Performance of Manufacturing Industry in Indian States: Who loose and why?

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 Abstract: [This paper is an attempt to present the disparities of state-level performance of manufacturing industry on some key variables and tries to examine as to why the poorer states loose in relation to the richer ones. The study suggests that Indian states which could contribute to higher economic and administrative reforms during reform period by various fiscal measures did gain the boon of industrial achievements. So, in order to gain industrial uplift, the fiscal reforms of a state must help raising the income level of the particular state reflecting thereby to develop her economy by receiving the fruits of industrial development.]

   As is well known, the economic policy environment for industries in Indian states since 1991 has undergone unprecedented changes and has become much more competitive than past. Such a change has been effective mainly due to removal of industrial licensing system, drastic reduction in the number of industries reserved exclusively for public sector, treatment for FDI on par with domestic private investment and removal of restrictions on monopolies. As a result of such a change it is now well established that the inter-state disparities in the growth of gross state domestic product (GSDP)have increased in the post economic reform period beginning from the early nineties when compared to the eighties .In general, the richer states have grown faster than the poorer ones(Ahluwalia 2000;Dev and Ravi,2003;Bhattacharya and Sakthivel,2004).The GSDP from secondary sector during the post-reform period is one of the important factors for higher variability of inter-state disparities .The richer states have higher industrial growth during the post-reform period than the poorer ones due to, mainly, higher performance of manufacturing industries at state-level. This paper is an attempt to present the

disparities of state-level performance of manufacturing industry on some key variables and tries to examine as to why the poorer states loose in relation to the richer ones.

 The paper is organized as follows. Section II presents discussions on Industrial performance in major Indian states and the profit efficiency based on two important factors of Industrial performance among those states. The underlying reason influencing such industrial performance most among major Indian states during the period of economic reforms appears in section III along with the theoretical underpinnings of such argument .The empirical implications of such argument are contained in Section IV. Section V concludes.

Section II

<u>Industrial performance of Indian States</u>:

   The performance of the industries can be assessed, among others, by some key variables viz. employment, number of factories and value added. The percentage share of all these key variables to all India level have significantly increased to some of the states during the phase of economic reforms vis-à-vis other Indian states. The states which have experienced better performance in net value added and employment have been afforded to take the advantages of economic reforms through providing a series of reforms they made within their own states.

Table I: Performance of Manufacturing Industry in Major Indian States (For the span of 30 years):

States	Percentage shares of Major Indian States to All India								
	No of factories			Persons Employed			Net Value Added		
	77-78	88-89	04-05	77-78	88-89	04-05	77-78	88-89	04-05
A.P.	7.84	13.73	11.42	7.09	9.38	11.88	4.76	5.26	6.13
Assam	3.23	1.58	1.25	1.99	1.49	1.53	2.37	1.09	1.43
Bihar	4.27	3.31	2.41	5.92	4.9	2.56	5.17	7.44	6.8
Gujarat	10.04	10.67	9.97	8.31	8.72	9.2	10.04	9.78	13.86
Haryana	2.48	2.65	3.18	1.97	2.94	4.07	2.62	2.91	4.5
H.P.	0.46	0.25	0.48	.30	.67	0.51	0.5	0.86	.84
Karnataka	5.75	5.43	5.57	5.03	5.14	6.53	4.93	4.69	7.9
Kerala	4.41	2.95	4.03	3.96	3.02	4.16	2.73	2.74	1.56
M.P.	4.32	3.49	2.22	4.19	4.09	2.48	4.5	4.95	2.14
Maharastra	17.35	14.53	13.87	17.78	15.67	12.34	24.93	23.72	19.74
Orissa	0.99	1.37	1.28	1.76	2.0	1.77	1.97	2.55	2.33
Punjab	3.36	5.76	5.56	2.38	4.91	4.69	2.39	3.09	2.23

Rajasthan	1.91	3.04	4.25	2.19	2.99	3.15	2.39	2.55	2.53
TamilNadu	10.41	12.59	15.44	9.54	11.59	15.86	10.09	10.86	8.3
U.P.	9.68	9.04	7.03	9.97	9.77	6.86	6.38	8.59	5.5
W.B.	10.10	5.21	4.48	15.01	9.77	6.33	12.15	6.34	4.06

Source: Statistical Abstract.

