THE EFFECTIVENESS OF PUBLIC EXPENDITURE ON SOCIAL SERVICES:

AN EMPIRICAL STUDY OF INDIAN STATES

A THESIS SUBMITTED FOR THE DEGREE OF

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IN

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BY

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CERTIFICATE

This is to certified that the work embodied in this thesis entitled **"THE EFFECTIVENESS OF PUBLIC EXPENDITURE ON SOCIAL SERVICES: AN EMPIRICAL STUDY OF INDIAN STATES"** has been carried out by **DASARI SARALA**, for the award of the degree of **DOCTOR OF PHILOSOPHY** under my supervision and the same has not been submitted elsewhere for a degree.

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DECLARATION

I hereby declare that the work embodied in this thesis entitled **" THE EFFECTIVENESS OF PUBLIC EXPENDITURE ON SOCIAL SERVICES: AN EMPIRICAL STUDY OF INDIAN STATES"** is carried out by me under the supervision of **Professor J.V.M. SARMA,** Department of Economics, University of Hyderabad, and has not submitted in part or in full to any other University or Institution.

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Dasari Sarala Lenin
University of Hyderabad

To My Beloved Parents

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

BE	Budget Estimation
BSS	Basic Social Service
CMR	Child mortality rate
CDR	Crude death rate
DOR	Drop-out rates
DUM	Dummy
ESAP	Economic Structural Adjustment Programme
FE	Fixed Effects
GOI	Government of India
GDP	Gross Domestic Product
GER	Gross enrolment ratio
GSDP	Gross State Domestic Product
HDI	Human Development Index
IMR	Infant mortality rate
LEBF	Life expectancy at birth for females
LEBM	Life expectancy at birth for males
LSDV	Least square dummy variable
LR	Literacy rate
NCERT	National Council of Educational Research and Training
OLS	Ordinary least square
PCI	Per capita income
RE	Revised Estimation

RGI	Register General of India
TEXPH	Total expenditure on health
TEXPE	Total expenditure on education
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction

Throughout the history of Independent India, the Indian government claimed that it wants to work towards social development and the eradication of poverty. In the early 1990s, world summits and global conferences set specific social developmental targets in the hope that these would lead to a new commitment to human development in economic and social policies. According to a report, (Human Development Reports of UNDP; 2002) nearly a hundred crore people in the world are illiterate and around 13 crore children of school age (about 60 per cent of them girls) are not in school. One-third of all children in developing countries fail to complete four years of primary education. One third of all children in developing countries are undernourished, rising to half of all the children in South Asia (8 crore) across the region. Around 170 crore people lack safe water, over half the world's people (330 crore) are without access to adequate sanitation. The goals set at the World Summit for Children in 1990 promised universal access to primary education by the year 2000.

In India the Constitution provides for supply of basic social services by the governments at the Central, State and local levels. Accordingly, substantial allocations are made in the budgets for education, health and other social services. Approximately, 20 percent of the total expenditure of the Centre is allocated for the social sector

services. At the State level the supply of basic social services is a key component of the budgets and as much as 30 percent of the government expenditure is earmarked although the proportion varies across the States. However, to what extent the expenditure results in the social development is not known. Wrong prioritization and lack of accountability can reduce the effectiveness of these budgetary allocations.

The claims of the government that poverty eradication and social sector development generally are main challenges and that it is fully committed to address these issues have to continue over time. The aim of the study is to analyse the impact of public policy in terms of the public expenditure incurred on social services such as health and education on human development. The questions addressed are: firstly, to what extent the population size acts as the main determining factor in guiding the expenditure allocation to provision of social services, and secondly, to what extent the money spent by government is transformed to the end results of better human development indicators.

1.2 Arguments for State Provision

It is also well accepted that provision of the basic social services is an important function of Governments. There are four main arguments for the State provision of universal basic social services: moral, instrumental, consensual and historical. (Mehrotra S, V.J, and Delomonica E (2000) Pg.6-7).

1.2.1 The Moral Argument

The strong moral argument for universal access says that basic social services have intrinsic value because they generate such benefits as learning and good health, and that they should, therefore, be available to all. This argument sees basic social services as "merit goods" – goods that have an inherent worth and that should be supplied whatever the circumstances, even if there appears to be no express demand. The State cannot depend upon private suppliers to provide such services – it must step in to ensure their provision.

1.2.2 Instrumental Argument

The instrumental argument for basic social services is based on the fact that their provision supports the achievement of other human development goals. Education, for example, contributes to greater productivity, better health, more equitable income distribution, and less poverty.

1.2.3. The Consensual Argument

There is a general consensus that access to basic social services should be universal. This consensus is implicit in the Convention on the Elimination of all Forms of Discrimination against Women (1979), and explicit in the Covenant on Economic, Social and Cultural Rights (1966), the Declaration on the Right to Development (1986) and the Convention on the Rights of the Child (1989). It was reiterated in the Plan of Action from the World Summit for Children (1990) and in the Copenhagen Declaration from the World Summit for Social Development (1995).

