



**AN ECONOMETRIC INVESTIGATION INTO VARIATION OF  
NET STATE DOMESTIC PRODUCT GROWTH RATE ACROSS INDIAN  
STATES IN 2017-18**

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**Abstract:**

This paper attempts to understand the regional dimensions of economic growth in India. The goal of equitable economic development is to enable income levels of poorer states to reach the levels of the richer states. For this, the incomes of poorer states must grow faster than those of the rich for a long time. Inter-state disparities in income levels and growth rates as measured by the coefficient of variation increased over time. If a state sustains high growth in labour-intensive sectors, it is likely to be more successful in creating jobs.

**Keywords:** *Net State Domestic Product Growth Rate, Economic Growth, Indian State.*

**2.1: INTRODUCTION:**

This paper attempts to understand the regional dimensions of economic growth in India. Understanding the causes and nature of differences in levels and growth of income across the regions (countries) is very important because even small differences in the growth rates, if cumulated over a long period of time, may have substantial impact on the standards of living of people [Barro and Sala-i-Martin, 1995]. Further, inequality in any respect gives rise to unequivocal negative effects on subsequent growth and development, and worsens economic, social, and political tension among regions leading to misallocation of resources (Chowdhury, 2003).

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India's GDP growth rate which has been covering around 3.5 per cent is termed as 'Hindu Growth Rate' shifted to above 5 per cent in the 1980's even before the introduction of reforms in the country. The growth rate which has shifted to 8 per cent in recent times has raised several issues. The first issue is about the sustainability of this high rate of growth. The second issue is about the inherent instability in the growth process and to find ways to reduce this instability. The third issue is to reduce the inter-state disparities and also be in the higher growth process. The other issue is to reduce the disparities at the regional level within the state. India in order to sustain its higher growth rate, the major bottlenecks has to be addressed in a phased manner. These are infrastructure, slowdown of agriculture growth, poverty and inequality, financial regulations and corruption free governance.

## 2.2: OBJECTIVE:

The main objective of this study is to find out the magnitude of the factors that are affecting NSDP growth rate across Indian state.

## 2.3: METHODOLOGY:

The data are collected from the secondary sources, mainly NITI Ayog, RBI Handbook of Statistics on Indian States 2000-01 to 2017-2018, Basic Road Statistics of India. In order to obtain the desire result the linear regression model has been used. The total 12 Indian states have been considered for the study. To perform the statistical analysis Statistical Software SPSS16.00 is used.

## 2.4: RESULTS AND DISCUSSIONS:

To explain the variation of NSDP Growth rate across Indian States, several factors like NSDP per capita, percentage of manufacturing in NSDP, Roads per 1000 square km, percentage of agriculture in NSDP, Literacy rate and location of states (Mountainous Dummy variable) are considered and the following two model have been formulated-

### 1. Multiple Linear Regression Model:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 D_i + U_i$$

Where,

Dependent variable:  $Y_i$  = Net State Domestic Product Growth rate (current Price) of  $i^{\text{th}}$  state in 2017-18.



Independent variable:  $X_{1i}$  = Net State Domestic Product Per Capita current price) of  $i^{th}$  state

$X_{2i}$  = Percentage of manufacturing in NSDP of  $i^{th}$  state

$X_{3i}$  = Roads per 1000 square km of  $i^{th}$  state

$X_{4i}$  = Percentage of Agriculture in NSDP of  $i^{th}$  state

$X_{5i}$  = Literacy rate of  $i^{th}$  state

$D_i$  = Location of states (Dummy variable) of  $i^{th}$  state

0 = Mountainous State

1 = Others

$i$  = No. of state (=1,2,3,.....,12)

$U$  = Error term

Coefficient:  $\beta_0$  = mean

$\beta_1$  = Coefficient of NSDP Per Capita of  $i^{th}$  state

$\beta_2$  = Coefficient of percentage of manufacturing in NSDP of  $i^{th}$  state

$\beta_3$  = Coefficient of roads per 1000 square km of  $i^{th}$  state

$\beta_4$  = Coefficient of percentage of Agriculture in NSDP of  $i^{th}$  state

$\beta_5$  = Coefficient of literacy rate of  $i^{th}$  state

$\beta_6$  = Coefficient of state location of  $i^{th}$  state

**Table1:** Description of variables

Variable's name	Variable symbols	Descriptive statistics			Expected sign of the coefficient
		Mean	Median	S.D	
NSDP Growth	$Y_i$	7.91	7.98	2.25	
NSDP Per Capita	$X_1$	39767	37708	15483.7	
Manufacturing in NSDP	$X_2$	17.87	18.03	10.65	
Road	$X_3$	38.93	35.6	14.80	
Agriculture in NSDP	$X_4$	15.34	16.33	5.02	
Literacy	$X_5$	70.65	69.14	10.67	
State location	$D$	0.68	1	0.48	



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 we got the following result:

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

Variables/constant	Estimated coefficient	Standard error	t value	Significance level
$\beta_0$	8.696**	4.161	2.09	.059
X <sub>1</sub>	-1.998	.000	-.501	.625
X <sub>2</sub>	.091**	.035	2.586	.024
X <sub>3</sub>	-.016	.029	-.575	.576
X <sub>4</sub>	-.296**	.114	-2.590	.024
X <sub>5</sub>	.044	.037	1.188	.258
D	.701	.804	.872	.400
R <sup>2</sup>	.744			
F-statistic (6, 19)	453.876			0.000

Source: Econometrics Analysis

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

In this table, Results of the multiple regression model are tabulated. The R<sup>2</sup> value is .744 which means that our independent variables explain 74.4% of the variation in endogenous variable i.e NSDP growth rate. It means the model give a good fit. F value indicated overall significance of the fitted model. Here its value is 5.827 which is significant at 0.005 percent. The coefficient of the explanatory variables such as percentage of manufacturing and percentage of agriculture are .431 and -.660 respectively which are significant at 5% level of significance. The other explanatory variables i.e NSDP PC, Roads, literacy rate , state location (D) are not significant which implies these factors are not significantly impact on NSDP growth rate in Indian states.

