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RELATIVE IMPORTANCE OF HIGHER EDUCATION EXPENDITURE ON INCOME INEQUALITY: AN EMPIRICAL ANALYSIS FROM MAJOR STATES OF RURAL INDIA

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ABSTRACT

There are mainly two issues of this work. The first one of this study is to test whether public expenditures on education taken by both various state governments and central government have been effective in reducing inequality in rural India. And the second one is to test the relative importance of higher education expenditure as compared to elementary and secondary expenditure for explaining (reducing) income inequality. To ensure sensitivity and robustness of the results, five different measures of income inequality are used. We consider various types of education expenditures, viz., government expenditures on elementary, secondary and higher levels. We have also tried to explain the nature of variation in all the variables (as mentioned in methodological part), viz, the dependent variable (income inequality measured by five methods) and all explanatory variables across 15 major states of India and over the time period from 1983 to 2012. In our results we have seen that the inter-state variation is more significant than inter-temporal variation for all explanatory variables and explained variable except school education expenditure and relative higher education expenditure. For school education expenditure and relative higher education expenditure the inter-temporal variation is more significant than inter-state variation. Using panel data for 15 major states of India for the period 1983 to 2012 and conclude that education expenditure helps reduce inequality in rural India. In particular, expenditure on higher education (including university, technical, adult and vocational) as opposed to elementary and secondary education is more effective in inequality reduction.

KEY WORDS: *Relative inequality, Absolute inequality, Education expenditure, Relative higher education expenditure*

INTRODUCTION

Economic inequality in a society normally refers to the gap between rich and poor, income inequality, wealth disparity, or "wealth and income differences" comprises all disparities in the distribution of economic assets and income. The term typically refers to inequality among individuals and groups within a society, but can also refer to inequality among countries. In macroeconomic context, income distribution is defined by how a nation's total GDP is distributed amongst its population. The issue of economic inequality is related to the idea of equity: equality of opportunity and equality of outcome. Though progressive taxation is thought to be the main instrument which reduces economic inequality and is demonstrated to be effective in international comparisons of income and wealth distribution, it creates disincentive towards income and employment and cannot be used in the long run. Neoclassical economics views inequalities in the distribution of income as arising from differences in value

added by labor, capital and land. Within labor income distribution is due to differences in value added by different classifications of workers. In this perspective, wages and profits are determined by the marginal value added of each economic actor (worker, capitalist/business owner, and landlord). Thus rising inequalities are merely a reflection of the productivity gap between highly-paid professions and lower-paid professions. Marxian economics attributes rising inequality to job automation and capital deepening within the ownership structure of capitalism, a process which conflicts with the capitalist property form and wage labor system. In this analysis, capitalist firms increasingly substitute labor inputs (workers) for capital equipment under competitive pressure to reduce costs and maximize profits. Over the long-term, this trend increases the organic composition of capital, meaning that fewer workers are required in proportion to capital inputs, increasing unemployment (the "reserve army of labour"). This process exerts a downward pressure on wages. The substitution of capital equipment for labor (mechanization and automation) raises the productivity of each worker, resulting in a situation of relatively stagnant wages for the working class amidst rising levels of property income for the capitalist class. A major cause of economic inequality within modern market economies is the determination of wages by the market. Some small part of economic inequality is caused by the differences in the supply and demand for different types of work. However, where competition is imperfect; information unevenly distributed; opportunities to acquire education and skills unequal; and since many such imperfect conditions exist in virtually every market, there is in fact little presumption that markets are in general efficient. This means that there is an enormous potential role for government to correct these market failures.

One important reason behind the existence of inequality is variation in individuals' access to education. Education, especially in an area where there is a high demand for workers, creates high wages for those having education. As a result, those who are unable to afford education, or choose not to pursue optional education, generally receive much lower wages leading to higher inequality. If there is no significant variation in access to education, then increase in education expenditure leads to decrease in inequality. However this paper examines a vital issue that explains how income inequality affected by the amount of funding by different state governments and central government on higher education relative to elementary and secondary level in India and its major 15 states?

BRIEF REVIEW OF LITERATURE

Many people would agree that income inequality is harmful to society. Benabou (1996) and Barro (1999) provide surveys of various theoretical arguments as to why inequality might deter economic growth. Alesinaand Rodrik (1994) and Persson and Tabellini (1994) both report that income inequality lowers growth in across section of countries although others have expressed doubts upon their findings. According to Alesina and Perotti (1996) countries with more income inequality are also more likely to suffer from political instability. Besides these views that societal inequalities are undesirable and that income inequalities may exert negative influences upon the economic and political environments, it is important to understand how policymakers try to reduce social inequalities and inequalities in the distribution of income. Education can play an important role in reducing both types of inequalities. Schultz (1963) proposes increasing human capital as one way to lower income inequality and increased support for public education might be one way to accomplish this. Some theoretical models also predict that public education lowers income inequality. Glomm and Ravi Kumar (1992) develop a model where agents can choose between a private and public education system. Although whether or not income inequality declines under a private education system depends upon parameters, income inequality unambiguously declines under a public education system. Saint-Paul and Verdier (1992), Eckstein and Zilcha (1994) and Zhang (1996) also developed models where continued support for public education lowers the level of income inequality over time. However, Sylwester (2000) developes a model where public education can lower the level of income inequality provided that agents have sufficient resources to forgo income and attend school. If people are too poor to attend school, then promoting public education can actually cause the distribution of income to become more skewed since the poor are taxed for revenue but do not enjoy the benefits of the public education system. In addition, Jimenez (1986) argues that many public education expenditures do not benefit the poor at all and, hence, do not lessen income inequality. Fields (1980) also argues that the degree of income inequality did not diminish even as many countries devoted more resources to public education. Finally, Ram (1989) reviews previous theoretical and empirical papers and concludes that there is not strong support that increasing education within the population lowers income inequality. Given these studies, it is not very clear whether public education expenditure can actually lower the level of income inequality over time.

