By Contibution

Total Factor Productivity of Indian Corporate Manufacturing Sector

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This study attempts to examine the non-parametric index number approach of measuring total factor productivity dring 1999/00- 2010/ 11 for the Indian corporate manufacturing sector. The approach includes Kendrick index, Solow index and Translog index. It was found that in the private limited companies all the indices of total factor productivity except, Kendrick method had shown increasing trend. In public corporations except Translog all the other total factor productivity indices had shown negative trend rates. In government departmental enterprises the total factor productivity indices of all the methods showed a declining trend. The total factor productivity indices of aggregate corporate sector revealed that excepting Kendrick index, all the other total factor productivity indices had increased.

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Introduction

As a reaction to the colonial past, India's development strategy focused on self- reliance. In pursuit of the same, it placed a heavy emphasis on the creation of a well- diversified industrial base to realize the dream of industry-led development. Though this strategy assigned the prime responsibility of developing heavy industries to the public sector, private sector was also allowed to play a supplementary role. Almost until the beginning of the eighties, a myriad of measures to control the private sector, such as, licensing requirement for installation of capacities, quantitative and tariff restrictions on imported inputs, regulation of monopolies and restrictive trade practices, foreign exchange regulation, nationalization of commercial banks and price controls, constituted an integral part of India's industrial policy. The socialistic fervor in the minds of policy makers got reflected in the policy measure, such as, reservation of labor-intensive manufacturing products for the small scale industries (SSIs), pref-

erential treatment to the SSIs and stringent labor laws against firing of labor in large firms. The industrial policy was primarily designed to protect the 'infant' industries from external competition. Unfortunately, the policy inhibited internal competition as well. By the end of seventies, Indian manufacturing suffered from high costs of production, sub-standard quality of products and lack of competitiveness of its exports. It is no surprise that the regulatory framework of the pre-1980s, inter alia, has been held responsible for the low growth rate of output and productivity of India's manufacturing sector (Pushpa Trivedi et.al, 2011**).**

By the end of seventies, Indian manufacturing suffered from high costs of production, sub-standard quality of products and lack of competitiveness of its exports.

The first bout of industrial policy reforms that were initiated in the eighties attempted to lift the economy from industrial stagnation through measures, such as removal of hurdles on capacity expansion, enabling availability of imported inputs and liberalization from price controls. The primary intent of these reforms was to unleash the growth potential of India's industrial sector. The second bout of reform process was initiated in 1990-91 in the wake of macroeconomic crisis. Economic and institutional reforms are being fine-tuned since then, depending on the unfolding of situations both at the external and domestic fronts. It may also be worth noting that the reforms of the eighties were centered primarily on industrial and fiscal sectors, whereas, the macro- economic reforms initiated in the early nineties were more comprehensive. Stabilization and structural adjustment process constituted the core of reforms in the nineties and these were deemed to be pre-requisites for the pursuit of growth and viable balance of payment. In brief, the reforms in the nineties differed in their characteristics from those of the eighties. The reforms in the eighties have been branded as 'pro-business', whereas, the latter as 'pro-market'.

It has been argued by Ahluwalia (1991) that the reforms of the eighties resulted in an upward shift in growth rate and productivity of theIndian economy and in particular that of the industrial/manufacturing sector. The comprehensive reforms of the nineties gained wide publicity as these pulled the economy from a crisis situation and succeeded in alleviating foreign exchange constraint and controlling inflation. As substantial liberalization in terms of tariff reductions and removal of quantity restrictions on imported inputs (needed for growth of manufacturing sector) took place during the nineties, it was expected that these reforms would also enable the economy to follow growth and productivity paths higher than those witnessed during the eighties. However, no such structural break in either growth or productivity is evident after the initiation of reform process of the nineties. Perhaps, the reforms of nineties targeted primarily the external and financial sectors, which have impacted the real sector indirectly.

