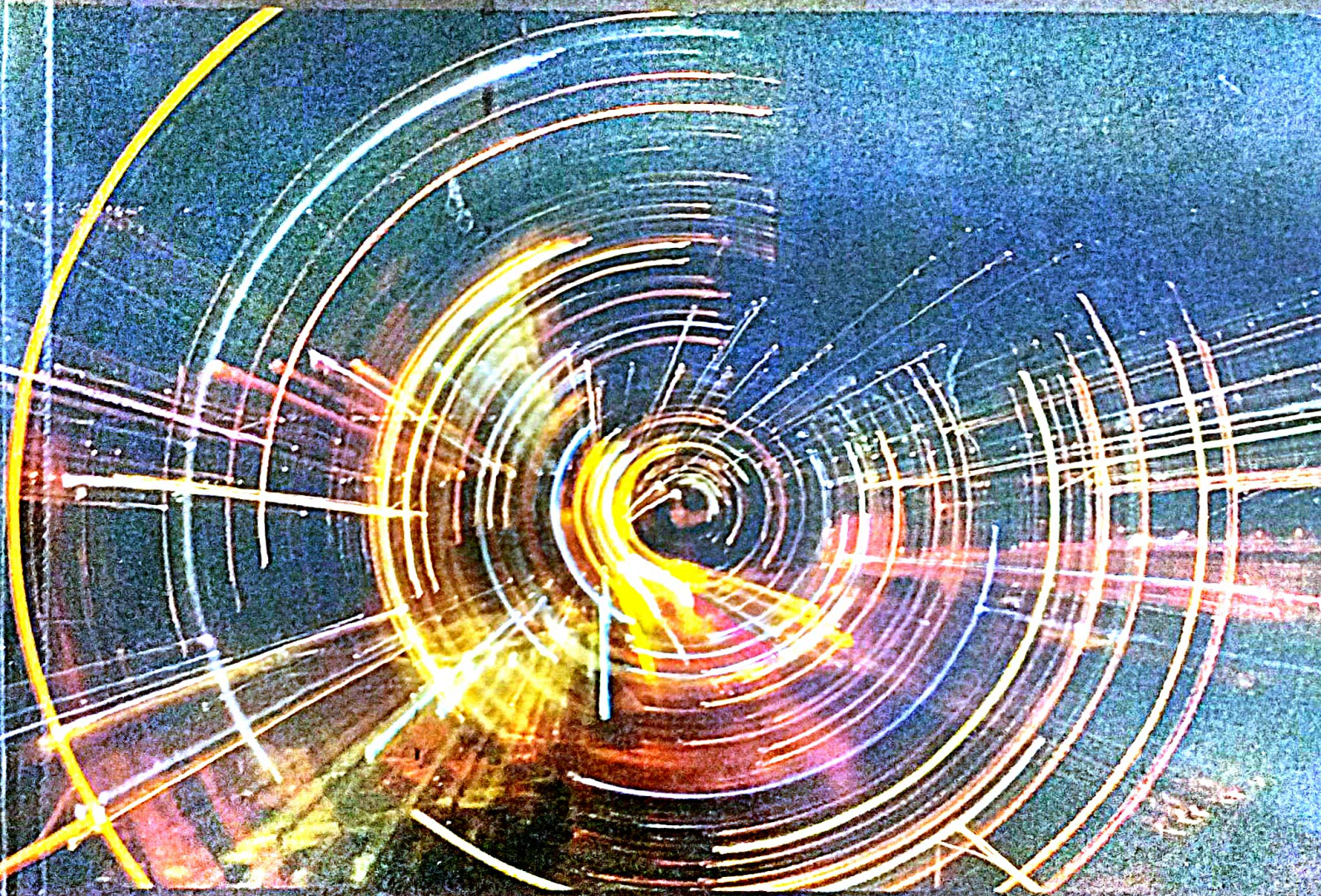


Illumine

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**Edited by
Dr. Safiqur Rahman**