Education is often considered to exert significant impact on personal income. Education can improve an individual's skills and signal his or her innate productivity; so that workers with a high educational attainment often receive high earnings. Expanding education investment is therefore believed to be one of the key measures to reduce poverty and income inequality, particularly in developing countries. As Ashen Felter and Rouse (2000, p.111) point out, "The school is a promising place to increase the skills and incomes of individuals. As a result, educational policies have the potential to decrease existing, and growing, inequalities in income". Heckman (2005) also declares that "human capital is the asset that ultimately determines the wealth. Fostering access to education will reduce inequality in the long run". Guangjie Ning (2010) points out that increasing educational expenditure with no complementary measures such as reforming the education system and establishing a competitive labour market helps less in reducing income inequality. Sylwester (2002) suggests that education expenditures may be important along other dimensions and, specially, to reducing income inequality. However, Kayet, A and Mondal, D (2015) examined that, public expenditure on education (all levels) significantly reduce income inequality in rural India. They suggested that if government takes a policy by increasing expenditure on education in their budget, inequality will obviously fall.

METHODOLOGY

We have used Panel data regression to explain income inequality by some socio-economic and demographic variables in rural India. If we take only cross section data or only time series data, proper results may not found. We have taken two views of income inequalities, viz, the rightist view of inequality or relative measure of inequality and the leftist view of inequality or absolute measure of inequality. There are very strong debates for using these two views of inequality. Kolm in his famous article 'Unequal Inequalities I' [Kolm, 1976] has well taken up this debate between absolute and relative inequality. He has been of the opinion that inequalities can be measured by both the ways and the researchers in this field have used both of them. He has tried to define a relative measure of inequality as a 'rightist' measure of inequality as the richer section of the community or the capitalist class or their union prefers to accept it when income increases (by equal amount or by equal proportion) and an absolute measure of inequality as 'leftist' measure of inequality as the poorer section of the community or the labour class or the labour union prefers to accept it when income increases. However, viewing relative measure of inequality as 'rightist' and absolute measure of inequality as 'leftist' is not completely true, because when income falls (by equal amount or by equal proportion) the richer section of the community or the capitalist class or their union prefers to accept an absolute measure of inequality and the poorer section of the community or the labour class or the labour union prefers to accept a relative measure. Anyway, these are two well accepted views and Kolm himself was convinced of both the views. And that's why we have considered both the views in Indian context.

In the present context, we constructed two families- the Gini family and the SD-CV family and used five separate measures of inequality under these families. For explaining the rightist view of inequality or relative measure of inequality two methods are used-Gini coefficient for Gini family and Coefficient of variation (CV) for SD-CV family. And for explaining the leftist view of inequality or absolute measure of inequality another two methods are used- absolute Gini for Gini family and standard deviation (SD) method for SD-CV family. Comparable absolute inequality in consumer expenditure can be easily measured if we have the values at constant prices. A simple absolute measure of inequality can be obtained by multiplying Gini coefficient by the respective average MPCE at constant prices. However, this measure is not very useful at all in the absolute context as the change in inequality from transfer of expenditure from one person to another is dependent on the number of persons present in between them and not on their income difference. Standard deviation of consumer expenditures as a measure of absolute inequality becomes better than absolute Gini as in this measure the change in inequality from transfer of expenditure from one person to another is dependent on their income difference. Also we used an index measure of inequality in SD-CV family as under Gini family the Gini coefficient and index measure of Gini family is more or less same. So it is unnecessary to compute index measure of Gini family as a separate measure. Therefore, we have taken above five measures for checking robustness.

We examined the role of public expenditure on education in explaining variation in inequalities of all types. Firstly, we have collected data on various components of total public expenditure on education: expenditure on elementary, secondary and higher education (including all other levels except school level) and used the total of elementary spending and secondary spending (school education expenditure) as an important explanatory variable for explaining inequality (Kayet and Mondal 2015). Secondly, we have calculated and used the

relative share of higher education expenditure as a separate explanatory variable, say, 'Relative higher education expenditure' (spending on higher education relative to the total of elementary and secondary spending) to find out the relative importance of higher education expenditure for explaining (reducing) income inequality. If government spends more on higher education relative to other two level immediate job opportunities create and income of the poor class increases.