The Emphasis

The emphasis that needs to be placed on productivity has been well articulated in the literature. A higher growth path on account of higher productivity is considered to be a preferable alternative as compared to that due to increased application of inputs. The latter is deemed to be unsustainable due to supply constraints and also due to the phenomenon of diminishing returns. However, this can be a contentious issue, if it pertains to application of labor input, especially so in the context of a labor abundant economy like India. If increased productivity is attained by downsizing employment, it may not bode well for the social fabric and it ought to be a cause of concern to the policy makers. As the basic objective underlying the argument for increasing productivity is to increase social welfare, a situation of rising productivity coupled with shrinking employment may be neither socially desirable nor politically sustainable. A higher growth path, enabled by productivity growth and combined with 'employment generation' ought to be considered as an ideal trajectory from the point of view of sustainable growth of an economy. The link between productivity and social welfare (poverty alleviation) can best operate through employment generation. The importance of productivity in poverty reduction via employment generation has been duly emphasized in the World Employment Report 2004-05 (International Labor Office, 2005), by an apt choice of theme for the report, viz., 'Employment, Productivity and Poverty Reduction'. In other words, increase in productivity needs to be conceived merely as a means to an end (i.e., social welfare) and certainly not as an end in itself.

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Though the concepts of productivity, efficiency and competitiveness are indicators of performance, these need not necessarily move in tandem with each other. These terms have rather different conceptual underpinnings and hence, the policy makers need to focus on the movement of each of these in accordance with the socio-economic objectives. As regards the two concepts of productivity viz., labor productivity and total factor productivity (TFP), these are pertinent for policy makers, since the former has a direct link to standard of living and the latter indicates the economical use of resources in the process of production. 'Productivity' per se is a descriptive measure of performance and it can be estimated independently for a decision making unit.

The share of manufacturing sector in India's real GDP has risen over the years. However, this increase has not matched the expectations for two main reasons. First, the expectations from manufacturing sector were high due to the emphasis on heavy industries led development in the planning process in India; and, second, the countries with similar levels of development on the eve of planning in India, especially the East-

Asian Economies including China, have been able to make their presence felt in the global market for manufacturing products to a far greater extent than India.

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 now being recognized as an important policy lever for economic development. Advocates of liberalization argue that opening up of local markets to foreign competition and foreign direct investment will help improve the productivity of domestic industry, resulting in more efficient allocation of resources and greater overall output. Productivity and efficiency are the two most important aspects to describe the relative performance of firms, producers or production units. It is necessary in this connection to recognize those factors which are exogenous to the system of production and which can account for inter-firm variations in efficiency and productivity.

Productivity growth has been one of the most popular areas of applied economic research as it is based on the well-defined analytical framework of the standard economic theory of the production function (Ravi Kiran & Manpreet Kaur, 2008). But the primary weakness of this approach of measuring performance of production units through productivity growth is that it does not allow for the distinction between changes in technology and those in the efficiency with which a known technology is applied to production. Thus technological progress and efficiency of factor use cannot be disentangled. But productivity across firms in an industry may vary due to technological differences, due to differences in the environment in which the production unit or firm operates. The traditional methodology of measuring productivity based on the standard definition of production function implicitly assumes that maximum output is attained by firms or production units for given levels of inputs. That is, output maximization is an implicit assumption. The economic development of a country depends mainly on industrial development. In manufacturing sector, the scope for internal as well as external economies is greater than in other sectors. It acts as an instrument both for creating capacity to absorb excess labor power and for diversifying the market required to boost economic development. The present study is an attempt to analyze the productivity in the manufacturing sector of India, disaggregated in to various corporate manufacturing sectors.

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Methodology

Net Value Added (NVA) was taken as output, since trends are not affected significantly by the use of net value added.

Also ambiguity in the calculation of depreciation can be overcome if the net value added is taken as a measure of output. Labor input consisted of workers directly involved in production the fixed capital was taken into account as capital input. Wages included remuneration paid to workers. The basic data source of the study was the Annual Survey of Industries (ASI) published by Central Statistical Organization (CSO), Government of India covering the period from1999-00 to 2010-11. All the referred variables were normalized by applying Gross Domestic Product (GDP) deflators. 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.

The following statistical tools were applied to analyze the data which was applied in the studies of Laxminarayan (2003)

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. Labor 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.

Total factor Productivity Indices

The study had analyzed productivity in the selected industries using a non-parametric index number approach explained below:

i. *Direct Method Index:* 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 for labor and capital were calculated by applying direct method index formula as follows.

