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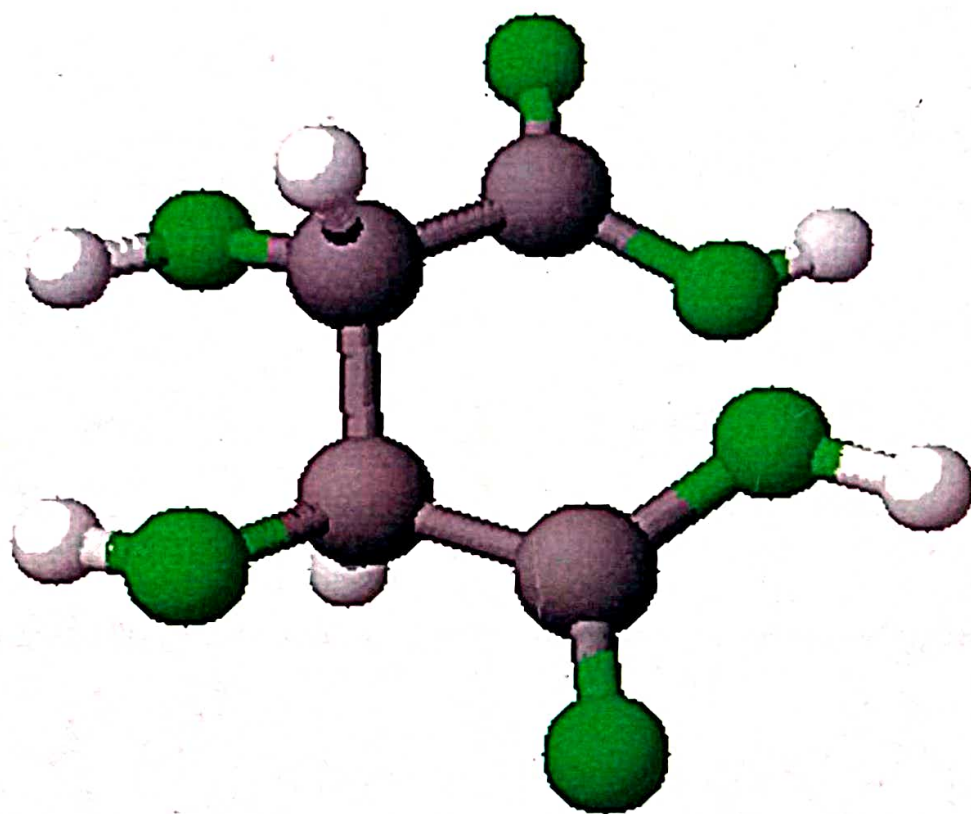
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Dr. Safiqur Rahman

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Contents

An Econometric Investigation Into Variation of Industrial Growth Across Indian States in 2017-18

Homang Chetri

Abstract : This Paper focuses on the magnitude of the factors that are affecting industrial growth across Indian state. Industrial sector is of great importance for economic development of the country. It is a historical fact that countries with strong industrial sector have showed more economic growth and development which have also improved national income and promoted living standard of population. India's industrial growth is not satisfactory as compared to other countries. Thus, we have to investigate the main factors which are mainly impact on industrial growth. To investigate the variations, multiple linear regression model and Non linear regression model have been used and to perform the statistical analysis Statistical Software SPSS 16.00 is used.

Key words: industrial growth, balanced regional development, Indian states

1. Introduction:

Governance in India is a federal system of governance with both the state and the Central governments responsible for the development of the nation as a whole. Policies of the Central as well as state governments impact the state level variations in economic conditions in turn. Balanced regional development has been a "touch-stone" for policy making in India in a number of instances (Chelliah, 1996). Industrial sector is of great importance for economic development of the country. It is a historical fact that countries with strong industrial sector have showed more economic growth and development which have also improved national income and promoted living standard of population. But in India, industrial growth is not satisfactory as compared to other countries. Moreover regional imbalance of industrial growth is more acute in India. Along with regional imbalance, there are some other factors such as length of road, governance, state location etc which has impact on industrial growth and these are the major concern for the government in policy measure. Thus, we have to investigate the main factors which are mainly impact on industrial growth.

