annum. The trend rates explained that the indices of total factor-productivity had shown a positive growth of 10.52 percent. It is of interest to know how unit – labour cost have behaved. The index had declined to touch a low level of 34 units in 2007-08, the rate of decline being 5.80 percent for the entire period. The index of capital intensity had increased during the study period at the exponential trend rate of 2.10 percent. Thus, the increase in labour productivity seems to have been made possible due to more machine per-worker effect. However, it is important to note that in a situation where capital intensity (K/L) was increasing overtime, the analysis for partial factor productivity changes would overstate the increase in labour productivity and understate the increase in capital productivity.

The productivity trends of urban industries of India are shown in table-2

Table - 2:Productivity trends in urban industries of India.

year	PFPL	PFPK	TFPI	K/L	W/L
1998-99	100	100	100	100	100
1999-00	105	91	98	115	103
2000-01	95	81	88	118	125
2001-02	98	77	87	128	125
2002-03	114	82	97	138	110
2003-04	135	93	112	146	95
2004-05	163	105	131	152	75
2005-06	171	104	133	163	67
2006-07	187	107	141	175	62
2007-08	222	133	158	196	59
$\overline{x}$	139	97	115	143	90
R^2	.895	.445	.987	.987	.725
β_1	10.08	3.71*	7.01**	2.90	-3.50
$t\beta_1$	0.654	8.258	2.584	24.588	-4.591

Source: Calculations are based on ASI data

Foot Note: * Significant at 1 % level ** Significant at 5% level

PFPL – Partial factor productivity of labour PFPK – Partial factor productivity of Capital

TFPI – Total Factor Productivity index W/V – Unit Labour cost K/L – Capital Intensity

The co–efficient of determination R^2 was observed high for total factor productivity index (0.987) followed by partial factor productivity of labour (0.895) and partial factor productivity of capital (0.445) . It explained the fact that the influence of time in bringing about change was more over total factor productivity index. In other words 98.7 percent, 89.5 percent and 44.5 percent change respectively in the growth of total factor productivity, labour productivity and capital productivity were due to the influence of time factor alone.

The analysis of partial factor productivity index of labour (PFPL) showed that though the labour productivity had increased to 222 at the end of the period. There had been fluctuations in the indices throughout the period of analysis. The annual trend rates revealed that labour productivity increased by 10.08 percent during the study period. The index of capital productivity (PFPK) had fluctuated throughout the period and had witnessed a trend rate of 3.71 percent in the over all period. The annual trend rates of total factor productivity index was positive. It was significant at 5 percent level. The unit – labour cost (W/L) had also shown fluctuating trend and there existed an inverse relationship between labour Productivity and unit –labour cost (W/L). For the entire period, the unit-labour cost had declined at an average exponential rate of 3.50 percent. The capital intensity (K/L) figures during the entire period were not consistent as revealed by the trend rates of growth. Taking the entire period of study, the capital intensity had grown at the trend rate of 2.90 percent per annum.

Comparison of trend rates of unit –labour cost and labour productivity showed that the trend rate of labour productivity was less than unit –labour cost trend rate during the entire period. There existed inverse relationship between the two. This seems to indicate flexibility in the behaviour of wages. The above analysis indicated that in this industry increasing labour productivity was accompanied by declining capital productivity and rising capital intensity based on absolute figures implying the presence of idle capacities and inefficiency in the use of resources especially capital.

The productivity trends in urban industries are shown in table-3

Table-3: Productivity trends in Aggregate Industries of India

Year	PFPL	PFPK	TFPI	K/L	W/V
1998-99	100	100	100	100	100
1999-00	108	101	104	107	100
2000-01	103	93	98	110	116
2001-02	105	88	96	120	117
2002-03	122	99	110	123	97
2003-04	144	110	126	131	85
2004-05	172	127	148	136	68
2005-06	191	149	169	101	59
2006-07	219	136	173	161	50
2007-08	257	139	189	184	45
$\bar{x}$	149	114	131	.127	84
R^2	.929	.717	.882	.587	.818
β 1	11.65*	5.36**	8.49*	2.20	-4.50
tβ 1	10.23	4.588	7.717	3.375	-5.990

Source: Calculations are based on ASI data
Foot Note: * Significant at 1 % level ** Significant at 5% level
PFPL – Partial factor productivity of labour PFPK – Partial factor productivity of Capital
TFPI – Total Factor Productivity index W/V – Unit Labour cost K/L – Capital Intensity

It was observed that the co-efficient of determination R^2 was high for partial factor productivity of labour (PFPL) followed by total factor productivity index (TFPI) and partial factor productivity of capital (TFPK). The influence of time factor in bringing about growth of labour productivity was 92.9 percent, on labour productivity 88.2 percent on total factor productivity and 71.7 percent on capital productivity. The indices of partial factor productivity of labour (PFPL) had increased more than two fold (2.57) while capital productivity (PFPK) had increased by only 1.39 units during the study period. The annual trend rate of growth in labour productivity was 11.65 percent, while the decline in capital productivity was 5.36 percent during the entire period which was significant at 5 percent level.