## 2. Non linear regression or Log linear regression:

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



$$Y_i = \beta_0 P^{\beta_1} M^{\beta_2} R^{\beta_3} A^{\beta_4} L^{\beta_5} e^{\beta_6 D_i} e^{U_i}$$

Or  $\log Y_i = \log \beta_0 + \beta_1 \log P + \beta_2 \log M + \beta_3 \log R + \beta_4 \log A + \beta_5 \log L + \beta_6 \log D_i + U_i$

Where,  $\log P$  = NSDP Per Capita of  $i^{th}$  state

$\log M$  = Percentage of manufacturing in NSDP of  $i^{th}$  State

$\log R$  = Roads per 1000 square km of  $i^{th}$  state

$\log A$  = Percentage of agriculture in NSDP of  $i^{th}$  state

$\log L$  = Literacy rate of  $i^{th}$  state

$\log D$  = State location (dummy variable) of  $i^{th}$  state

where, 0 = Mountainous state, 1 = non mountainous,  $U$  = Error term

$i$  = no. of states (1,2,3,4,.....,19)

$\beta_0$  = constant and  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  and  $B_6$  are the respective explanatory variable's coefficient.

**Table 3:** Description of variables

Variable's Name	Variable symbols	Descriptive statistics			Expected sign of the coefficient
		Mean	Median	S.D	
NSDP Growth Rate	Yi	0.88	0.90	0.13	
NSDP Per pita	X1	4.57	4.58	0.18	
Percentage of Manufacturing in NSDP	X2	1.14	1.26	0.40	
Roads	X3	1.56	1.55	0.19	
Percentage of Agriculture in NSDP	X4	1.15	1.21	0.16	
Literacy rate	X5	1.84	1.83	0.07	
State location	D	0.684211	1	0.48	

The mean, median and standard deviation of the variables are tabulated in the table 3. The expected sign of the coefficient are positive except state location.

With SPSS software we got the following result:

**Table 4:** Results of Non Regression Analysis (Impact on NSDP growth rate):

Variables/constant	Estimated coefficient	Standard error	t value	Significance level
$\beta_0$	.798	.990	.806	.436
$X_1$	-.082	.156	-.523	.610
$X_2$	.132***	.045	2.909	.01
$X_3$	-.027	.106	-.258	.801
$X_4$	-.590***	.167	-3.544	.004
$X_5$	.542*	.289	1.874	.085
D	.049	.040	1.240	.239
$R^2$	.773			
F-statistic (6, 19)	6.826			0.002

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

In this table, Results of the log linear regression model are tabulated. The  $R^2$  value is .773 which means that our independent variables explain 77.3% of the variation in endogenous variable i.e NSDP Growth rate. It means the model give a good fit. F value indicated overall significance of the fitted model. Here its value is 6.826 which is significant at 0.01 percent. The constant ( $\beta_0$ ) is .798.

The coefficients of Percentage of Manufacturing in NSDP, Percentage of Agriculture in NSDP and Literacy rate are .408, -.745 and .278 which are significant at 1%, 1% and 10% level of significance respectively. The other explanatory variables i.e NSDP Per capita , Roads and state location (D) are not significant which implies these three factors are not significantly impact on NSDP Growth rate in Indian states.

## 2.5: CONCLUSION:

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 impact on NSDP Per capita in India. Growth in the different states in India during 1990-2018 was characterised by instability and volatility. The degree of volatility was very high in some states. It would be instructive to extend the analysis to sectoral growth rates and identify the sectors contributing to volatility and instability. Inter-state disparities in income levels and growth rates as



measured by the coefficient of variation increased over time. However, the relative positions of many states remained unchanged.

#### **REFERENCES:**

RBI: Handbook of statistics on Indian states. Retrieved from <https://rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20States>.

Ahluwalia. M.S. (2000). Economic Performance of States in Post Reforms Period. Economic and Political Weekly. May 6. pp. 1637-1648.

Anerjee. A.; P. Bardhan; K. Basu; M. Datta. Chaudhuri; M. Ghatak; A.S. Guha; M. Majumdar; D. Mookherjee and D. Ray (2000). Strategy for Economic Reform in West Bengal. Economic and Political Weekly. October 12-18. pp. 4203-4218.

Dasgupta. D; P. Maiti; R. Mukherjee; S. Sarkar and S. Chakrabarti. (2000). Growth and Interstate Disparities in India. Economic and Political Weekly. July 1. pp. 2413- 2422.

Dholakia. B.H. (2002). Sources of India's Accelerated Growth and the Vision of the Indian Economy. Indian Economic Journal. Vol. 49. No.4. pp. 27-46.

Dholakia. R. H. (1994). Spatial Dimension of Acceleration of Economic Growth in India. Economic and Political Weekly. August 27. pp. 2303-2309.

Rao. M.; Govinda. R. T.; Shand and K. P. Kalirajan. (1999). Convergence of Incomes Across Indian States: A Divergent View. Economic and Political Weekly. March 27. pp. 769-778.