1.2.4 The Historical Argument

Historically also, there are well-set conventions for State provision of social services and several studies in the past recognized that government spending on social sectors has a significant role to play in the economic development. The historical argument for State provision of basic social services originates in the 1800s. Governments in the industrializing countries realized that industrial growth required national communities that were both economically and socially viable. Literate and healthy populations would be needed to fuel the changes taking place. There were several factors behind the drive to mass literacy, for example. First, there was a realization that people who could read could more easily acquire other skills and play a more active role in the shift to industrialization. Second, the social unrest that began with the French Revolution and continued through the 1840s created anxieties about order and control. While there were many who argued for repressive measures, education seemed one positive way to reassert the authority of the State and reinforce discipline. Third, the experience of the American Civil War (1861-65) and the Franco-Prussian War (1870-71) suggested that education contributed to military efficiency, as the victors possessed well-established school systems, while the vanquished did not. Fourth, with the expansion of suffrage, education was seen as one method of opening the doors to greater political discourse. Of course, this was precisely why some people were opposed to the whole notion of greater literacy – they did not want workers who were more receptive to radical and subversive theories.

Nevertheless, rising government expenditure pumped life into school systems and boosted literacy rates. School attendance was made compulsory and resistance was eased by the reduction or elimination of fees, with the costs covered by taxation. Progress was rapid, by mid 19th century there was some kind of formal, systematic schooling in most industrializing countries. By 20th century, the vast majority had State-financed and regulated elementary school systems to provide nationwide, universal and compulsory education. It had become widely accepted that education was a fundamental responsibility of the State, that the State had both the right and the authority to use taxation to support schools and that every child should have access to a free, non-sectarian school system.

Transformations in health care followed similar lines as expanding economies required a healthy workforce. The growing emphasis on public health care meant the construction of hospitals and clinics, the appearance of government health bureaucracies, public water supply and sewerage systems, and the creation of a formidable system of controls on food production, health insurance schemes, and workplace, housing and school health ordinances.

1.3 International Experience

In general, expenditures as a percentage of total government expenditure varies among countries and across time, but the expenditure on basic social services is between 12 and 14 per cent. There is a clear link between human development indicators, such as infant mortality and primary school enrolment, and the fiscal priority given by

governments to basic social services. Despite its fairly low income levels, Sri Lanka has very high levels of literacy, enjoys universal primary school enrolment and has achieved infant mortality rates comparable to those found in some industrialized countries. Elsewhere in South Asia, however, countries such as Bangladesh have poorer human development indicators and have given less fiscal priority to basic services. Thailand, with relatively high social indicators, appears to have allocated a higher share of government spending than other Asian governments. While some countries may have comparable levels of fiscal priority and marked differences in their human indicators, this phenomenon occurs only over a short period of time – one or two years at most. There is evidence that relative high-achievers, such as Sri Lanka and Thailand, have prioritized basic social services for a longer period of time. Thus, the relatively good results and progress in school enrolments and child survival in countries as diverse as Namibia, Sri Lanka, and Uganda (especially in education) are not surprising, given their expenditure patterns. The importance of efficiently spending these resources is highlighted by cases such as Niger and Peru; with relatively high allocations and not particularly impressive results for children's well-being, there are many possible sources of inefficiency. Finally, low expenditure countries like Cameroon, Philippines, Nicaragua, and Zambia experience relatively disappointing outcomes, especially given their levels of income, in terms of child mortality and education.

1.4 Problem of the Study

While the achievements of the post-independence Indian economy are indeed striking in comparison with the record of our performance during the first fifty years of the twentieth century, it has nevertheless fallen short of our expectations. Our performance has also been well short of what has been achieved by other developing countries, particularly, in East Asia triggering the concern that we performed below our potential. As measured by the social indicators, the performance of the country is even less impressive particularly in education and health services

India has made large strides in educating its population of more than a billion people, yet a lot remains to be done. Literacy rates have increased for both males and females, and though the latter continues to lag behind the former, there has been a narrowing of the male-female gap in literacy: from 24.8% in 1991 to 21.7% in 2001. In 2001, the absolute number of illiterates declined historically for the first time by nearly 32 million. While there has been some catching up in literacy rates for both males and females between rural and urban areas, the differences continue to be unacceptably large, especially for females. Only 46% of females in rural areas were literate as opposed to nearly 73% in urban areas in 2001, a gap of around 27 percentage points. For males, the gap was lower at around 15% percentage points with 71.18% of males in rural areas and 86.42% in urban areas being literate in 2001. However, school attendance has been rising for both girls and boys at the elementary school level in both rural and urban areas. But fewer girls attend school in rural areas compared to their urban counterparts, and also compared to boys in rural areas. The proportion of girls

attending schools, however, has increased from 59% to 70% between the years under comparison (Dreze and Sen: 2002). Of the 200 million children in the age group 6-14, it is estimated that 59 million are out of school. Of these 35 million are girls and 24 million are boys (Ministry of Human Development, GOI). Moreover, there is a lot of 'waste' in the educational system with dropout rates as high as 40% for the country as a whole and in some Indian States, they are as high as 75%. Though the number of primary schools in the country increased, more than 1 lakh habitations still do not have access to a primary school within a distance of one kilometer. Teacher-pupil ratios are inadequate: less than 2 teachers are available in rural areas to teach a class size of around 100 students. Teacher motivation and teaching incentives are also very weak. India perhaps has the highest rate of teacher truancy in the world.