Education expenditure individually cannot explain income inequality properly because income inequality depends on some socio-economic, demographic, political and other variables. Population is a very important demographic variable for explaining income inequality. It affects income inequality directly. If population of a country increases, income inequalities will also increase and vice-versa. We have estimated population in rural India by Lagrangian nonlinear interpolation method as per needs. Monthly per capita expenditure (MPCE) and work participation rate (WPR) are two important macroeconomic determinants for explaining economic growth. There is a direct relationship between MPCE & WPR and economic growth. If MPCE and WPR rise (fall) economic growth will also rise (fall). Theoretically there is an inverse relationship between economic growth and equity. If economic growth rise (fall) equity will fall (rise) means economic inequality will raise (fall). Thus there is a direct relationship between economic growth and economic inequality. Hence theoretically MPCE and WPR are positively related with income inequality. Share of non agricultural employment (SNAE) is also an important factor for explaining income inequality in rural India. If share of non agricultural employment increases in rural sector, this means a transfer of labourer from agricultural sector to non agricultural sector leading to an increase in income of rural poor, consequently the income gap between rich and poor is expected to decrease. Thus the relationship is expected to be inverse one. On the other hand, an increase in share of non agricultural employment may imply the development of the capitalist sector leading to a larger increase in non wage income than wage income and so an increase in inequality.

A two-way ANOVA test is used to explain the nature of variation in all the variables, viz, the dependent variable (income inequality as measured by five methods) and all explanatory variables across 15 major states of India and over the time period from 1983 to 2012. As inequality depends on a number of variables which have either inter-state or inter-temporal or both types of variation, inequality is expected to have significant variation of both types. Two-way ANOVA for all hypothesized factors are done in the second step to have a first-hand judgment about whether a factor is responsible for inter-temporal variation or for inter-state variation or both. If a factor is found to have a significant inter-state variation but an insignificant inter-temporal variation then this factor cannot be responsible for inter-temporal variation of inequality but this factor may or may not be responsible for inter-state variation of inequality.

VARIABLE AND DATA SOURCE

We have used various socio-economic as well as demographic variables as explanatory variables to explain income inequality. Here income inequality is measured by consumer expenditure data because in India direct income inequality data are not available. Consumer expenditure data of rural sector for different states of India are collected from NSSO consumer expenditure report from different quinquennial survey from 1983 to 2011-12. Public expenditure on education (different levels) by both various state governments & central government is used as one of the important explanatory variable in our model. Data of expenditure on education are taken from the Analysis of budget expenditure on education (various issues), Ministry of Human Resource Development, Government of India. Major important demographic and socio-economic variables that explain income inequality in rural sector like rural population of India (RPOP), monthly per capita expenditure in rural sector (RMPCE), work participation rate in rural sector (RWPR), share of non agricultural employment in rural sector (RSNAE) are used as explanatory variables in our model. Population data are collected from different Census report and we estimated population in rural India by Lagrangian nonlinear interpolation method as per needs. Data of monthly per capita expenditure in rural sector from NSSO consumer expenditure report, data of work participation rate in rural sector and share of non agricultural employment from NSSO Employment Unemployment report of different quinquennial survey from 1983 to 2011-12. Both consumer expenditure and school education expenditure are measured at constant (2009-10) prices.

THEORETICAL MODEL

Consider the random coefficient model is

$$Y_{it} = \alpha_i + \beta_i X_{it} + U_{it} \qquad i = 1, 2, 3, \ldots\ldots, 15$$

$$t = 1, 2, 3, \ldots\ldots, 7$$

Where,

Y_{it} = income inequality (measured by consumer expenditure) of different types.

X_{it} = f (SCHEDUEXP, RELHIGHEXP, RPOP, RMPCE, WPRATE, SNAGRIE)

U_{it} = error term

In the variance components model α_i are treated as random and $\beta_i = \beta$ for all i; i.e., the intercepts are random and the slope coefficients are all equal. In the random coefficient model β_i are also treated as random.

Let INQR denote the income inequality (consumer expenditure) in rural sector of India. Therefore, the empirical specification of our model is

$$INQR = \alpha + \beta_1 SCHEDUEXP + \beta_2 RELHIGHEXP + \beta_3 RPOP + \beta_4 RMPCE + \beta_5 RWPR + \beta_6 RSNAE + U$$

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Where, U is random error term.

Signs within parentheses are expected signs

EMPIRICAL FINDINGS

From our estimated results the overall explanatory power (R^2) is 49%, within groups or within States or inter-temporal explanatory power (R^2) is 42% and between groups or between States is 56% when Gini coefficient is the dependent variable. It is seen that the inter-state variation of income inequality is more significant than that of inter-temporal variation (see appendixTable1: ANOVA test).