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❖ Status of Women and Their Economic Empowerment : Special Reference to Women in Assam	<i>Papari Deka</i>	84
❖ Representation of the Dynamics of Culture in Literature : Reading America of the Progressive Period in Edgar Lawrence Doctorow's Novel Ragtime	<i>Nabanita Hazarika</i>	89
❖ Gender Discrimination and Food in Easterine Kire's A Terrible Matriarchy	<i>Priyanka Roy</i>	96
❖ Marketing of Library Products and Services in Recent Time : A Theoretical Approach	<i>Geetali Das</i>	102
❖ Skilled Migration And Its Consequences : A Case Study in Guwahati	Dr. Upasana Chakravarty	
	Rupali Talukdar	106
❖ Dynamics of Communication Skills	<i>Sarifuddin Aliahmed</i>	114
❖ The Sankhya Theory of Evolution	<i>Rupmala Hojai</i>	118
❖ Socio-Economic Condition of Tea Garden Labourers in Assam : A Case Study of Koilamari and Dejoo Tea Estate in Lakhimpur District, Assam	<i>Bonti Hazarika</i>	122
❖ The Role of Female Education in Controlling Population Growth : An Empirical Analysis in Assam	<i>Saurabh Pran Sharma</i>	
	<i>Anamika Sarma</i>	134
❖ The Sanctity of Life	<i>Biren Borah</i>	141
❖ An Econometric Investigation Into Variation of Net Statedomestic Product Growth Rate Across Indian States in 2017-18	<i>Homang Chetri</i>	145
❖ Immigration and Socio Economic Consequences in Assam	<i>Jyotirmayee Devi</i>	151
❖ Women in The Colonial Tea Gardens of Assam	<i>Kirtana Bardalai</i>	158
❖ Livelihoods pattern of char-chapori dwellers of Majuli	<i>Dinesh Pegu</i>	164
❖ ইঁসান চন্দ্ৰ মঁসাহাৰিনি আৰাৰি সুঁদ' সল'আব বেৰখাঁনায বৰ' মাহাৰিয়াৰি সাবগাৰি সুঁদ' বিজিৰনায	<i>Monoranjan Boro</i>	171
❖ কবি নৰকান্ত বৰুৱা আৰু তেওঁৰ দুটি কবিতা ('পলস' আৰু 'ইয়াত নদী আছিল' কবিতাৰ উল্লিখনসহ)	ৰুমী বৰ্মন	178

An Econometric Investigation Into Variation of Net Statedomestic Product Growth Rate Across Indian States in 2017-18

Homang Chetri

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 longtime. 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.

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).

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.

Assistant professor, Department Of Economics, Missamari College

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

Research 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.

Results and discussion

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-

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^{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:

β_0 = mean

β_1 = Coefficient of NSDP Per Capita of i^{th} state

β_2 = Coefficient of percentage of manufacturing in NSDP of i^{th} state

β_3 = Coefficient of roads per 1000 square km of i^{th} state

β_4 = Coefficient of percentage of Agriculture in NSDP of i^{th} state

β_5 = Coefficient of literacy rate of i^{th} state

β_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_1	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 table 1. The expected sign of the coefficient are positive except state location.

With SPSS software we got the following result :

Table 2 : Results of Regression Analysis (Impact on industrial growth) :

Variables/constant	Estimated coefficient	Standard error	t value	Significance level
β_0	8.696**	4.161	2.09	.059
X_1	-1.998	.000	-.501	.625
X_2	.091**	.035	2.586	.024
X_3	-.016	.029	-.575	.576
X_4	-.296**	.114	-2.590	.024
X_5	.044	.037	1.188	.258
D	.701	.804	.872	.400
R^2	.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^2 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.

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 -

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

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

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)

β_0 = constant and $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 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	
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 table3. 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
β_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 (β_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.

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.

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