TFPDM =√PFPLX PFPK.(square root of partial factor productivity of labor (PFPL) multiplied with partial factor productivity of capital(PFPK)

ii. *Kendrick Index* of TFP (Total Factor Productivity) is an arithmetic measure because here tangible factor inputs are an arithmetic average of labor and capital input. As Kendrick puts it the fact that total factor input index is the weighted arithmetic mean of labor and capital input indices (rather than geometrical mean) implies a logarithmic linear relationship within successive sub periods." This measure of TFP is based on the linear production function of the form:

V= aL +bk

Where V is output L and K are labor and capital respectively, and 'a' and 'b' are coefficients of labor and capital. A weighted input index is prepared by combining labor and capital inputs using in appropriate weights. The weights may either be the prices of labor and capital or the percentage shares of labor and capital in the total value added. The weighted inputs of labor and capital in each year

are added to get total input index. Then, an index of output as also of total input is prepared. The ratio of output to total input index will yield the arithmetic TFP index. Symbolically, it may be expressed as:

$$TFPKt = VT/ (a0\ Lt + boKt).$$

Where V is an index of output, L and K are indices of capital and labor in year t and TFPK is the Kendrick Index for time t. However as Mehta (1980) points out that this function poses some uncomfortable theoretical problems. By re-arranging terms, equation can be written as:

$$VT=TFPKt\ (aoLt+boKt)$$

From this it can be seen that regardless of how fast capital is growing in relation to the labor this ratio remains same. Thus, marginal rate of substitution is assumed to remain constant regardless of the changes in factor proportions. The assumption of linear production function, prefect competition, prefect substitutability between labor and capital are implied. The weights here are not derived from a statistical function but from the base year which would be equal to one by definition.

iii. Solow index: Solow's geometric index of TFP is given by the parameter A (t) in the multiplicative production function of the form:

$$V=A\ (t)\ L^{\alpha}\ K^{\beta}$$

Taking logarithms and differentiating with respect to time we have

$$V'/V = A'/A+\alpha\ L'/L +\beta K'/K$$

For discrete changes the above equation may be written as:

$$\Delta A/A = \Delta v/v- [\alpha(\Delta L/L) +\Delta\ K/K]$$

Where A/A is the rate of change of TFP; $\Delta V/V$ is the rate of change of output; $\Delta L/L$ and $\Delta K/K$ are the rates of change of labor and capital and are the share of labor and capital in total income. Thus, rate of change of TFP is the difference between the rate of change of output and the weighted sum of the rate of change of inputs.

iv. Translog Index: The Translog index of total factor productivity is derived from Translog production function under the assumption of constant returns to scale and competitive equilibrium. It also assumes that factor price is paid according to their marginal productivity. This index is the discrete version of continuous Divisia index. Divisia index satisfies both factor reversal and time reversal tests for the index number. Its functional form is derived as follows:

Considering an aggregate production function with two factors of production which is homogeneous of degree one, we have:

$$Y=F\ (K, L, T)$$

Denoting factor prices by P, marginal shares of factor input can be defined as:

$$SL=(PK.K)/(PQ.Y) \text{and}$$
$$SL=(PL.L)/PQ.L).$$

Under constant returns to scale:

$$SK + SL = 1$$

The rate of technical change may be defined as the rate of growth of output with respect time holding inputs constant. Symbolically:

$$\Delta ST = LnY/\delta t$$

Under constant returns to scale, the rate of technical change can be expressed as the rate of growth of output less a weighted average of rate of growth of inputs (capital and labor) and weights being their respective shares. Symbolically:

$$\Delta ST = (\delta LnY/\delta t) - [(SK = \delta LnK/\delta t) + (SL = \delta LnL/\delta t)]$$

Where S is the Divisia Index of the rate of technical progress and the figures in bracket [ ] in above equation, may be written as LnI/ t, is the Divisia Index of input. Thus, TFP is measured here as the difference between the rate of growth of value added and rate of growth of inputs (total factor input). The above equation is for the continuous time framework and to apply it for real world, a discrete time approximation is needed. The Translog index is a discrete version of continuous Divisia Index. In this average rate of technical change is defined as follows:

$$\Delta ST = \Delta LnY - (S\,L\,\Delta LnK + L\,\Delta LnL).$$

Here

$$= 1/2\,[SK(t) + SK(t-1)]$$

$$=1/2\,[SL(t) + SL(t-1)]\ \Delta LnY = LnY(t) - LnY(t-1)$$

$$\Delta LnK = LnK(t) - LnK(t-1)$$

$$\Delta LnL = LnL(t) - LnL(t-1)$$

And ΔST is called the Translog Index of the rate of technological change.