In terms of State-wise performance, Kerala continues to occupy first rank as it has done historically; on the other hand, densely populated States like Uttar Pradesh, Rajasthan and Bihar are yet to overcome their educational inertia. Despite the strong constitutional backing for the provision of primary education in India and its expansion over time, the system is characterized not only by low achievements but also by large unevenness of achievements. Huge gaps remain between rural and urban areas, and the probability of getting any education at all sharply depends on gender, caste and income. Women, scheduled castes and scheduled tribes and the poor are faced with formidable barriers when it comes to getting basic education.

Health wise, however, the picture for India is bleak. All health indicators register an improvement over time. Nevertheless, their levels are still unacceptable. Even though infant mortality rates have declined from a high of 110 in 1981 to 68 in 2000, it is still very high compared to other countries. Total fertility rates are 3.2% for India as a whole, still above replacement levels. Overall life expectancy at birth has doubled for both males and females between 1941-1951 and 2000: from 32.4 years to 63.3 years for males and from 31.7 years to 65.6 years for females. Although female life expectancy is slightly higher than male life expectancy, achievements along other dimensions of women's health in India are very low. India has one of the highest maternal mortality rates in the world, registering as many as 407 maternal deaths per 100,000 live births in 2000.

The average figures for India hide a great deal of variation in the performance of different States, which are on different points along the health transition path. Health transition has three components: demographic which involves lowering of mortality and fertility rates and an aging population; epidemiological wherein the pattern of diseases prevalent in the population changes from communicable diseases to non-communicable diseases such as the chronic diseases of adulthood; and social whereby people develop better ability to self-manage their health and have better knowledge and expectations from the health system. While Kerala, Maharastra and Tamil Nadu are much further along in the health transition trajectory, the densely populated States of Orissa, West Bengal, Bihar, Rajasthan, Madhya Pradesh and Uttar Pradesh are still in the early part, with the other States falling in between. Apart from variations due to

income and education, health status in India varies systematically between rural-urban location, membership of scheduled caste and scheduled tribe, and by age and gender. All health indicators for rural areas compare unfavorably with those for urban areas; people belonging to scheduled castes and scheduled tribes have much poorer health compared to those who belong to the upper castes; and children and women in India suffer grossly from the burden of disease and ill-health. Morbidity among women and children is endemic in India.

1.5 Importance of the Study

It is now well known that basic social services are the building blocks for human development and are treated as fundamental human rights. Every person must have his or her basic needs met. These basic needs include access to services such as food, education, health care and shelter. Without sacrificing these goals, the economy must remain efficient. It is only an efficient economy that can generate the surplus necessary to meet the socio-economic goals. We need, therefore, to stress simultaneously economic development in the conventional sense of accelerating growth rate and social development in the sense of securing for everyone the basic needs. To achieve higher levels of human development in our country, we need a pronged approach comprising of higher economic growth, a higher proportion of expenditure, particularly public expenditure on social sectors, and efficient utilization of the funds allocated etc. They must be weaved together to produce a coherent pattern of growth. There in lies the challenge of development.

Basic social services especially education and health are the critical inputs in human resource development and are essential for the economic growth of the country. Without health there is no question of education so both are very important and vice versa. In an increasingly competitive international economic environment, public expenditure in education and health becomes the indispensable instruments to help and maintain India's comparative advantage. Successful transitions from subsistence agriculture to modern agriculture, from basic industry to higher technology, from manufacturing to provision of services, all depend on the quality of human capital; and the quality of human capital depends to a large extent on public expenditures in the social sectors, including education, health, and nutrition. The major indicators of socio-economic development viz., the growth-rate of the economy, birth rate, death rate, infant mortality rate (IMR) and literacy rate are interconnected. For example health for women lead to a higher pace of population control and there is enough evidence even in India to show that a high literacy rate, especially in the case of women, correlates with low birth-rate, low IMR and increase in the rate of life-expectancy.

Public expenditures in education and health especially in basic education and basic health care, therefore, has a high rate of return – that is, the value of the benefits to the individual and to society exceed the cost of the expenditure by a large margin. Experiences also clearly demonstrate that expenditures in basic social sectors like education and health are prerequisite for the economic development. When there is continuous increase in the public expenditures in quality education at all levels together with development of appropriate skills for the workforce is a prerequisite for continuing

economic growth. So social service expenditure is clearly linked to key education and health sectoral outcomes. Public expenditures on basic social services benefit especially the lower income groups due to their lack of income to purchase health and education services. Particularly, investments in primary health care, public health, primary education and sanitation carry high positive externalities and justify government intervention to provide the services. Public expenditures on education and health are an essential part of public social spending because of their positive effects on the formation of human capital, which in turn contributes to economic growth, equity and the reduction of poverty. Therefore, the enhancement of the effectiveness of public expenditure is very important for future development of a country like India.

1.6 Objectives of the Study

The objective of this study is to examine the effectiveness of public expenditure of State Governments in India on social services. The present study is aimed at assessing the effectiveness of public expenditure on social sectors and primary education and health particularly. To this end, the specific objectives are:

1. Explore in depth the relationship across States between public expenditure and education, health outcomes in terms of both access and performance.