Dependent variable: Relative inequality in Gini family (Gini coefficient)

INQR	Coef.	Std.	z	P>|z|	95% Conf. Interval	
SCHEDUEXP	-6.45E-06	1.22E-06	-5.29	0	-8.84E-06	-4.06E-06
RELHIGHEXP	-0.03745	0.010952	-3.42	0.001	-0.05892	-0.01599
RPOP	6.59E-10	2.52E-10	2.62	0.009	1.65E-10	1.15E-09
MPCETOTR	0.000116	2.21E-05	5.26	0	7.29E-05	0.000159
WPRATE	0.36922	0.07785	4.74	0	0.216636	0.521803
SNAGRI	0.009775	0.056017	0.17	0.861	-0.10002	0.119565
CONS	0.015342	0.044883	0.34	0.732	-0.07263	0.103312

R-square: within = 0.4195
between = 0.5559
overall = 0.4933

When absolute Gini is the dependent variable our empirical estimates give very significant results. The overall explanatory power (R^2) is 86%, within groups or within States or inter-temporal explanatory power (R^2) is 83% and between groups or between States is 89% It is seen that the inter-state variation of income inequality is more significant than that of inter-temporal variation (appendixTable1).

Dependent variable: Absolute inequality in Gini family (Absolute Gini)

INQR	Coef.	Std.	z	P>|z|	95% Conf. Interval	
SCHEDUEXP	-0.00907	0.001816	-4.99	0	-0.01263	-0.00551
RELHIGHEXP	-32.0515	16.51009	-1.94	0.052	-64.4107	0.307702
RPOP	8.68E-07	3.62E-07	2.39	0.017	1.57E-07	1.58E-06
MPCETOTR	0.472296	0.032623	14.48	0	0.408356	0.536236
WPRATE	332.4471	112.9768	2.94	0.003	111.0166	553.8776
SNAGRI	-9.35958	82.53721	-0.11	0.91	-171.13	152.4104
CONS	-305.57	65.41719	-4.67	0	-433.785	-177.354

R-square: within = 0.8250
between = 0.8932
overall = 0.8585

When coefficient of variation of income/ expenditure is the dependent variable our empirical estimates give significant results. The overall explanatory power (R^2) is 31%, within groups or within States or inter-temporal explanatory power (R^2) is 27% and between groups or between States is 40%. It is seen that the inter-state variation of income inequality is more significant than that of inter-temporal variation (appendixTable1).

Dependent variable: Relative inequality (CV) in SD-CV family

INQR	Coef.	Std.	z	P>|z|	95% Conf.	Interval
SCHEDUEXP	-1.8E-05	4.56E-06	-3.89	0	-2.7E-05	-8.78E-06
RELHIGHEXP	-0.10482	0.042418	-2.47	0.013	-0.18796	-0.02169
RPOP	2.01E-09	8.51E-10	2.36	0.018	3.42E-10	3.68E-09
MPCETOTR	0.000278	8.03E-05	3.46	0.001	0.00012	0.000435
WPRATE	1.011259	0.268438	3.77	0	0.48513	1.537389
SNAGRI	0.032493	0.201794	0.16	0.872	-0.36302	0.428002
CONS	-0.09508	0.156891	-0.61	0.544	-0.40258	0.21242

R-square: within = 0.2690
between = 0.4045
overall = 0.3122

When standard deviation of income/ expenditure is the dependent variable our empirical estimates give very significant results. The overall explanatory power (R^2) is 62%, within groups or within States or inter-temporal explanatory power (R^2) is 59% and between groups or between States is 79%. It is seen that the inter-state variation of income inequality is more significant than that of inter-temporal variation (appendixTable1).

Dependent variable: Absolute inequality (SD) in SD-CV family

INQR	Coef.	Std.	z	P>|z|	95% Conf.	Interval
SCHEDUEXP	-0.0352	0.011687	-3.01	0.003	-0.0581	-0.01229
RELHIGHEXP	-124.688	115.241	-1.08	0.279	-350.556	101.1804
RPOP	4.15E-06	1.89E-06	2.2	0.028	4.48E-07	7.86E-06
MPCETOTR	1.536171	0.193212	7.95	0	1.157483	1.914859
WPRATE	1265.217	602.5825	2.1	0.036	84.17706	2446.257
SNAGRI	262.2967	478.0175	0.55	0.583	-674.6	1199.194
CONS	-1418.36	360.1798	-3.94	0	-2124.3	-712.423

R-square: within = 0.5925
between = 0.7911
overall = 0.6207

When inequality index is the dependent variable our empirical estimates give very significant results. The overall explanatory power (R^2) is 63%, within groups or within States or inter-temporal explanatory power (R^2) is 28% and between groups or between States is 81%. It is seen that the inter-state variation of income inequality is more significant than that of inter-temporal variation (appendixTable1).