Public Limited Companies

Productivity trends (partial and total factor productivity) in public limited companies is presented in Table 1.

The detailed time trend estimates of public limited companies revealed that labor productivity index had shown an increasing trend up to 2010-11. This accounted for more than 3 fold increase. The average annual trend rate of growth of labor productivity was 17.33 per cent for the entire period which was statistically significant at 5 percent level of significance. 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 increase in Indices of Total Factor productivity (Direct Method) was noticeable. The trend rates in the indices of Total Factor Productivity by direct method, solow and Translog methods had shown a positive growth of 8.2 percent, 2.53 percent and 1.2 percent respectively while the Kenrick Index had shown a decline of 2.1 percent. It is of interest to know how unit-labor cost has behaved. The index had

Table 1 Productivity Trends in Public Limited Companies (1999-2000=100)

Year	Indices of Partial Factor Productivity		Indices of Total Factor Productivity				Unit Labor Cost (w/v)	Capital Intensity (Fc/L)
	Labor	Capital	Direct Method	Kendrick	Solow	Translog		
1999-2000	100	100	100	100	100	100	100	100
2000-2001	97	95	95	99	56	97	101	102
2001-2002	100	84	92	120	56	102	109	118
2002-2003	123	96	109	100	74	101	91	127
2003-2004	147	110	127	90	100	98	78	133
2004-2005	177	132	153	84	133	97	67	134
2005-2006	193	122	153	80	219	100	63	157
2006-2007	220	136	173	79	567	91	58	161
2007-2008	250	56	190	79	432	103	55	172
2008-2009	241	117	168	87	563	109	63	205
2009-2010	228	88	141	101	463	123	74	254
2010-2011	318	116	192	90	416	136	59	273
				Annual Trend Rates				
β-value	17.33*	3.27	8.2**	-2.1	2.53**	1.2	-6.0**	8.41**
R^2	0.924	0.002	0.89	0.268	0.758	0.29	0.685	0.877
t-value	10.452	0.14	8.852	-1.815	5.308	1.917	-4.422	8.001

Source: Calculations are based on ASI data
* Significant at 5% level
** Significant at 10% level

declined to touch a low level of 59 units in 2010-11, the rate of decline being 6.0 per cent. This showed that even significant increase in labor productivity and total factor productivity could not reduce the unit-labor cost based on Direct Method, Solow and Translog methods during this period. The index of capital intensity had increased during the study period at the exponential trend rate of 8.41per cent with 10 percent level of statistical significance. Thus, the increase in labor 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 (FC/L) has been increasing overtime, the analysis for partial factor productivity changes would overstate the increase in labor productivity and understate the increase in capital productivity.

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Private Limited Companies

Details of productivity trends in private limited company is presented in Table 2

Table 2 Productivity Trends in Private Limited Companies (1999-2000=100)

Year	Indices of Partial Factor Productivity			Indices of Total Factor Productivity			Unit Labor Cost (w/v)	Capital Intensity (Fc/L)
	Labor	Capital	Direct Method	Kendrick	Solow	Translog		
1999-2000	100	100	100	100	100	100	100	100
2000-2001	100	94	96	226	21	108	102	106
2001-2002	104	82	93	68	46	118	104	124
2002-2003	100	100	100	189	26	135	11	101
2003-2004	126	100	114	89	53	126	88	126
2004-2005	140	106	121	49	29	148	85	133
2005-2006	206	135	168	26	121	182	67	156
2006-2007	187	129	157	33	21	196	74	148
2007-2008	217	124	164	31	65	215	71	175
2008-2009	266	135	193	28	53	246	66	20
2009-2010	285	124	189	31	61	283	68	238
2010-2011	319	116	179	44	192	369	74	329
Annual Trend Rates								
B-value	12.01*	2.8**	6.5**	-1.6**	-0.16	11.2**	-0.006	0.038
R^2	0.921	0.389	0.756	0.475	0.013	0.881	0.099	0.315
t-value	10.774	2.526	5.569	-3.009	-0.36	8.609	-1.047	2.145

Source: calculations are based on ASI data
* Significant at 1% level
** Significant at 5% level

All the indices of total factor productivity except, Kendrick method had shown increasing trend.