2. Identify the existing constraints to effective spending and suggest remedial measures.

3. Provide policy makers with a framework to analyze public expenditure and how it relates to education and health outcomes.

4. Understand from financing perspective, how Millennium Development goals has been achieved in India.

1.7 Scope of the Study

This study evaluates the effects of public expenditure on social services particularly education and health services in 15 States of India from the 1980s to the end of the 2008.

1.8 Significance of the Study

The results of the analysis could be used to benefit social service expenditure policy particularly in formulating long-term strategies. Public expenditure policy has been used as a vehicle for short-term economic solution for education and health shortage, as well as for long-term strategy for increasing population size to provide better economic development process and for tackling these social service problems. This thesis is significant in providing quantitative research on how public expenditure on social services can help India to improve their education and health outcomes.

1.9 Outline of the Thesis

The research work carried out in this study for the analysis of the effectiveness of public expenditure is brought out in six chapters. The organization of the chapters is as follows.

Chapter 1 present's a brief introduction covering the objectives, the problem, importance, significance, scope, objectives and outline of the thesis are discussed.

Chapter 2 reviews the literature covering, the theoretical and empirical studies relating to social services and welfare effects of public expenditure.

Chapter 3 analyses the growth performance of public expenditure on social services, GDP, per capita income. The trends analysis of education and health indicators are also discussed.

Chapter 4 develops and justifies a model to analyze social services with public expenditure and discuss the econometric issues confronted in order to determines the appropriate econometric techniques that should be applied to the panel data model, proposed tests, explain the appropriate data set in order to prepare for the analysis of the data and data sources.

Chapter 5 investigates whether possible relations between public expenditure and social services can be established.

Chapter 6 summarizes the findings and policy implications of the study, acknowledges the limitations of the study and suggests some further research directions.

CHAPTER 2

SOCIAL SERVICES AND PUBLIC EXPENDITURE: A REVIEW OF LITERATURE

2.1 Introduction

The purpose of this chapter is to explain the theoretical and empirical foundations on which this thesis is based, by reviewing the literature on the public expenditure and social services, public expenditure and education and public expenditure and health. In this chapter, special attention is paid to the work pertaining to public expenditure and its effect on social sectors particularly on education and health are reviewed. The review of literature covers various aspects of public expenditure and its effectiveness on social service sectors. The public expenditure is considered in the form of per capita expenditure, total expenditure as percentage of GDP, total, revenue and capital expenditure on social sectors, education and health. A number of studies were conducted by individuals and also government agencies both in India and also abroad on several aspects relating to public expenditure and social services (education and health). Considerable research effort has gone into analyzing the characteristics of expenditures. Different statistical models have been theoretically developed and empirically tested in analyzing the effectiveness of public expenditure on education and health. This chapter reviews some of the relevant studies in general about social services, education and health in particular are also reviewed.

To start with, section 2.1 provides introduction, section 2.2 provides the review of literature on the above argument for various countries. Section 2.3 concentrates the literature relating to India. Section 2.4 summaries the theoretical arguments developed in the chapter and conclusion.

2.2 International Studies

John C., and Andrewe E.O. (2007), they studied the impact of government expenditure on primary and secondary schools enrolment using OLS and least square dummy variable (LSDV) panel data models in African countries Nigeria and other SANE (South Africa, Algeria, Nigeria and Egypt) from 1990 to 2002. The results shows that the government expenditure on education has a positive and significant direct impact on primary and secondary education enrolment rates. Among the SANE, Nigeria has the greatest positive influence on increasing both primary and secondary education enrolment rates. The study finds that policy interventions, such as consolidating and sustaining democracy, accelerating national income, and international community fulfilling its aid promises to Africa, can also be helpful in moving African countries (including the SANE counties) toward the Millennium Development Goals (MDGs) and concluded that higher expenditure alone is not sufficient to achieve the MDGs or to attain higher quantum and quality of human capital.

Axel. Dreher et al., (2006), this paper empirically analyzed the impact of aid on education for 100 countries over the period 1970-2005. They estimated panel data

regressions both fixed and random effects equations to test whether and to what extent the impact of sector-specific aid on educational attainment depends on (i) the extent to which aid adds to overall educational expenditure of the recipient government, (ii) the strength of the link between government expenditure and education, (iii) the quality of institutions in the recipient country, and (iv) whether aid encourages institutional reforms. According to the results, aid significantly increases government expenditure which increases primary school enrolment. They concluded that the results showed that the impact of aid and expenditures remains positive and highly significant in the primary school educational attainment.

H. Issa and B. Ouattara (2005), the main concern of this study was to assess the impact of health expenditure on IMRs. The second objective was to examine the effect of three other variables (per capita income, female education and the cleanliness of the environment). The study tests the changing roles of public and private expenditures on health along the development process and argues that during the early development stages public expenditure is more effective than private expenditure, while as a country develops private expenditure becomes increasingly more effective and public expenditure gradually losses its importance. Using data for 160 countries for the period 1980-2000 and employing OLS and panel data techniques they found strong support for the above argument. The study found that public health expenditure was highly significant in the group of low-income countries whereby an increase in this expenditure by 1% increase would, on average, reduce infant mortality rates by 0.16%. However, they could not find evidence of such relationship in the group of high-income

countries. Their findings did not show any significant relationship between private expenditure on health and IMRs in the group of low-income countries. The high-income countries, found to be very strong that is a 1% increase in private health expenditure causes between 0.36% to 0.85% decreases in IMRs depending on the estimation technique. They concluded that the study found strong negative relationship between IMRs and public expenditure, private expenditure, per capita income and female education, measured by secondary level enrolment rates. However, they found weak relationship between the cleanliness of the environment, measured by CO2 emission rates, and IMRs.