In terms of annual trend rate, the total factor productivity had increased at the rate of 8.49 percent which was significant at one percent level. Taking the entire period of study, the unit – labour cost (W/V) had declined by 4.50 percent. The decline in unit-labour cost along with increase in labour productivity indicated that wage increase had been less than the increase in labour productivity. The increase in labour productivity was due to increase in capital intensity. Capital intensity (K/L) registered a growth 2.20 percent.

Taking Total Factor Productivity Index (TFPI), partial factor productivity of labour (NVA/L), partial factor productivity of capital (NVA/K) as dependent variable and LnNVA, LnW, LnK and LnT as independent variables multiple linear regression model was applied to analyse the major determinants of productivity.

Determinants of productivity

Table-4 below gives details regarding the results of multiple linear regression model applied for rural industries.

Table – 4: Multiple linear regression co- efficients- rural industries

Dependent Variable	Coefficient of Constant	LnNVA	LnW	Ln K/L	LnT	R^2	DW – Statistic	F -ratio
LnNVA/L	88.773* (3.497)	-.412* (7.586)	-.587 (-1.347)	-.230*** (2.999)	8.029* (7.365)	.998	1.924	962.561
LnNVA/K	230.604*** (10.050)	.290* (5.907)	-.456 (-1.158)	-1.218 (-2.470)	-9.468 (9.609)	.995	2.031	261.229
Ln TFPI	172.555*** (7.103)	.360*** (6.914.)	-.357 (-.857)	-.802*** (-1.836)	8.908* (8.538)	.998	1.924	517.549

Source: Estimation based on ASI data.

Foot Note: (i) Figures in parantheses are 't' values of the estimates;

(ii) *Significant at 1% level; *** Significant at 5% level

The results regarding determinants of productivity in rural industries showed that net value added (LnNVA) was positively related to capital productivity (LnNVA/K) and to total factor productivity index (LnTFPI). The increase in net value added (LnNVA) might have increased productivity over the period because of (i) technical progress and (ii) economies of scale (both internal and external). The negative association between total factor productivity (LnNVA/L)and wage rate (Lnw) indicated that higher wages resulted in lower productivity –disapproving efficiency–wage hypothesis. The significant negative relationship between labour productivity (LnNVA/L) and capital intensity (LnK/L) implied that the presence of too many machines had brought down the productivity. The co-efficient of time (LnT) was negatively related to capital productivity. This implied that labour management relation and other institutional factors have adversely affected capital productivity in these industries. The co-efficient of R^2 explained the fact that more than 99 percent of changes were brought about by the factors such as net value added (LnNVA), wage rate (LnW) capital intensity (LnK/L) and time element (T) and the remaining one percentage change was due to other unexplained variables.

The result of multiple linear regression model applied for urban industries are shown in table-5.

Table - 5: Multiple linear regression co-efficients– Urban industries

Dependent Variable	constant coefficient	Coefficient of						
		LnNVA	LnW	Ln K/L	LnT	R^2	DW–Statistic	F-ratio
LnNVA/L	48.311	.622*	-.456	.323	1.796	.992	1.632	149.559
	(1.134)	(6.266)	(-.631)	(.344)	(.310)			
LnNVA/K	54.025	.463*	-.082	.082	-4.776	.928	1.716	16.133
	(1.158)	(4.266)	(-.104)	(-.104)	(-.754)			
Ln TFPI	113.097*	.480*	-.609	-.028	1.773	.980	1.5960	61.527
	(3.187)	(5.624)	(-.980)	(-.035)	(.356)			

Source: Estimation based on ASI data.
Foot Note: (i) Figures in parantheses are't' values of the estimates;
(ii) *Significant at 1% level;

Functions explaining determinants of productivity in urban industries indicated that all measures of productivity were significantly related to net value added (LnNVA). Wage rate (LnW) and capital intensity (Ln K/L) were negatively related to all forms of productivity. Higher the wage rate lowers the productivity and vice-versa and the influence of capital intensity was (Ln K/L) was insignificant. Time variable (LnT) was showing insignificant trend in explaining changes in all measures of productivity. This implied that institutional factors had adversely affected productivity in urban industries. The co-efficient of determination R^2 explained the fact that more than ninety percent of the variation in dependent variables were mainly due to the combined influence of the independent variables.