Table I ,representing percentage share of major Indian states to all India level: net value added ,employment and number of factories in manufacturing industries, shows that during the period of economic reform Gujarat, Karnataka, Andhra Pradesh, Haryana, Assam ,Himachal Pradesh and Rajasthan registered better performance of all, when performance of all variables are taken together .Although the percentage share of number of factories of all India level registered some decreases ,but with regard to net value added and employment, their performance shows a significant increase in their shares. State wise, for Punjab, net value added shows some declining sign, whereas for other variable Punjab's position proves significant progress .Turning to Maharastra, one may find that although its share for all the variables shows some declining figures to its share in relation to all India level during reform period, the highest share of net value added is still occupied by Maharastra in 2004-05, the second highest share being registered in employment and factories. The poor industrial performance in all the variables is registered by West Bengal,Madhya Pradesh,Uttar Pradesh ,old Bihar and Orissa. But Orissa did much better than all other states which performed badly during the reform period.

Significantly as regards the other poorly performed states except West Bengal and U.P. are concerned, the historical industrial performance of all these states is poor during the past as

well as during the present. As regards the performance of West Bengal is concerned, the tradition of industrial development in manufacturing sector that West Bengal registered during the past has significantly deteriorated during the current years. Such a decline which started in the late 70's has been going on for this long time .It is worth mentioning that there is no other Indian states which did register such a decline during over 3 decades. West Bengal was the second major industrial states in terms of value added and number of employment, registering third highest position in the case of number of factories during 1977-78.,when the present left front government came into power. However during 28 years of their ruling starting from 1977-78 to 2004-05, the West Bengal industrial performance has been steeped down to the 8th position among major Indian states in the performance of all the variables namely number of factories, net value added and employment. The declining trend of all these key variables not only registered pre-reform period , but also worked out post economic reform.

The percentage share of West Bengal to all India with respect to number of factories, net value added and employment in manufacturing industry decreased from 10.10 to 4.48 percent, 12.15 to 4.06 per cent and 15.01 to 6.33 percent respectively for 28 years from 1977-78 to 2004-05.Most importantly ,the rate of decline for all the performance variable during their 28 years period is the highest for West Bengal of all major Indian states. If one compares the industrial performance during pre reform to post –reform period of existing left front regime ,one may find that the decline of all the variables is much higher during the pre-reform period than the post-reform period.

But if one compares relative performance of manufacturing industry between U.P. and W.B, the performance of all these variables for U.P.is not so poor as West Bengal. The relative position of U.P. during 28 years starting from 1977-78 to 2004-05 has more or less unchanged

among all Indian states. The data relating to performance at State level Public Sector Enterprise

of manufacturing industries (Table 2) are also in conformity with the findings of table 1.It shows

that West Bengal has registered the worst performance of state level public sector enterprise

among major Indian states. The performances of other major states are much better than that

of West Bengal state.

Table 2: Performance of state-level public sector enterprise:

States	Proportion of loss-making PSEs(%)	Proportion of PSEs with negative net worth(%)	Rate of return on capital(average)
Andhra Pradesh	15	14.8	10.0
Assam	17	20.9	-16.4
Bihar	70	11.1	-7.7
Gujarat	39	17.6	-8.9
Haryana	59	13.8	5.0
Himachal Pradesh	62	23.8	5.7
Karnataka	41	7.3	31.2
Kerala	61	14	-15.3
Madhya Pradesh	33	14.3	2.2
Maharastra	68	20.7	-4.6
Orissa	70	21.7	-35.0
Punjab	44	15.8	-12.0
Rajasthan	38	20.8	20.6
Tamil Nadu	53	29.4	-1.6
Uttar Pradesh	62	17.0	-29.9

West Bengal	72	44.2	-45.2

Source: OECD (2007) analysis of data from the Comptroller and Auditor General.

Efficiency of Industrial Performance:

Which state (states) did gain higher profit efficiency in manufacturing industry among major Indian states? While examining this issue we consider three main key variables: employment, productive capital and net value added. We examined the industrial performance of labour cost and productive capital on net value added during reform period based on three time points -78-79,88-89 and 03-04(Table 3).