Luiz de Mello and Mombert Hoppe (2005), studied the public spending on education and its effect on attainment of the students in Brazil. The indicators for education are taken as percentage of GDP, revenue expenditure and outcome indicators are enrolment rate, performance in reading literacy. From the analysis they concluded that enrolments in primary education and lower-secondary education had increased at remarkable pace. Despite the increase in enrolment rates student's performance remained low.

Patricia Justino (2005) makes a study of total expenditures on education and health in Vietnam for the periods 1994-2002 says that the government has consistently shown a strong commitment to social development. The share of government spending directed to social services has remained steady about 30 percent since 1994. In 2002 the largest component of social services was education (10.4%) followed by health (10.3%). He concluded that Vietnam is widely recognized as a success story among developing

countries owing the country's rapid rate of growth poverty reduction through higher spending on social services.

Baldacci, E. et. al., (2004), using panel data for 120 developing countries from 1975 to 2000, they explored the direct and indirect channels linking social spending, human capital, and growth in a system of equations. They found that both education and health spending have a positive and significant direct impact on the accumulation of education and health capital, and thus can lead to higher economic growth. They also found that policy interventions, such as improving governance, reducing excessive budget deficits, and taming inflation, can also be helpful in moving countries towards the Millennium Development Goals (MDGs). They concluded that higher spending alone is not sufficient to achieve the MDGs

Keiichi Ogawa (2004), addresses the issue of how public resources are employed efficiently and equitably in Zambia as a case study and to assess the efficiency and equitability of public resource usage in Zambia. He examined that public spending on education as a percentage of GDP linked with two educational outcomes measured by, first, school life expectancy and second, distribution of teachers in schools. The analysis between 1995 and 1998 shows that the school life expectancy in Zambia has shown a slight improvement from 7.8 to 7.9 years while spending on education, as a proportion of its GDP, has declined comparatively from 2.6 to 2.3 percentage points. As a whole, Zambia appears to have achieved quite a high level of coverage given the amount of public resources it mobilizes. Conclusion, public resources have not been

used efficiently and equitably for the allocation of resources if the allocation of teacher salaries had been examined. From the statistical results of this study, it is clear that there is a wide disparity of teacher-student ratio at the primary level across the country as well as among and within provinces.

Nigerian Institute of Social and Economic Research (NISER, 2004), the objective of the study was to examine the effectiveness of public expenditure of 36 State governments in Nigeria on social service sectors such as education and health. The primary analytical method used in this report was descriptive in nature. This includes frequency counts, ratios, proportional distributions and percentages. Growth rates were generated where necessary and averages computed. The analysis was supplemented with appropriate pictorial diagrams, bar, pie, line charts and histograms. The variables include budgeted and actual government expenditure by the various heads and output indicators such as total enrolment, proportion of students passing examinations, number of inpatients and out patients, number of doctors and nurses. It concluded that public spending which underlies the ineffectiveness of public services delivered by the States.

Lekha S. Chakraborty (2003), examined the impact of social sector public expenditure on human development across countries in a multivariate framework. Using fixed effects model of pooled least squares for the early 1990s, the analysis of link between per capita expenditure on health and education and Human Development Index (HDI) revealed that there is a positive functional relationship between the two. The per capita income, though found significant in determining human development, is

not a sole factor, which leads to human development. Also, the estimated coefficients of pooled least squares revealed that per capita spending on education and health has relatively stronger impact on human development than growth in per capita income per se. The same results were obtained when HDI is replaced for GDI in model specifications. This result is in confirmation with the trend that public expenditure on human capital formation gets transformed to the end results of better human development indicators and gender-sensitive indicators in particular, despite the constraints of intra-household disparities in resource allocation concluded that the public policy stance plays a crucial role in human development.

Dora. L. Costa (2003), assesses the effectiveness of government expenditure in improving health of the population from the past experience in USA. He has used health production function with OLS method to test whether death rate decline when local governments spends more on public health. He used individual level, city level and State-level data from 1910 to twentieth century for blacks and whites. The relative importance of the city spending to blacks and whites is mixed. In case of State level expenditure on public health lowered mortality rates. He concluded that from the estimates of the health gains from public expenditure provide a guide to the value of government services.