Determinants of productivity in the aggregate industries based on multiple linear regression model is shown in table-6.

Table – 6: Multiple linear regression co-efficients– aggregate industries

Dependent Variable	constant coefficient	Coefficient of				R^2	DW– Statistic	F-ratio
		LnNVA	LnW	Ln K/L	LnT			
LnNVA/L	84.008**	.570*	-.838	-0.0485	5.384*	9961	.743	355.371
	(2.356)	(10.217)	(-.835)	(-.466)	(3.781)			
LnNVA/K	195.433*	.343*	-.838*	-.500*	4.775*			
	(4.890)	(5.481)	(-1.835)	(-4.308)	(3.992)	.971	1.718	2.152
LnTFPI	155.084*	.431*	-.713	-.323	5.711*	.990	1.689	26.786
	(4.070)	(7.225)	(-1.637)	(-2.913)	(3.754)			

Source: Estimation based on ASI data.
Foot Note: (i) Figures in parantheses are't' values of the estimates;
(ii) *Significant at 1% level; (iii) **Significant at 5% level.

Different regression functions explaining the changes in partial and total factor productivity indices overtime revealed that the co-efficient of net value added (LnNVA) was positive and showed significant relations between the variables such as labour productivity (LnNVA/L), capital productivity (LnNVA/K) and total factor productivity index (LnTFPI). This explained that as the scale of output increases the level of productivity also increases. The productivity change had negative sign with wage rate and capital intensity(LnK/L), implying insignificant relationship with wage rate (LnW) and capital intensity. The co-efficient of time variable (LnT) was positive and significant indicating that the institutional factors have influenced all forms of productivity indices overtime. The co-efficient of determination R^2 revealed that 97 to 99 percent of the variation in the dependent variables of partial as well as total factor productivities was mainly due to the combined effect of independent variables such as net value added (LnNVA), capital intensity (LnK/L), wage rate (LnW) and time factor (LnT). Neglible percentage was due to other unexplained variables.

Conclusion

From the above discussions ,it may be concluded that the trend rates of partial and total factor productivity indices were positive.The analysis also revealed an inverse relationship between labour productivity and unit labour cost in these industries. Significant relationship existed between all forms of productivity indices. The following recommendations are made for the future growth of these industries. The nation wide linkage of wages with productivity may be the best option for neutralization of a rise in the cost of living. The productivity of capital and total factor productivity may be taken into account along with labour productivity while granting wage increase so that wage increase is not of inflationary nature. Effective utilization of capital should the correct criterion for a country like India where capital is a scarce factor.In order boost the total factor productivity growth there is a pressing need to harmonise the industrial relations

with workers and management.In this context amendments in labour laws,greater participation of workers in management andrehabilitation of workers especially in case of disinvestment of public sector units are some spheres which require quick attention of policy makers to create conducive environment.

REFERENCES

Arora, V. and Singh, P. (2008), "Economic Reforms and Productivity Growth in Indian Manufacturing Sector: An Interstate Analysis", **ICFAI Journal of Industrial Economics**, 5 (3): 35-45.

Bantekas, P.(2008), "Multifactor Productivity in the Construction Industry under Imperfect competition",**ICFAI Journal of Industrial Economics**,Vol.5, No.3, Pp.28

Manjappa, D.H. and Mahesha, M. (2008), "Productivity Performance of Selected Capital- Intensive and Labour –Intensive Industries in India during Reform Period: An Empirical Analysis", **ICFAI Journal of Industrial Economics**, Vol.V, No.4, Pp.57-65.

Manpreet Kaur and Ravi Kiran(2008), Indian Manufacturing Sector: Growth and Productivity under the new policy regime, **International Review of Business Research papers** vol.4, No.2, Pp 20-60.

Rajan S.S., Reddy K.L.N. and Pandit. V. (2008), "Total Factor Productivity in selected Indian Manufacturing Industries", **ICFAI Journal of Industrial Economics**, Vol.5, No.1, Pp.51-63.

Ravi Kiran(2008), Dynamics of productivity in Indian manufacturing Industrial.Management, '**International Review of Business Research papers** ,vol.4 No.2, pp 136-150.