The calculation of profit efficiency[1] seems to be essential as to know whether the richer Indian states which gain the fruits of industrialization could efficiently use the two most important factors-labour cost and productive capital- efficiently as compared with the poor Indian states which failed to gain the fruits of industrialization. Table 3 shows that except Andhra Pradesh all rich Indian states which did gain the fruits of such industrialization received higher profit efficiency during reform period, particularly during 1988-89 and 2003-04.Andhra Pradesh did fail to receive higher profit efficiency because of the fact that the incidence of her net value added were much below than the increment of her productive use of capital and labour.But West Bengal is also an exception because of the fact that despite being middle income state she loses both in quantitative as well as qualitative upliftment in industrialization during reform period.

Table 3: Measurement of Profit Efficiency among major Indian States

(Using DEA Analysis):

States	78-79	88-89	04-05
Andhra Pradesh	.58	.61	.50
Assam	.69	.75	.70
Bihar	.85	.77	0.62
Gujarat	.86	.80	.92
NBS Haryana	.79	.71	.75
Himachal Pradesh	.68	.73	.81
Karnataka	.72	.78	.84
Kerala	.57	.90	.72
Madhya Pradesh	.70	.75	.80
Maharastra	.78	.83	.86
Orissa	.56	.51	.46
Punjab	.54	.55	.82
Rajasthan	.56	.54	.76
Tamil Nadu	.95	.75	.80
Uttar Pradesh	.57	.58	.89
West Bengal	.84	.68	.65

Section III

What are the significant reasons as to why the poorer states loose in gaining industrial boon in relation to the richer ones during economic reform period?The economic survey report of OECD countries(in a study of 20 major Indian states)states that Indian states which could contribute to higher economic and administrative reforms by various measures did gain the boon of industrial achievements in these respective Indian states, where West Bengal registered the least fiscal reforms of all [2]. OECD(2007) report also argue, "to begin with the process of closing

the gaps in economic performance across states , the relatively restrictive states need to improve their regulatory environment so as to become more competitive and productive"(p.94). One may argue that already existing better infrastructure that prevailed before reforms is the most significant reasons for the industrial achievements of richer Indian states. As is well known, West Bengal is one of the middle income states like TN, Kerala, Karnataka , but before 1980 for infrastructural development she tops almost all Indian states. West Bengal registered second major industrial states in terms of net value added and number of workers employed and third in terms of number of factories. But as mentioned earlier, the industrial performance of West Bengal has been stepped down to the 8th position among Indian states during economic reform period. The fact is that the states which registered better industrial performance during reform period mainly due to higher fiscal reform did also register better infrastructural uplift during reform period.

So, the most significant force behind industrial uplift for richer Indian states during reform period is the higher economic and administrative reforms that they introduced by various fiscal measures. The following theoretical framework is an attempt to explore this issue:

We first try to explain the issue in the basic macroeconomic framework as to how an Indian state gain the fruit of industrial development and develop her economy when centre is the only controlling authority of monetary policy ,direct tax structure and there exists perfect capital mobility within Indian states. Then fiscal expansion must help raising the income level of the particular state reflecting thereby to develop her economy which might gain the fruit of industrial development (the theoretical framework appears in the appendix).In the macroeconomic framework the exogenous variables are M (monetary policy), P (price level), r

(interest rate) and the tax (T).The endogenous variables are G and Y. Then short term equilibrium condition in the goods market is determined by

y= C(y-$\bar{T}$) + I ($\bar{r}$) + G … (1) [where y is income, G is government expenditure ,I is investment , $\bar{r}$ is rate of interest and $\bar{T}$ is fixed tax (they are executed by central government).

In linear equation (1) may be written as y = δy′ - λ$\bar{r}$ +G…(1a) [y′ = disposable income]

The first step is to solve for income levels in terms of interest rate

y= kG -$\beta\bar{r}$ …(1b)

Similarly the money market equilibrium is

($\bar{M}/\bar{P}$) = L ($\bar{r}, y$)… (2)

Where monetary policy: $\bar{M} \; and \; \bar{P}$ are constant.

In linear form (2) can be written as ($\bar{M}/\bar{P}$) =Øy- ηr…..(2a)

The second step is to solve (2a) for income in terms of interest rate

y= 1/Ø(($\bar{M}/\bar{P}$)+ η$\bar{r}$)….(2b)

Then market equilibrium conditions are (equating 1b with 2b)

Kg - $\beta\bar{r}$ = 1/Ø(($\bar{M}/\bar{P}$)+ η$\bar{r}$)

Let us consider now a fiscal expansion by the state (increasing government purchases or by cutting taxes) with money, price, rate of interest given in a state .Then equilibrium fiscal expansion shifts the IS curve to the right, putting upward pressure on the market exchange rate.