Dependent variable: Inequality index (SD-CV) in SD-CV family

INQR	Coef.	Std.	z	P>|z|	95% Conf.	Interval
SCHEDUEXP	-3.84E-09	1.01E-09	-3.8	0	-5.82E-09	-1.86E-09
RELHIGHEXP	-2.4E-05	9.42E-06	-2.59	0.01	-4.3E-05	-5.96E-06
RPOP	-3.45E-13	1.88E-13	-1.84	0.066	-7.13E-13	2.34E-14
MPCETOTR	7.25E-08	1.78E-08	4.08	0	3.76E-08	1.07E-07
WPRATE	8.04E-05	5.93E-05	1.36	0.175	-3.6E-05	0.000197
SNAGRI	-1.7E-05	4.47E-05	-0.37	0.711	-0.0001	0.000071
CONS	4.53E-05	3.47E-05	1.31	0.191	-2.3E-05	0.000113

R-square: within = 0.2777
between = 0.8147
overall = 0.6256

In the first step, we see that public expenditure on school education (SCHEDUEXP) is negatively affects income inequality in India and its major states in both senses (relative as well as absolute i.e. in rightist and leftist view of inequality). It is statistically significant at the level of 0% in both relative sense and absolute sense. Only when we measure absolute inequality in SD-CV family, it is significant at the level 0.3%. But in our estimated results it can be concluded that it highly significant explanatory variable for reducing income inequality in rural India. So our hypothesis is accepted. It means that if public expenditure on school education increases, income inequality will decrease and vice-versa. This happens because more expenditure on school education leads to more education for all and consequently more employment of poor people. It is seen that the inter-temporal variation of school education expenditure is more significant than inter-state variation (appendix Table1).

In our results rural population is positively related with rural income inequality in both senses. Only in case of explaining inequality index in SD-CV family the sign of coefficient of rural population is negative and in that case our hypothesis is rejected. The results are very robust because it is statistically significant at the level of either 1% (for Gini coefficient as dependent variable) or less than 5% in other all cases. So our hypothesis is accepted. In our estimated results (in both senses) the hypotheses about MPCE is accepted as it affects inequality directly in all measures. Here MPCE is the most significant factor in both senses for explaining income inequality as it is statistically significant at 0% in both cases (0.1% in CV measure). WPR is also affects inequality directly and it is highly significant factor for explaining income inequality in rural India as it is statistically significant at 0% in relative inequality (both Gini family and SD-CV family) and, 0.3% in absolute inequality (measured by absolute Gini) and that of also 3.6% in absolute inequality (measured by standard deviation). Only in case for explaining inequality index of SD-CV family it is not significant factor as it is statistically significant at the level of more than 10%. Share of non agricultural employment (SNAE) is insignificant in both cases as it is statistically significant at the level of more than 10%. Because in rural India share of non agricultural employment is very low and so there is no significant role for explaining inequality. Though it has no important individual role for explaining income inequality in rural sector of India, it has an important role in our overall model. If we exclude this variable from our model the overall explanatory power falls significantly in all cases. From the ANOVA test it is seen that the inter-state variation of rural population, rural monthly per capita expenditure, rural work participation rate and rural non-agricultural employment are more significant than that of inter-temporal variation (appendix Table1).

In the second step, we entered into the question, is there any efficiency of higher education expenditure for reducing income inequality in rural India? The answer is yes. In our estimated results it is seen that relative higher education expenditure (RELHIGHEXP) is very significant factor for reducing income inequality. It is statistically significant at 0.1% for explaining relative inequality (measured by Gini coefficient) in Gini family, 5.2% for explaining absolute inequality (measured by absolute Gini) in Gini family, 1.3% for explaining relative inequality (measured by CV) in SD-CV family, 1% for explaining inequality index (measured by SD-CV) in SD-

CV family. Only it is not significantly explain absolute inequality in SD-CV family measured by SD as it is statistically significant at the level of more than 10%. It affects all types of inequality inversely. It means that if public expenditure on higher education relative to other two level of expenditure increases, income inequality falls and vice-versa. It is also seen that the inter-temporal variation of school education expenditure is more significant than inter-state variation (appendix Table1).

CONCLUDING REMARKS

The principal objective of this study is to analyze the factors affecting income inequality in rural sector of India. The factors include sum of elementary and secondary education expenditure, expenditure on higher education relative to total of other two levels of spending, rural population, rural monthly per capita consumption expenditure, rural work participation rate and share of non agricultural employment in rural sector. The results of this study are consistent across all five measures of income inequality used. In our study it is seen that government spends near about half of their total spending on education for elementary level and near about one-third on secondary level. But this spending is very little for higher education level (including university education, technical education, vocational education, teacher training etc) and it is near about one-fifth of their total spending on education. Our principal conclusions can be summarized as follows: firstly, government should spend more in absolute sense on school level education and also more spend on total education to reduce income inequality in rural India (Kayet & Mondal, 2015). And the second vital issue is that, government should increase the proportion of spending on higher education level relative to other two levels-elementary and secondary levels to reduce income inequality in rural India.