Karuna Gomanee et.al., (2003), they studied whether aid contributed to human development other than by increasing growth, in doing so, is aid more or less effective in poorer countries (those with low levels of aggregate welfare). They addresses these

issues, assessing if there is cross-country aggregate evidence for an effect of aid on welfare levels. They posit that aid can enhance human development by financing public expenditures that increase welfare indicators. Using quantile regressions, they reported evidence that aid was associated with higher human development (the Human Development Index) and lower infant mortality (both indicators of aggregate welfare). From the results there are differences across quantiles, aid was more effective in countries below the median of the welfare distribution, i.e. with lower levels of human development. In so far as aggregate welfare is (inversely) correlated with poverty, they found evidence that aid can make a positive contribution to alleviating poverty, and that the effect appears to be greater in countries with lower levels of human development indicators. The results are consistent with concluding that aid was most effective in improving welfare in the poorest countries. It would therefore seem that the lower the human development in the recipient economy, the more effective aid and social expenditure may be in promoting welfare. One possible explanation would be that the lower the welfare, the more room for improvement to be brought by aid and pro-poor spending hence the larger their impact. The estimates support their hypothesis that effectiveness of aid does vary across economies depending on where they are located in the welfare distribution.

Russel Wilderman (2003), analyses spending patterns in education for pre and post 1994 and examines the factors that weaken and strengthen efforts to build a Human Resources Development agenda in education in the provisions of South Africa. He also gives data for expenditure as percent of GDP, per capita expenditure, recurrent

expenditure and annual growth rates on education as total expenditure. In the period 1987-88 to 1991-2002, spending on education increased steadily as a proportion of gross domestic product. Spending on Education rose from 5.8 % in 1987-88 to 7.3 % in 1991-92. He concluded that public schools have been benefited. Although there is not one to one relationship between funding and education outputs, better funding of public schools increased the likelihood of greater number of learners in entering tertiary education.

Mohamed C., Diarra (2003) examines the trends and practices of the financial management of education in decentralized setting and highlights the strengthens and weaknesses of the Mali, Uganda, and Nigeria countries. The variables used are budgetary allocation *i.e.* total expenditure on training of teachers, provision of classrooms and the outcome indicator is enrolment rate and concluded that all three case studies make the case of decentralization (with or without sector wide approach) as a way of ensuring quality education. Even in the Nigerian case where decentralization seems to have impacted negatively on the quality of education, not decentralization per se is the reason of this counter performance but the way in which it is being implemented. Mali and Uganda seem to fare better. Nevertheless the studies show that despite some achievements, there is still a room for a lot of improvement as far as the financial management of education in a decentralized setting is concerned.

Andre C., Medici (2002), studied health financing in Brazil decentralization government, where the States and municipal governments played an important role in

financing the health care system. He used percentage of GDP, total expenditure both in States and municipals and outcome indicators are child mortality, efficiency of health information system. He took data from 1980s and 1990s. In the 1990s the public health expenditures in Brazil kept a relatively constant share of the public budget that is between 11% and 12%. The outcome indicators showed that there is a negative correlation between child mortality and the GDP per capita at the State level and there is direct correlation between health information systems. The reduction of child mortality is strongly correlated with the capability to achieve better health information system to prevent mortality. He concluded there is a significant relation between child mortality rate, health information systems and public expenditure.

Santosh Melhotra and Enrique Delamonica (2002), the objective of this study was to ascertain the importance of public spending to promote and achieve child well-being, a critical dimension of human development as it becomes crucial to measure and monitor the allocation of resources to basic social services (BSS)-services which directly improve children's lives such as basic health, primary education, nutrition, water and sanitation, and reproductive health. The analysis shows that total public expenditure on health and education as a percent of GDP in Industrial countries as an average is 40 percent where as in developing countries rarely exceeds 25%. No industrial country spent less than 5% of GDP on government expenditure on health, where as hardly any developing country has as share of public spending on health and also same as in education. In case of per-capita also the countries vary from an average between 12 and 14%. Higher achiever countries in outcomes did indeed have a higher level of public

spending on the package of basic services than other developing countries. Thus, the relatively good results and progress in school enrolments and child survival in countries like Namibia, Sri Lanka, and Uganda (especially in education) are not surprising, given their expenditure patterns. The importance of efficiently spending these resources is highlighted by cases such as Niger and Peru; with relatively high allocations and not particularly impressive results for children's well-being, there are many possible sources of inefficiency. Finally, low expenditure countries like Cameroon, Philippines, Nicaragua, and Zambia experience relatively disappointing outcomes, especially given their levels of income, in terms of child mortality and education. Data on the use of education services by different groups' from 19 countries shows inequities in the distribution of total spending on education. Where net enrolment at primary level is less than 70%, the poorest 20% of the population receive less than 20% of the benefits of public spending on education. Bangladesh, the rich quintiles of the population receives 39% of the benefits, the poorest receives 14%. In case of health also inequity benefits poor and rich also affect the outcomes results like high child morality rate more than 140 per 1000 birth in poor countries. They concluded that public spending for social services at low levels in developing countries lacks locative efficiency and equity distribution of public spending further undermines its impact in the well being of children and poor.

Jung and Thorbecke (2001), found that an increase in public expenditure on education contributes to economic growth and poverty alleviation in Zambia and Tanzania. From the equity aspects, public resources in primary education in many sub-Saharan African

countries are equally targeted to poor students but not for higher levels of education (Castro-Leal et al. 1999). Compared to other sub-Saharan African countries, the share of public education expenditure in Zambia is smaller even though its public resources are employed more efficiently than other sub-Saharan African countries. However, these public resources have not been used efficiently and equitably for the allocation of resources if the allocation of teachers had been examined. From the statistical results of this study, it is clear that there was a wide disparity of teacher-student ratio at the primary level across the country as well as among and within provinces. A standardized management approach to re-allocate the resources in teachers should be adopted for policy implementation in order to distribute public resources efficiently and equitably, and thus to increase access to schooling as well as to improve student promotion.