11

But because the reserve bank stands ready to trade foreign and domestic currency at the fixed exchange rate, arbitrageurs quickly respond to the raising exchange rate by selling foreign currency to the reserve bank, leading to an automatic monetary expansion. The rise in the money supply shifts the LM curve to the right. It implies that fiscal expansion raises income.
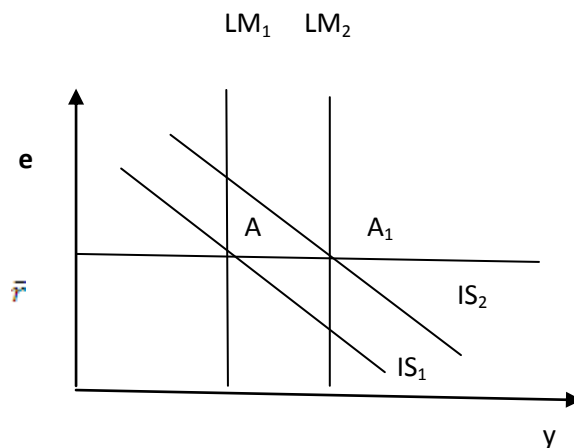

Figure I: Income, exchange rate and rate of interest in the IS-LM framework

A fiscal expansion shifts the IS curve to the right (IS_1 to IS_2).To maintain the fixed exchange rate the RBI must increase the money supply ,thereby shifting the LM curve to the right(LM_1 to LM_2) and raises the income.

Section IV

Implication of Reforms on some vital areas among major Indian States

How did the richer Indian states, which did better performance in industrial uplift, execute their reform measures which did help the boon of such industrialization during reform period? This paper also points out to some of the vital areas of such implications:

1. **Strikes and Lockouts**:

One of the significant factors regarding the industrial setback for West Bengal state is strike and lockouts which almost appear owing to the positive incentive of West Bengal left front government. Table 4 shows the statement of man days lost due to industrial disputes (strikes and lockouts) which did face the high incidence of man-days lost due to strikes and lock-outs during 1979-2008 among major Indian states .As may be seen in table 4 ,for a single year in 2005,about 3 crores (2,74,65,318) man days were lost for strikes and lockouts. West Bengal alone shares approximately 68.94 per cent man days lost out of all man days in India during 2005.If one compares the figure before economic reform and during economic reform period during the regime of present left front government one may find that in 1979,West Bengal alone shared 41.22 per cent of total man days lost in India due to strikes and lock outs. Interestingly, the states having higher incidence of man days lost due to strikes and lock outs except West Bengal account for 35.92 per cent approximately if the figures of 8 states are combined together in 1979.Worthwhile to mention that in 1979,the industrial performance of all Indian states except Maharastra and Tamil Nadu was much worse than that of West Bengal state. Also important is that during ten years period(1979-1989) before economic reform the proportion of man days lost for strikes and lock outs were more or less same in West Bengal state, the share of West Bengal being 41.18 percent of total , where for the rest the combined figure works at to 48.7 per cent of total approximately. What it implies is that during pre-reform period from 1979 to 1989 the combined figure of man days lost for 8 major Indian states was more or less nearer to the figure of West Bengal state alone. But interestingly, the data during 1989-2005 shows that 8 major Indian states register two fundamental changes in industrial performance (1) all these made higher industrial progress in relation to West Bengal.(Table 1).(2) The politics of man days lost due to strikes and lockouts almost came to an end in all these states, because the

13

combined man days lost to all these states except West Bengal is approximately 10.45 per cent of total man days lost of India in 2005, whereas in 1989,a period of 16years back , their combined contribution was 35.92 per cent approximately. But in 2005 the man days lost in West Bengal alone register 68.94 percent approximately of total man days lost in India (more than two third man days lost in Indian states). Although the incidence of man days lost in West Bengal due to strikes and lock outs has decreased to some extent during the current period , the very recent figure(2008) shows that West Bengal still register about 42 per cent of total man days lost(more than two fifth of total man days lost)in India, whereas the figures of man days lost due to strikes and lock outs is negligible during the same year for those states which made higher progress in industrial scene than West Bengal during reform period . These results ,however ,reveal that during the reform period the man days lost for lock outs and strikes significantly increases in West Bengal ,whereas they decreases substantially in those states which made higher progress in industrial scene than West Bengal during reform period. The state of West Bengal ,among others, did fail to have the fruits of industrial progress because of the fact that(one of the most significant reasons) the government of West Bengal did not execute her reform policy in minimizing industrial dispute from strikes and lock-outs :rather she did execute her positive role in augmenting the same .