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Appendix

Table1:

ANOVA TESTS (Two-Factor Without Replication)						
Relative Inequality (Gini)						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	0.113999	14	0.008143	10.45381	3.48E-13	1.811297
Inter temporal	0.022612	6	0.003769	4.838184	0.000275	2.208554
Absolute Inequality (Gini)						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Inter State	866945.9	14	61924.71	11.86138	1.43E-14	1.811297
Inter temporal	226228.1	6	37704.68	7.222149	3.10E-06	2.208554
Relative Inequality (CV)						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	0.734525	14	0.052466	5.386169	3.34E-07	1.811297
Columns	0.288377	6	0.048063	4.93413	0.000228	2.208554
Absolute Inequality (SD)						
Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Inter State	7587920	14	541994.3	3.943782	3.65E-05	1.811297
Inter temporal	3212875	6	535479.1	3.896374	0.001758	2.208554
Inequality Index (SD-CV)						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	1.05E-07	14	7.49E-09	15.93376	4.31E-18	1.811297
Columns	1.7E-08	6	2.84E-09	6.041333	2.74E-05	2.208554
School Education Expenditure						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	4.96E+08	14	35450973	10.90709	1.21E-13	1.811297
Inter temporal	7.54E+08	6	1.26E+08	38.66742	3.53E-22	2.208554
Relative Higher Education Expenditure						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	1.392237	14	0.099446	3.260943	0.000374	1.811297
Inter temporal	2.80183	6	0.466972	15.31259	8.94E-12	2.208554
Rural Population						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	7.89E+16	14	5.63E+15	143.4807	2.16E-52	1.811297
Inter temporal	3.11E+15	6	5.18E+14	13.20656	1.78E-10	2.208554
Rural MPCE						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	4931718	14	352265.5	28.13018	7.74E-26	1.811297
Inter temporal	2675206	6	445867.7	35.60478	4.18E-21	2.208554
Rural Work Participation Rate						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Inter State	0.415643	14	0.029689	68.23245	9.82E-40	1.811297
Inter temporal	0.029624	6	0.004937	11.34736	2.98E-09	2.208554

Source: Calculated by authors

Appendix Table-2: Trends in relative inequality (Gini coefficient) in major states of India (Rural)

	RURAL						
STATES	**1983-84**	**1987-88**	**1993-94**	**1999-00**	**2004-05**	**2009-10**	**2011-12**
ANDHRA PRADESH	0.292	0.301	0.290	0.240	0.290	0.278	0.271
ASSAM	0.195	0.222	0.180	0.200	0.190	0.244	0.172
BIHAR	0.255	0.264	0.220	0.210	0.200	0.225	0.190
GUJARAT	0.252	0.233	0.240	0.230	0.270	0.254	0.266
HARYANA	0.279	0.281	0.300	0.240	0.320	0.301	0.245
KARNATAKA	0.300	0.292	0.270	0.240	0.260	0.234	0.305
KERALA	0.330	0.323	0.290	0.270	0.340	0.417	0.472
MADHYA PRADESH	0.292	0.290	0.280	0.240	0.270	0.292	0.275
MAHARASHTRA	0.283	0.331	0.300	0.260	0.310	0.268	0.277
ORISSA	0.257	0.267	0.240	0.240	0.280	0.261	0.217
PUNJAB	0.279	0.293	0.260	0.240	0.280	0.289	0.293
RAJASTHAN	0.340	0.311	0.260	0.210	0.250	0.225	0.217
TAMIL NADU	0.324	0.323	0.310	0.280	0.320	0.264	0.288
UTTAR PRADESH	0.290	0.279	0.280	0.250	0.290	0.263	0.237
WEST BENGAL	0.284	0.252	0.250	0.220	0.270	0.238	0.218

Source: NSS Consumer expenditure data and calculated by authors

Appendix Table-3: Trends in absolute inequality (Gini) in major states of India (Rural) (Rs. At 2009-10 prices)

	RURAL						
STATES	**1983-84**	**1987-88**	**1993-94**	**1999-00**	**2004-05**	**2009-10**	**2011-12**
ANDHRA PRADESH	190.36	225.30	217.13	178.75	256.40	283.63	349.09
ASSAM	124.29	190.15	119.40	143.41	160.03	210.49	150.40
BIHAR	135.13	168.16	127.91	133.15	128.90	153.55	160.20
GUJARAT	174.71	175.51	188.28	215.68	242.03	251.95	326.46
HARYANA	268.93	281.20	305.04	285.81	419.14	420.07	386.80
KARNATAKA	197.60	203.24	189.15	201.75	201.17	189.25	358.88
KERALA	270.70	318.53	296.43	346.14	522.47	771.38	995.87
MADHYA PRADESH	165.78	191.84	184.16	162.53	176.34	232.64	241.27
MAHARASHTRA	176.50	248.12	217.10	214.76	263.72	271.05	333.05
ORISSA	143.50	158.99	140.79	152.25	169.85	178.68	160.55
PUNJAB	268.93	334.37	301.83	296.90	356.96	426.76	511.04
RAJASTHAN	243.49	258.53	220.81	191.82	218.88	225.82	261.60
TAMIL NADU	205.28	232.26	237.52	240.36	287.21	255.47	364.04
UTTAR PRADESH	171.31	193.76	201.02	192.07	230.60	217.58	208.19
WEST BENGAL	167.56	176.00	184.47	170.56	228.81	104.30	209.03

Source: NSS Consumer expenditure data and calculated by authors

Appendix Table-4: Trends in relative inequality (CV) in major states of India (Rural)