John Quiggin (2001), focused on the impact of changes in public expenditure on health and education services in the Australia. From the study he found that Australia's total expenditure on health care has remained roughly constant at around 8% of gross domestic product (GDP) for the past two decades, comparable to most other developed countries. The mixture of public and private contributions has also remained broadly constant. The pressure to cut expenditure has been offset by steadily increasing demand for health services, leading to a situation of chronic near-crisis, manifested in long waiting lists and public dissatisfaction. With respect to education *i.e.* the quality of education services available to children from low-income families has deteriorated as a result of cuts in public expenditure. This has been reflected in declining rates of school completion. The experience of South Australia provides a particularly striking

example. Until the early 1990s, South Australia's performance on this criterion was strong. South Australia had a higher apparent retention rate than any other Australian State. Expenditure cuts introduced in 1994 had severe impact on educational services and an almost immediate impact on educational outcomes. From July 1994 to December 1995 teaching staff positions in public schools were reduced by 1100 and non-teaching by 110. Over the same period, school retention rates dropped at a rate not equaled in any other Australian State, though the pattern elsewhere was broadly similar. In only two years, the school completion rate dropped by 10 percentage points, from 81.5 percent to 71.6 percent. The completion rate for boys in South Australian government schools has fallen to 51 percent, a return to the outcomes of the 1970s. He concluded from the analysis that cut in public spending affects the education and health outcome indicators.

Rogers Dhliwayo (2001), studied the situation of basic services health and education under ESAP and examined the impact on various sectors of the population from the resulting changes in social welfare. The methodology to address these issues at hand consist of review of available literature on structural adjustment programmes, studies on the impact of public expenditure on health and education, data performance of aggregate public spending and social spending in Zimbabwe during the period of 1980s and 1990s. The study analysis showed that the government expenditure on health increased throughout the 1980s as government embarked on an expansion of health care to poor. But when the ESAP was introduced in 1990s the government expenditure reduced. He concluded that macroeconomic policies are the major determinant of

health and education sectors performance. The health and education sectors performance were impeccable in the 1980s due to supportive macroeconomic policies. However, the introduction of ESAP in the 1990s has resulted into social sectors operating under severe stress. Budget cuts, decline in real wages, increase in poverty levels, cost recovery and increases in HIV/AIDS have resulted in a decline in social indicators.

Eva Liu and Yue S.Y (1999), studied the health expenditure in Singapore for the years 1960, 1970, 1980 and the period 1988-1995. They considered expenditure variables as GDP, population, per capita expenditure; total health care expenditure and health indicators are expectancy of life at birth, infant mortality rate, and crude death rate. They noticed from the study that there is no particular correlation between GDP growth and growth in health care expenditure. As a percentage of GDP, public expenditure on health care started to decrease in 1986. It dropped from 1.05% in 1986 to below 1% since 1988. The growth of public expenditure outpaced economic growth in three years *i.e*. 1991, 1992, & 1995. Most of the expenditure on health is made by private sector *i.e.* 80%. Even though Singapore's health care expenditure has remained at low level, the health conditions of Singaporeans has been improving since 1987. Infant mortality rate has dropped significantly from 7.4 per 1000 lives births in 1987 to 3.8 per 1000 live births in 1996. Crude death rate has been low at around 4.7 to 4.9 per 1000 resident population and concluded Singapore had a good outcome of health despite low level of expenditure.

2.3 Indian Studies

Sonia Bhalotra (2006), the study investigated the impact of public expenditure on childhood mortality in India. It also investigated to what extent this impact is delivered *via* changes in public health expenditures. The study merged demographic data at the individual- level with a panel of State-level data on GDP and other macroeconomic and political variables. The data contain almost 200,000 children born across 15 States and period of 30 years. The results suggested a growth elasticity of under-5 mortality of -0.6. The study concluded that public health expenditure only has a beneficial effect on mortality at high levels of expenditure and have contributed significantly to mortality decline and to the convergence of mortality rates across the Indian States.

Jos Mooji and Mahendra Dev. S. (2002), examined the trends in social sector expenditures both in Center and States combined, inter- state variations for the period early 1990s and late 1990s. The variables taken are as GDP or GSDP as percentage of total expenditure, and per capita expenditure. They noticed that there had been decline in States share in expenditure from 85 percent in 1990-91 to 80 percent in 1998-99. In spite, of the decline, States share is large than the Centre. Throughout the 1990s social sector expenditure in terms of percentage of GDP, was lower than that in the late 1990s. As percentage of aggregate expenditure increased from 25 percent to 28 percent and per capita expenditure also increased continuously after 1993-94. They concluded that the Center had done better than the States in the post reform period. With regard to education, the share of education as a percentage of GDP declined from around 4.1 percent in 1990-91 to 3.8 percent in 1998-99. In most States social services expenditure

has not increased very much in the first half of the 1990s, but in second half there has been an increase in terms of per capita expenditure. In the inter-state variations the rich and middle-income States have done better than poor States, but there are huge variations. Goa spending highest followed by West Bengal. The performance of Madhya Pradesh, Orissa and Rajasthan has increased especially after the mid 1990s. The States Bihar, Uttar Pradesh and West Bengal are worry because both levels and growth of expenditure on social services are comparatively low.