Table 4: Figure of Strikes and Lock-Outs in some major States of India:

States	1979	1989	2005	2006	2007	2008
Andhra Pradesh	1.51	16.59	2.49	6.05	.61	.54
Gujarat	1.24	1.42	0.42	.4	.17	.11

Haryana	1.96	2.09	1.79	1.04	.08	.07
Karnataka	2.16	0.97	1.17	.72	.17	.22
Maharastra	6.79	14.95	1.78	1.2	2.1	1.5
Punjab	0.17	1.90	0.10	.51	.58	.2
Tamil Nadu	19.17	9.69	2.38	2.22	3.2	2.1
Uttar Pradesh	2.92	1.09	0.32	1.4	1.2	.78
West Bengal	41.22	41.18	68.94	41.45	42.50	42

Source: Labour Bureau (Simla): *labourbureau*.nic.in ,indiastat.com.

2. **Foreign Direct Investment**:

   Foreign Direct Investment is one of the significant factors for industrialization .The Indian states which attracted higher foreign direct investment could do it mainly because of positive role of reforms by state governments.

   None but five Indian states namely Gujrat, Karnataka, Maharastra, A.P. and TamilNadu have higher incidence of foreign direct investment during reform period.(Table 5) If one examines state wise data regarding the performance of foreign direct investment during reform period ,one may have some important features.

   With regard to per capita FDI is concerned (Table 5) seven Indian states –Haryana,Himachal Pradesh,Karnataka,Maharastra,Tamil Nadu,Gujarat,Andhra Pradesh-have higher incidence of per capita FDI during the reform period from 1991to2003. It implies that all high income and

middle income group of states except Punjab, which belongs to high income group ,and Kerala and West Bengal ,which belong to middle income group of states, under major Indian states belonging to general category have higher incidence of FDI during reform period. Importantly, despite the fact that Punjab had lower FDI during reform period, their internal flow of productive capital was much stronger than West Bengal and Kerala .The failure of West Bengal and Kerala in attracting FDI due to their anti-imperialist role against FDI by the left front government in those two states indicating a negative role of fiscal policies by the latter. The very recent data (2009-10) of Table 6 also show that major cities of those seven Indian states including the capital of Punjab did retain their predominance of FDI among Indian states. These figures however support the study of OECD(2007) which points out ' with relatively more liberal states receiving virtually all of India's FDI flows'(p.93).

Table 5: State-wise Break up of Amount of FDI Approved by Government   (During August 1991 to December 2003)

States	Amt. of FDI Approved(1991-2003)	%Share of Total	Per Capita FDI(Rs.)1991-2003(average)
A.P.	134025.61	4.61	136.94
Assam	14.95	0	0.05
Bihar	8842.20	.3	6.79
Gujarat	188184.47	6.47	303.02
Haryana	38634.11	1.33	153.27
H.P.	11740.17	.4	154.48
Karnataka	239969.98	8.25	360.75
Kerala	15457.91	0.53	37.76

M.P.	99041.29	3.41	99.69
Maharastra	507121.41	17.44	424.37
Orissa	82239.13	2.83	65.85
Punjab	24226.50	0.83	82.53
Rajasthan	30072.42	1.03	44.92
TamilNadu	248104.83	8.53	312.72
U.P.	50401.78	1.73	24.19
W.B.	92606.18	3.18	93.70

Source: SIA. Newsletter Annual Issue 2000 and 2002 and SIA Monthly Newsletters from January

to December 2003.