Websites :www.Annualsurveyofindustries.com

Arora, V. and Singh, P. (2008), "Economic Reforms and Productivity Growth in Indian Manufacturing Sector: An Interstate Analysis", **ICFAI Journal of Industrial Economics**, Vol.5, No.3, Pp.35-45.

Arora, V. and Singh, P. (2008), "Economic Reforms and Productivity Growth in Indian Manufacturing Sector: An Interstate Analysis", **ICFAI Journal of Industrial Economics**, Vol.5, No.3, Pp.35-45.

Banga, R. (2004), "Impact of Japanese and US FDI Productivity Growth",**Economic and Political Weekly**, Vol.39, No.5, Pp.453-460.

Bantekas, P.(2008), "Multifactor Productivity in the Construction Industry under Imperfect competition",**ICFAI Journal of Industrial Economics**,Vol.5, No.3, Pp.28 35.

Biswanth Golder (2001)," Technology Aqusition and Productivity Growth-A Study of Large Chemical firms in India", **The Asian Economics Review**, Vol.43, No.2. Pp.457-469.

Deb Kusum Das (2004)," Manufacturing Productivity under Varying Trade Regimes", 1980-2000, **Economic and Political Weekly**, Vol.XXXIX, No.5, Pp.423-433.

Hay, D.A., (2002), "The post-1990 Brazilian Trade Liberalization and the Performance of Large Manufacturing Firms: Productivity, Market Share and Profits", **The Economic Journal**, Vol. 3, No. 473, Pp. 620-641.

Jeyamalathi and Manonmani, M. (2004), "Productivity in Selected Manufacturing Industries in Tamil Nadu" – **Post Graduate Thesis.** Krishnamurthy, V., (2007), "Manufacturing sector in India: A review", **Industrial Herald**, Vol. 21, No. 2, Pp. 43-57.

Laxminarayan, (2003), "Productivity and Wages in Indian Industries", **Discovery Publishing House**, New Delhi.

Linz, S. (2000),"Labour Productivity in Transition: A regional Analysis of Russian Industry", **Economic Development and Cultural Change**, Vol.48, No.4, Pp.685-718.

Manpreet Kaur and Ravi Kiran(2008), Indian Manufacturing Sector: Growth and Productivity under the new policy regime, International Review of Business Research papers vol.4, No.2, Pp 20-60

Mupender and Sujan, M. (2008), "Co integration Between Labour Productivity and Wage Rate: Empirical Evidence from the Indian Industries", **ICFAI Journal of Industrial Economics**, Vol.3, No.7, Pp.74-95.

Rajan S.S., Reddy K.L.N. and Pandit, V. (2008), "Total Factor Productivity in selected Indian Manufacturing Industries", **ICFAI Journal of Industrial Economics**, Vol.5, No.1, Pp.51-63.

Ravi Kiran(2008), Dynamics of productivity in Indian manufacturing Industrial.Management'**International Review of Business Research papers** ,vol.4 No.2, pp 136-150.

Siddharthan V.S. and Lalk (2004), "Liberalisation, MNL and Productivity of Indian Enterprise", **Economic and Political Weekly**, Vol.XXXIX, No.5, Pp.448-452

Susan J. Linz, (2000), "Labour Productivity in Transition : A Regional Analysis of Russian Industry", **Economic Development and Cultural Change**, Vol.48, No. 4, Tarlok Singh (2000) , " Total Productivity in the Manufacturing Industries in India", The Indian Economic Journal, Vol.48, No.2, Pp.108-117. under the New Policy Regime, **International Review of Business Research** Vol. 4 No.2, Pp.136-150.Pp. 685-718.

Websiteswww.Annualsurveyofindustries.com

www.Google.com

JOURNAL OF
EDUCATIONAL PLANNING AND ADMINISTRATION
Editor: Jandhyala B.G. Tilak

Volume XXV | Number 3 | July 2011

CONTENTS

Annual Subscription Rates

Individuals: ₹150/US $ 60 Institutions: ₹350/US $ 85

Advertisement Tariff

Full Page: ₹2,000/US $ 100 Half Page: ₹1,100/US $ 55

National University of Educational Planning and Administration
17-B, Sri Aurobindo Marg, New Delhi 110016 (India)
Phone: 91-11-26863562, 26962120; Fax: 91-11-26853041, 26865180
E-mail: Editorial: *jepa@nuepa.org*; Other: *publications@nuepa.org*
Website: http://www.nuepa.org