STATES	1983	1987-88	1993-94	1999-00	2004-05	2009-10	2011-12
ANDHRA PRADESH	0.6171	0.6575	0.6182	0.4874	0.6292	0.5641	0.5745
ASSAM	0.3960	0.4584	0.3398	0.3903	0.3815	0.4930	0.3576
BIHAR	0.5443	0.6083	0.4555	0.4234	0.4201	0.4260	0.3937
GUJARAT	0.5506	0.4831	0.4721	0.4515	0.5434	0.5149	0.6179
HARYANA	0.5786	0.5765	0.5896	0.4420	0.6668	0.6015	0.4752
KARNATAKA	1.2250	0.6556	0.5520	0.4856	0.6610	0.4547	0.8037
KERALA	0.7439	0.6903	0.5682	0.5125	0.6605	1.0060	1.0236
MADHYAPRADESH	0.6327	0.6384	0.5988	0.5036	0.5659	0.5924	0.5878
MAHARASHTRA	0.5928	0.8870	0.6474	0.5149	0.6664	0.5330	0.6162
ORISSA	0.5518	0.5840	0.5145	0.4881	0.6187	0.5029	0.4452
PUNJAB	0.5564	0.5963	0.5145	0.4458	0.5373	0.5833	0.5653
RAJASTHAN	0.7419	0.6546	0.5307	0.4065	0.5353	0.4353	0.4455
TAMIL NADU	0.7112	0.7200	0.6719	0.5863	0.7665	0.5304	0.6399
UTTAR PRADESH	0.6292	0.6037	0.5703	0.5083	0.6560	0.5357	0.5178
WEST BENGAL	0.5708	0.5688	0.5649	0.4574	0.6161	0.4726	0.4499

Source: NSS Consumer expenditure data and calculated by authors

Appendix Table-5: Trends in absolute inequality (SD) in major states of India (Rural)
(Rs. At 2009-10 prices)

	RURAL						
STATES	**1983-84**	**1987-88**	**1993-94**	**1999-00**	**2004-05**	**2009-10**	**2011-12**
ANDHRA PRADESH	402.06	490.81	470.54	370.60	557.12	575.51	894.33
ASSAM	252.57	328.52	231.03	278.36	312.87	425.68	276.61
BIHAR	288.03	387.48	261.93	273.54	264.49	290.09	282.36
GUJARAT	381.58	363.45	377.68	416.54	489.93	512.30	855.17
HARYANA	504.21	577.91	598.02	528.30	869.57	838.27	1106.72
KARNATAKA	1027.07	456.44	391.51	406.59	507.12	366.70	966.34
KERALA	609.83	680.39	584.54	651.34	1011.77	1861.74	4485.65
MADHYA PRADESH	359.00	422.05	398.11	338.86	376.17	471.90	433.67
MAHARASHTRA	369.69	665.94	465.04	427.99	571.78	538.82	826.24
ORISSA	307.92	347.67	297.92	304.93	373.19	343.40	242.40
PUNJAB	535.46	681.12	587.05	554.17	686.53	863.23	1635.25
RAJASTHAN	531.81	543.44	451.17	373.59	477.32	437.29	601.51
TAMIL NADU	450.73	518.84	519.91	504.28	697.95	513.69	941.18
UTTAR PRADESH	371.12	418.61	413.17	396.94	527.81	443.89	387.56
WEST BENGAL	337.08	398.69	415.37	348.45	523.21	404.11	402.03

Source: NSS Consumer expenditure data and calculated by authors

Appendix Table-6: Trends in inequality index (SD-CV) in major states of India (Rural)

STATES	1983	1987-88	1993-94	1999-00	2004-05	2009-10	2011-12
ANDHRA PRADESH	0.000094	0.000097	0.000087	0.000066	0.000084	0.000075	0.000077
ASSAM	0.000095	0.000106	0.000075	0.000082	0.000077	0.000096	0.000069
BIHAR	0.000071	0.000081	0.000058	0.000050	0.000047	0.000045	0.000041
GUJARAT	0.000112	0.000096	0.000089	0.000081	0.000095	0.000088	0.000105
HARYANA	0.000178	0.000170	0.000163	0.000115	0.000169	0.000149	0.000117
KARNATAKA	0.000233	0.000121	0.000097	0.000083	0.000110	0.000075	0.000131
KERALA	0.000163	0.000151	0.000119	0.000104	0.000139	0.000230	0.000246
MADHYAPRADESH	0.000094	0.000091	0.000086	0.000076	0.000084	0.000084	0.000081
MAHARASHTRA	0.000091	0.000131	0.000091	0.000070	0.000088	0.000068	0.000078
ORISSA	0.000112	0.000115	0.000097	0.000088	0.000109	0.000086	0.000075
PUNJAB	0.000156	0.000162	0.000134	0.000112	0.000132	0.000141	0.000136
RAJASTHAN	0.000139	0.000117	0.000088	0.000063	0.000079	0.000061	0.000062
TAMIL NADU	0.000122	0.000120	0.000112	0.000099	0.000129	0.000088	0.000105
UTTAR PRADESH	0.000064	0.000059	0.000053	0.000045	0.000056	0.000044	0.000041
WEST BENGAL	0.000088	0.000084	0.000079	0.000061	0.000080	0.000061	0.000057

Source: NSS Consumer expenditure data and calculated by authors

Appendix Table-7: State wise data of percentage share of expenditure on elementary education to total expenditure on education.