Table 6: RBI Regional Office-wise Foreign Direct Investment

(FDI) Inflows Received (with state covered) in India (2000-10)

Cities	2000-05	2009-10
Mumbai	**18.8**	**32.01**
New Delhi	**23.11**	**37.52**
Bangalore	**6.75**	**3.94**
Ahmedabad	**2.9**	**3.15**
Chennai	**5.4**	**2.97**
Hyderabad	**2.86**	**4.64**

Kolkata	**1.30**	**0.43**
Chandigarh	**1.55**	**0.84**
Panaji	**.51**	**0.66**
Jaipur	**.01**	**0.12**
Kochi	**.31**	**0.49**
Bhubaneswar	**.27**	**0.57**
Bhopal	**.17**	**0.21**
Guwahati	**.04**	**0.04**

Source: Ministry of Commerce & Industry, Government of India.

3.   Electrification:

Low per capita consumption of power is also one of the vital factors in some major Indian states (namely Assam, Bihar, Kerala, Orissa, U.P. and West Bengal)for lower incidence of industrialization(Table 7).This is almost due to the lack of reform policies (economic and administrative)for state governments in almost all these states. It is said that to build up physical infrastructure like electricity, both FDI and internal private investments need fiscal reforms by the state governments to attract those investments within those states. However those states failed to execute such reform measures in attracting those investments.

Availability of higher incidence of physical infrastructure like electricity is also a pre-requisite for higher incidence of industrialization. Poor physical infrastructure of electricity is a reflection

of poor investment climate which fails to improve state's comparative advantage for industrialization.

Table 7:   State wise Per Capita Consumption of Power (in K.W.)

States	Per Capita Consumption of Power			
	1991	2003	2007-2008	2009-2010
A.P.	245.22	672.6	812.2	900.5
Assam	93.53	160	165.6	175.6
Bihar	110.07	274.6	195.7	220.2
Gujarat	469.33	1192.9	1138.6	1300.5
Haryana	400.4	997.1	1216.7	1298.5
H.P.	208.91	598.7	956.6	1012.2
Karnataka	295.99	611.2	743.9	789.6
Kerala	186.45	377.5	480	502.3
M.P.	247.38	598.1	591.2	625.3
Maharastra	410.87	848	969.9	998.7
Orissa	270.72	470.2	503.9	520.1
Punjab	605.81	1227.4	1597.2	1698.2
Rajasthan	201.48	566.1	630.3	685.2
Tamil Nadu	323.03	815.3	1029.6	1121.8
U.P.	165.85	389.9	343.4	350.2
W.B.	146.18	366.5	347.8	387.6

Source: CMIE Infrastructure

4. **Telephone**:

States having higher incidence of industrial units have higher infrastructure of telephone during reform period (Table 8)[3]. Kerala is an exception in this regard. Despite being lower incidence of industrialization during reform period, the number of telephone per 100 person has significantly increased during reform period. The establishment of physical infrastructure like telephone also depends on state reform policies. Obviously, states registering higher incidence of industrial units executed more favorable policies which help to augment the infrastructure of telephone and so they gain the fruits of industrialization.

Table 8: Telephones per 100 persons among Indian States (during 1991-2003) under BSNL service

States	Telephones per 100 persons			
	1991	2003	2007	2009
A.P.	0.48	7.85	7.2	7.58
Assam	0.17	2.13	4.12	4.74
Bihar	0.11	1.84	3.5	3.97
Gujarat	1.05	10.14	6.5	8.22
Haryana	0.57	8.38	11.2	12.54
H.P.	0.57	10.14	20.7	23.32

Karnataka	0.68	9.46	8.8	9.5
Kerala	0.8	14.87	18.9	21.14
M.P.	0.26	2.81	4.2	5.17
Maharastra	1.26	8	7.7	7.94
Orissa	0.19	2.95	5.6	6.96
Punjab	0.95	17.33	14.5	16.54
Rajasthan	0.32	4.5	7.5	7.8
Tamil Nadu	0.78	8.54	9.58	10.82
U.P.	0.21	4.03	6.1	6.12
W.B.	0.46	2.18	3.91	4.1

Source: CMIE Infrastructure.