2. Objectives:

In this study, the main objective is to find out the magnitude of the factors that are affecting industrial growth across Indian state.

3. Methodology:

The data are collected from the secondary sources, specifically RBI Handbook of Statistics on Indian States 2000-01 to 2017-18.

In order to obtain the desire result the linear regression model has been used. The total 28 Indian states have been considered for the study. The Union Territories of India other than Telangana have been excluded from the study. To perform the statistical analysis Statistical Software SPSS 16.00 is used.

4. Results and Discussion

4.1 Multiple linear regression model specification, descriptive statistics hypothesis formation:

To explain the variation of industrial growth across Indian states, several factors like contribution of manufacturing, length of roads, literacy rate, governance and state location(dummy variable) are

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considered and the following multiple linear regression model has been formulated-

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 D_i + U_i$$

Where,

Dependent variable: Y_i= Industrial growth as proportion to state GSDP in 2017-18

Independent variable:

X_{1i} = Contribution of manufacturing to state GSDP (industry) of ith state

X_{2i} = Length of Roads (kms) of ith State

X_{3i} = Literacy rate of ith state as per 2011 census data

X_{4i} = Governance index of ith state

D_i = State location (dummy variable) of ith state

0= coastal, 1= Non Coastal

i = No. of states (=1,2,3,4............,28), U = Error term

Coefficient:

β_0 = mean, β_1= coefficient of contribution of manufacturing of ith state

β_2 = coefficient of length of roads (kms) of ith state

β_3 = coefficient of literacy rate of ith state

β_4 = coefficient of Governance index of ith state

β_5 = coefficient of state location of ith state

Table1: Description of variables

Variable's Name	Variable symbols	Descriptive statistics			Expected sign of the coefficient
		Mean	Median	S.D	
Industrial growth	Y_i	2954251.25	2353399	3372556.304	
Contribution of manufacturing	X1	1666716.96	907955	2389561.746	
Road	X2	104498.54	59406	95700.930	
Literacy rate	X3	67.1174	67.25	10.122	
Governance Index	X4	32.55	30.34	23.725	
State location	D	.32	0.00	0.476	(-)

The mean, median and standard deviation of the variables are tabulated in the table1. The expected sign of the coefficient are positive except state location.

With SPSS software the following result has been found:

Table2: Results of Regression Analysis (Impact on industrial growth):

Variables/constant	Estimated coefficient	Standard error	t value	Significance level
β_0	-283546	603746.33	-0.470	.643
X_1	1.254 ***	0.39	32.13	.000
X_2	4.327***	1.129	3.832	.001
X_3	5622.943	8418.535	0.668	.511
X_4	11190.058**	4156.570	2.692	.013
D	-142533.017	224526.796	-0.635	.532
R^2	.99			
F-statistic (5, 22)	453.876			0.000

Note: ***, ** and * indicates level of significance at 1%, 5% 10% respectively.

In this table, Results of the multiple regression model are tabulated. The R^2 value is .99 which means that our independent variables explain 99% of the variation in endogenous variable i.e industrial growth. It means the model give a best good fit. F value indicated overall significance of the fitted model. Here its value is 452.872 which is significant at 0.01 percent. The coefficient of the explanatory variables such as contribution of manufacturing and length of road are 1.254 and 4.327 respectively which are significant at 1% level of significance. The estimated coefficient of governance index is 11190.058 which is also significant at 5% level of significance. The other two explanatory variables i.e literacy rate and state location (D) are not significant which implies these two factors are not significantly impact on industrial growth in Indian states.