STATES	1983	1987-88	1993-94	1999-00	2004-05	2009-10	2011-12
ANDHRA PRADESH	49.12	43.90	39.26	29.18	44.84	26.08	31.98
ASSAM	50.33	48.58	58.86	34.31	46.24	44.82	45.23
BIHAR	61.55	70.82	65.00	36.48	33.08	50.57	47.11
GUJARAT	54.99	48.68	55.82	44.46	46.50	63.79	47.27
HARYANA	39.27	36.01	44.39	36.81	41.00	43.17	42.64
KARNATAKA	54.32	49.76	53.47	42.22	50.64	45.85	42.34
KERALA	52.38	49.49	47.46	31.90	38.34	32.53	32.13
MADHYA PRADESH	48.67	55.68	62.52	48.36	45.99	51.52	54.80
MAHARASHTRA	43.96	44.92	44.31	22.32	36.78	45.68	37.91
ORISSA	42.34	55.36	56.83	40.51	52.62	44.43	49.20
PUNJAB	33.52	32.13	34.62	21.64	21.09	18.34	24.19
RAJASTHAN	52.88	45.10	52.11	45.96	52.39	56.47	54.45
TAMIL NADU	48.16	48.28	49.96	38.47	34.30	41.34	36.96
UTTAR PRADESH	48.12	48.19	53.89	46.81	43.86	48.54	56.33
WEST BENGAL	41.81	39.56	28.13	18.43	33.24	33.62	35.13

Source: Calculated from analysis of budget expenditure on education (various issues)

Appendix Table-8: State wise data of percentage share of expenditure on secondary education to total expenditure on education.

STATES	1983	1987-88	1993-94	1999-00	2004-05	2009-10	2011-12
ANDHRA PRADESH	26.58	28.57	24.89	17.27	27.22	24.41	26.34
ASSAM	33.08	27.81	26.26	15.52	21.47	20.88	23.53
BIHAR	21.11	0.86	19.30	10.83	12.32	14.86	18.97
GUJARAT	30.10	34.84	30.59	26.39	26.70	32.15	24.78
HARYANA	43.09	40.16	34.73	33.76	27.61	25.17	24.65
KARNATAKA	21.88	30.71	28.30	25.28	23.99	27.36	25.57
KERALA	28.74	29.11	31.01	21.23	31.74	32.39	36.25
MADHYA PRADESH	35.32	23.62	20.41	15.60	10.57	18.07	21.64
MAHARASHTRA	35.42	38.16	38.53	18.92	35.62	40.42	33.64
ORISSA	37.89	23.24	21.73	20.99	23.89	22.66	21.53
PUNJAB	49.19	49.08	48.35	40.18	55.00	53.42	52.12
RAJASTHAN	32.70	37.56	33.71	29.89	30.81	32.55	32.54
TAMIL NADU	27.33	39.68	33.77	30.72	30.98	38.79	32.11
UTTAR PRADESH	36.46	40.95	32.47	26.34	23.29	23.54	25.22
WEST BENGAL	39.07	43.84	39.82	28.39	42.54	51.07	41.88

Source: Calculated from analysis of budget expenditure on education (various issues)

Appendix Table-9: State wise data of percentage share of expenditure on higher education to total expenditure on education.

STATES	1983	1987-88	1993-94	1999-00	2004-05	2009-10	2011-12
ANDHRA PRADESH	24.30	27.54	35.86	53.56	27.94	49.51	41.67
ASSAM	16.59	23.60	14.88	50.18	32.29	34.30	31.24
BIHAR	17.33	28.32	15.70	52.70	54.61	34.58	33.92
GUJARAT	14.91	16.49	13.59	29.15	26.80	4.06	27.95
HARYANA	17.64	23.83	20.88	29.42	31.39	31.67	32.71
KARNATAKA	23.80	19.52	18.22	32.50	25.37	26.79	32.09
KERALA	18.88	21.39	21.53	46.86	29.92	35.08	31.62
MADHYA PRADESH	16.02	20.70	17.07	36.04	43.44	30.41	23.55
MAHARASHTRA	20.62	16.92	17.15	58.76	27.60	13.90	28.44
ORISSA	19.77	21.39	21.44	38.50	23.48	32.91	29.27
PUNJAB	17.29	18.80	17.03	38.18	23.91	28.24	23.68
RAJASTHAN	14.41	17.34	14.18	24.15	16.79	10.98	13.02
TAMIL NADU	24.51	12.05	16.27	30.81	34.72	19.87	30.93
UTTAR PRADESH	15.41	10.87	13.64	26.85	32.85	27.93	18.45
WEST BENGAL	19.12	16.60	32.05	53.17	24.22	15.32	22.99

Source: Calculated from analysis of budget expenditure on education (various issues)