Section V

Conclusions:

This study lends credence to the fact that the richer states have higher industrial growth during the post-reform period than the poorer ones due to, mainly, higher performance of manufacturing industries at state-level both quantitatively and qualitatively. What are the significant reasons as to why the poorer states loose in gaining industrial boon in relation to the richer ones during economic reform period? The study, however, suggests that Indian states

which could contribute to higher economic and administrative reforms by various measures during economic reform period did gain the boon of industrial achievements. One may argue that already existing better infrastructure that prevailed before reforms is the most significant reasons for the industrial achievements of richer Indian states. As is well known, West Bengal is one of the middle income states like TN, Kerala, and Karnataka; but before 1980, for infrastructural development she tops almost all Indian states. West Bengal registered second major industrial states in terms of net value added and number of workers employed and third in terms of number of factories. But the industrial performance of West Bengal has been stepped down to the 8th position among Indian states during economic reform period. The fact is that the states which registered better industrial performance during reform period mainly due to higher fiscal reform did also register better infrastructural uplift during reform period. OECD(2007) report also argue, "to begin with the process of closing the gaps in economic performance across states , the relatively restrictive states need to improve their regulatory environment so as to become more competitive and productive"(p.94). So, the fiscal reforms of a state introduced by various economic and administrative reforms must help raising the income level of the particular state reflecting thereby to develop her economy which might gain the fruit of industrial development.

Notes

 1.   profit efficiency analysis: In econometric applications one specifies some explicit form of the production, cost, or profit function to represent the benchmark technology for efficiency measurement. The maximum profit is the profit function underlying what may be considered as the best practice techniques utilized by a given group of firms. The interest of the sample firms

(here, major Indian States) is focused on ascertaining the highest profit using the best practice technique at the firm level given the level of technology and the feasibility of input-output bundle chosen. We use the following method to analysis profit efficiency using DEA.

In econometric applications one specifies some explicit form of the production, cost, or profit function to represent bench-mark technology for efficiency measurement. We also measure the profit efficiency of major Indian states based on three financial performance indicators (labour cost and productive capital on net value added). The procedure of its measure is as follow:

The method of data envelopment analysis introduced by Charnes et.al. (1978) and further extended to non-constant returns technologies by Banker, Charnes and Cooper (BCC) (1984) and Charnes et.al.(1985)provides a way to construct the production possibility set from an observed data set of input-output bundles.

Suppose that (X^j ,Y^j) is the input-output bundle observed for firm j (j=1,2,........,N). Clearly, these input-output bundles are all feasible. Then the smallest production possibility set satisfying the assumption of convexity and free disposability that includes these observed bundles is

S= {(X,Y):X ≥ $\sum_{j=1}^{N} \lambda_j X^j$; Y≤ $\sum_{j=1}^{N} \lambda_j Y^j$; $\sum_{j=1}^{N} \lambda_j = 1$; $\lambda_j ≥ 0$; (j= 1,2,........N)}

The set S is also known as the free disposal convex hull of the observed input-output bundles. One can obtain various measures of efficiency of a firm using the set S as the reference technology.

For a commercial firm, both inputs and outputs will be choice variables and the only constraint would be the feasibility of the input-output bundle chosen. For such a firm, criterion of efficiency is profit maximization. At input and output prices w and p, respectively, the actual profit of the firm producing the output bundle Y^o from the input bundle X^o is $\prod^o = p^{/} Y^o - w^{/} X^o$. The maximum profit feasible for the firm is:

$\prod(w,p) = \max p^{/} Y - w^{/} X : (X,Y) \in T.$

In any empirical application, the maximum profit may be obtained as

$\prod* = \max p^{/} Y - w^{/} X$ s.t.

$$\sum_{j=1}^{N} \lambda_j Y^j \geq Y \; ; \; \sum_{j=1}^{N} \lambda_j X^j \leq X; \; \sum_{j=1}^{N} \lambda_j \geq 0 \qquad ; (\; j = 1,2,.......N)\}$$

The profit efficiency of the firm is measured as $\delta = \prod^{\circ} / \prod*$. This measure is also bounded between 0 and 1 except in case where the actual profit is negative, while the maximum profit is positive. In that case δ is less than 0. If the maximum profit is negative as well, δ exceeds unity (Das et al, 2005).

2. The important findings of Economic Surveys by OECD (2007) on major Indian states are:

i) With relatively more liberal states receiving virtually all of India's FDI flows (p.93).

ii) Excessive administrative burden are associated with lower share of private sector employment in the formal sector: firms in the relatively restrictive states prefer to remain small and informal so as to avoid government administrative requirements (p.93).

iii) States in which regulation of product is more conducive to competition have been far more

 successful at infrastructure provision than the relatively restrictive states (p.197-98).

3) We have considered here the telephone service under BSNL, because the telecommunication service other than BSNL is a very recent phenomenon (2002-03 onwards).

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24

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