4.2 Non linear regression model analysis:

To explain the variation of industrial growth across Indian states, several factors like contribution of manufacturing, length of roads, literacy rate, governance index and state location(dummy variable) are considered and the following Non linear regression model has been formulated-

$$Y_i = \beta_0 \, M^{\beta_1} R^{\beta_2} L^{\beta_3} G^{\beta_4} e^{D1} e^{Ui}$$

$$\text{Or } \log Y_i = \log \beta_0 + \beta_1 \log M + \beta_2 \log R + \beta_3 \log L + \beta_4 \log G + \beta_5 \log D + Ui$$

Where, $\log M$ = Contribution of manufacturing to state GSDP (industry) of ith state

$\log R$ = Length of Roads (kms) of ith State

$\log L$ = Literacy rate of ith state as per 2011 census data

$\log G$ = Governance index of ith state

$\log D$ = State location (dummy variable) of ith state

where, 0 = coastal, 1 = non coastal, U = Error term

i = no. of states (1,2,3,4,.........................,28)

β_0 = constant, β_1, β_2, β_3, β_4, and β_5 are the respective explanatory variable's coefficient.

Table3: Description of variables

Variable's Name	Variable symbols	Descriptive statistics			Expected sign of the coefficient
		Mean	Median	S.D	
Industrial growth	Yi	6.10154	6.3670	.697374	
Contribution of manufacturing	X1	5.63018	5.93700	1.007	
Road	X2	4.73457	4.76300	.590627	
Literacy rate	X3	1.82161	1.82700	.06499	
Governance	X4	1.32182	1.47200	0.488314	
State location	D	.70	1.00	0.405	(-)

The mean, median and standard deviation of the variables are tabulated in the table3. The expected sign of the coefficient are positive except state location.

With SPSS software the following result has been found:

Table4: Results of Non Regression Analysis (Impact on industrial growth):

Variables/constant	Estimated coefficient	Standard error	t value	Significance level
β_0	1.842**	.761	2.422	.024
X_1	.599 ***	0.049	12.262	.000
X_2	.150**	0.055	2.754	.012
X_3	.085	.340	0.250	.805
X_4	.26	.084	.310	.760
D	-.023	0.053	-0.440	.664
R^2	.98			
F-statistic (5, 22)	274.167			0.000

Note: ***, ** and * indicates level of significance at 1%, 5% 10% respectively.

In this table, Results of the multiple regression model are tabulated. The R^2 value is .98 which means that our independent variables explain 98% of the variation in endogenous variable i.e industrial growth. It means the model give a very good fit. F value indicated overall significance of the fitted model. Here its value is 274.167 which is significant at 0.01 percent. The constant (β_0) is 1.842 which is significant at 5% level of significance which implies we have excluded some important explanatory variables in the model.

The coefficients of contribution of manufacturing and length of road are .599 and .150 which are significant at 1% and 5% level of significance respectively. The other explanatory variables i.e literacy rate, governance and state location (D) are not significant which implies these three factors are not significantly impact on industrial growth in Indian states.

Conclusion:

1. Conclusion

It is quite clear that states have performed differently from each other in terms of growth of manufacturing industries and changes in their structure. Reduction of regional disparities has always been a national objective since the strength of a building depends on the strength of its weakest pillar. Present study provides an exploratory analysis of variations in industrial growth across the states and analyse the patterns in state level government expenditures to understand how they are aligned with the objectives of balanced regional development within the national economy. The study attempts to assess the patterns of state level variations in industrial growth using some basic factors of development. Though the specific objective of keeping the variations in industrial growth factors from widening has been achieved with respect to some industrial growth factors, there has been a growing concern that the less developed states continue to lag behind the developed states and that this cleft is increasing. The policy concern is explicit in the planning process (2007-08 to 2018-19), where inclusive growth has been given priority.

It can be concluded from the above analysis that the government should take initiatives for economic reforms by giving importance to the factors that has impacted on industrial growth in India.

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