The indices of partial factor productivity of labor in private limited company had increased more than three-fold, while capital productivity had increased only by 16 units during the study period. The annual trend rate of growth in labor productivity was 12.01 per cent, while in capital productivity it was 2.8 per cent during the entire period. All the indices of total factor productivity except, Kendrick method had shown increasing trend. In absolute terms there was an increase of 79 units 92 and 269 units respectively in Direct, Solow and Translog methods. In terms of annual trend rate, the Total Factor Productivity had declined at the rate of 1.6 per cent in Kendrick Method. Taking in to consideration the entire period of study, the unit-labor cost had declined by 0.06 per cent. The decline in unit-labor cost along with increase in labor productivity indicated that wage increase had

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Public Corporations

Trends in productivity trends of Public Corporations is presented in Table 3.

Table 3 Productivity Trends in Public Corporations (1999-2000=100)

Year	Indices of Partial Factor Productivity			Indices of Total Factor Productivity			Unit Labor cost (w/v)	Capital Intensity (Fc/L)
	Labor	Capital	Direct Method	Kendrick	Solow	Translog		
1999-2000	100	100	100	100	100	100	100	100
2000-2001	96	92	94	235	235	900	100	100
2001-2002	101	89	95	246	595	848	100	100
2002-2003	191	161	175	88	119	1028	100	100
2003-2004	291	204	244	69	638	1018	85	133
2004-2005	468	306	378	54	35	1025	85	133
2005-2006	572	332	436	39	80	976	62	133
2006-2007	543	103	236	38	85	223	69	133
2007-2008	681	111	275	24	29	216	69	167
2008-2009	128	396	225	34	263	1011	62	167
2009-2010	928	234	465	31	53	1141	69	233
2010-2011	938	142	365	43	131	1005	69	300
Annual Trend Rates								
β-value	19.3**	6.60	12.9**	-17.5	-9.93	5.75	-4.74**	9.00**
R^2	0.65	0.161	0.552	0.513	0.118	0.051	0.779	0.75
t-value	4.307	1.383	3.509	-3.249	-1.155	0.736	-5.944	5.481

Source: Calculations are based on ASI data.
** Significant at 5% level

The partial factor productivity indices of Public Corporations showed an unexpected and appreciable increase in labor productivity and slight increase in capital productivity during the period of study. All the measures of total factor productivity except Kendrick method had also shown a upward trend. Positive trend rates were observed in partial factor productivity indices of labor and capital to the extent of 19.3 percent and 6.60 percent respectively. Among the total factor productivity indices except Translog indices all the other indices had shown negative trend rates. The analysis revealed an inverse relationship between labor productivity and unit-labor. Capital intensity had shown fluctuations throughout the period by registering an increase of 9 per cent per annum which was statistically significant at 5 percent.

Government Enterprises

The trends in productivity indices of government enterprises is presented in Table 4

Table 4 Productivity Trends in Government Enterprises (1999-2000=100)

Year	Indices of Partial Factor Productivity		Indices of Total Factor Productivity				Unit of Labor Cost (w/v)	Capital Intensity (Fc/L)
	Labor	Capital	Direct Method	Kendrick	Solow	Translog		
1999-2000	100	100	100	100	100	100	100	100
2000-2001	84	52	66	374	44	73	100	100
2001-2002	56	55	109	275	311	54	135	161
2002-2003	87	166	120	173	199	49	157	27
2003-2004	129	138	134	74	142	34	117	51
2004-2005	79	41	58	171	130	34	83	92
2005-2006	95	55	72	711	159	33	14	200
2006-2007	53	52	30	218	652	89	124	173
2007-2008	188	614	341	183	405	35	26	31
2008-2009	304	97	172	30	294	87	85	31
2009-2010	256	69	133	28	182	22	56	37
2010-2011	251	102	16	69	68	64	63	24
				Annual Trend Rates				
β-value	5.52**	3.63	-3.40	-13.3	5.80	-3.93	8.44**	-10.90
R^2	0.214	0.038	0.019	0.075	0.061	0.066	0.295	0.133
t-value	1.651	0.63	0.438	-0.901	0.087	-0.838	2.047	-1.237

Source: Calculations are based on ASI data
** Significantat 5 level

The analysis of partial factor productivity indices of labor in government department enterprises showed that though labor productivity indices had increased to 251 at the end of the period, there had been wide fluctuations throughout the period of analysis. The annual trend rates revealed that labor productivity increased by 5.52 per cent during the study period. The indices of capital productivity had fluctuated throughout the period and had witnessed a trend rate of 3.63 percent which was statistically not significant. The total factor Propuctivity indices of all the methods showed a declining trend, the annual trend rates of Total Factor productivity indices had shown positive trend rate of 5.80 percent, only in Solow method. But this was statistically proved as not significant. The unit-labor cost had also shown fluctuating trend and there existed an inverse relationship between labor productivity and unit-labor cost. For the entire period, the unit-labor cost had grown at an average exponential rate of 8.44 percent .The capital intensity figures during the entire period recorded a negative trend rate. The above analysis indicated that in this sector increasing labor productivity was accompanied by small increase in capital productivity and rising capital intensity, implying the presence of idle capacities and inefficiency in the use of resources especially capital.

Corporate Sector

Productivity trends in aggregate corporate sector is shown in Table 5

The indices of partial factor productivity of aggregate corporate sector revealed that from the beginning to the end of the period labor productivity had increased more than two-fold, whereas capital productivity had increased to the extent of 24 units. With regard to the annual trend rates, labor productivity had shown an increase of 10.80 per cent per annum at 5 percent level of significance during the study period, while the capital productivity had shown an increase to the extent of 3.72 per cent per annum at 10 percent level of significance . Excepting Kendrick index, all the other total factor productivity indices had increased. The Kendrick index had shown a decline of 81 units during the period. Unit-labor cost figures had shown an inverse relation with labor productivity.

Table 5 Productivity Trends in Aggregate Corporate Sector (1999-2000=100)

Year	Indices of Partial Factor Productivity			Indices of Total Factor Productivity			Unit Labor Cost (w/v)	Capital Intensity (Fc/L)
	Labor	Capital	Direct Method	Kendrick	Solow	Translog		
1999-2000	100	100	100	100	100	100	100	100
2000-2001	101	94	312	104	95	120	104	117
2001-2002	99	88	95	153	19	122	108	117
2002-2003	115	106	112	265	38	114	92	117
2003-2004	145	118	133	72	134	106	78	133
2004-2005	171	141	49	44	95	81	66	133
2005-2006	187	147	167	30	201	77	63	133
2006-2007	194	147	170	28	143	33	60	150
2007-2008	223	147	184	26	278	38	57	167
2008-2009	247	141	188	27	182	41	59	183
2009-2010	262	124	181	27	326	63	62	233
2010-2011	288	124	191	29	409	151	64	250
	Annual Trend Rates							
β-value	10.80*	3.72**	4.02	-18.4	18.66**	-6.31	-7.65**	8.42**
R^2	0.973	0.479	0.04	0.412	0.724	0.139	0.765	0.842
t-value	18.969	3.029	0.647	-2.648	5.128	-1.272	-5.705	7.303

Source: Calculations are based on ASI data
Foot note: Significant at 5% level

Conclusion

An economy could become an industrialized one if it gets its own efforts (i.e.) learning by doing, setting up different industries based on the local resources, development of social overhead and economic overhead capital like transport, health and education. The industries might be agro-based, forest based or mines

based. Development of higher infrastructural facilities in the form of power, roads and tele- communication facilities has to be a top priority for the policy makers to raise the productivity and efficiency of the factors used in the near future.

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