Vathsala Ramji, et. al. (2001), reviewed some of the studies on comparing the pre and post reform period on education expenditure of the Indian States. Tulsidhar (1997), P.R. Panchamukhi and Guhan (1996), The National Policy on Education (1986), Abu Saleh Shariff and P.K. Ghosh and concluded that the social sector expenditure as a whole has declined considerably during the first few years of reforms. The per capita expenditure on social services, including education, health, housing and urban development and social welfare, for all States together was lower in the post reform period as compared to 1990-91. Reviewing the social sectors expenditures of the States in the pre-reform and during reform periods noted that the expenditure shares of social sector in total revenue expenditure showed declining trend in education expenditures for all States, they observed decreased from 21.08 percent (pre reform) to 19.70 percent of total revenue expenditure (during the reform period).

Bajitha Bajir (2000), had made a pioneering study of the trends in expenditure on education as a whole and elementary education in particular, by the Central

government. The Fifteen States were selected, where funds were received through District Primary Education Programs. The objective of the study was (a) to examine the growth of actual expenditure on education and elementary education. This study was examined on the basis of secondary data using revenue account expenditure as a percentage of GDP and per capita expenditure. He considered literacy rate, enrolment rate as the outcomes indicators and comes to the conclusion that there are clearly some differences between States on the level, growth and composition of expenditure for elementary education. On the whole, the group of educationally backward States fares worse on most expenditure indicators with two notable exceptions – Orissa and Rajasthan. Among the other States (leaving out Tamil Nadu and Kerala which have to address different range of problems), the ranking on expenditure indicators is much higher, with Assam performing the best. The two exceptions here are West Bengal and Haryana. Their rankings are relative. When judged against the requirements for ensuring universal access and retention at the elementary level, the progress is moderate in three States, slow in a large number of States and faltering if not negligible in others, especially the more populous, educationally backward States. In short, there has not been a radical shift in public spending by State governments for elementary education. Clearly, almost all the States are far from reaching the goal of UEE, and the substantial increase in public expenditure is required. A preliminary examination of existing levels of spending, unit costs and overall fiscal viability indicates that a combination of resource constraints, cost constraints and imbalances in State Finances exist for all States. However, the situation appears especially serious in Uttar Pradesh, Bihar and West Bengal where the fiscal imbalances are unsustainable.

Basanta K. Pradhan and Shalabh Kumar Singh (2000), tried to see whether there is any link between the rate of growth of expenditure during 1991-92 and 1993-94 and the change in educational outcome between 1992 and 1996. They looked at the influence of average spending per child over the period 1985-86 to 1993-94 on educational outcomes in 1996 for 16 major states. The indicators they used are enrolment ratio and dropout rate for educational achievements, pupil-teacher ratio, along with the number of schools per 100 sq. km, for the level and quality of educational services. They concluded that the importance of public expenditure couldn't be gained particularly in retained children in school and improving the quality of services. Public expenditure per child and the rate of growth of expenditure did not seem to have a strong influence on the rate of enrolment for 16 major states of India.

2.4 Conclusion

Review of literature showed that education and health plays a vital role in the overall development in a country. Investment in education and health becomes a necessary condition for economic and social transformation. Also, we intended to search for evidences to support the notion advocated in Chapter 2 that public expenditure on social services is necessary.

CHAPTER 3

PUBLIC EXPENDITURE ON HUMAN DEVELOPMENT

3.1 Introduction

The importance of higher levels of social services for human development and economic growth is well known. In other words, social-sector development has both intrinsic and instrumental value. A lot has been achieved in the social sector in the second half of the twentieth century. Nevertheless, the performance of India in the social sector is far from satisfactory, and could have been much better. Social sector development depends on expenditures and effective implementation. Of course, economic growth is important for several reasons. More resources will be available for further investments and social development. It will also create better opportunities for the population if the growth is labour-intensive. The East Asian countries had higher growth with labour absorption. Also, the successful countries in terms of growth had better initial conditions in terms of equity. Therefore, the links among incomes, distribution and social development are strong (Jain and Indira; 2000).

In chapter 2, we reviewed the literature which holds the novel view that public expenditure complements social services to a certain extent. The importance of public expenditure in the process of human development is well recognised. This chapter examines the trends and pattern of public expenditure on human development in the

15 major States of India and attempts to explain these trends in view of overall changes in the fiscal situation of the States. The chapter also presents a comparative analysis of the level of public spending on human development in the Indian States. The chapter further examines in detail the composition of public expenditure in sectors that are important for human development. An analysis of achieving human development outcomes will be added to the chapter later.

Section 3.2 provides the constitutional provisions and budgetary heads or social services: Section 3.3 a frame work analysis for the level and composition of public expenditure in the social service sector; Education and Health sectors; Section 3.4 discusses the trends analysis of outcome indicators of education and health sectors. Section 3.5 discusses Conclusions.

3.2 The Constitutional Provisions and Budgetary Heads

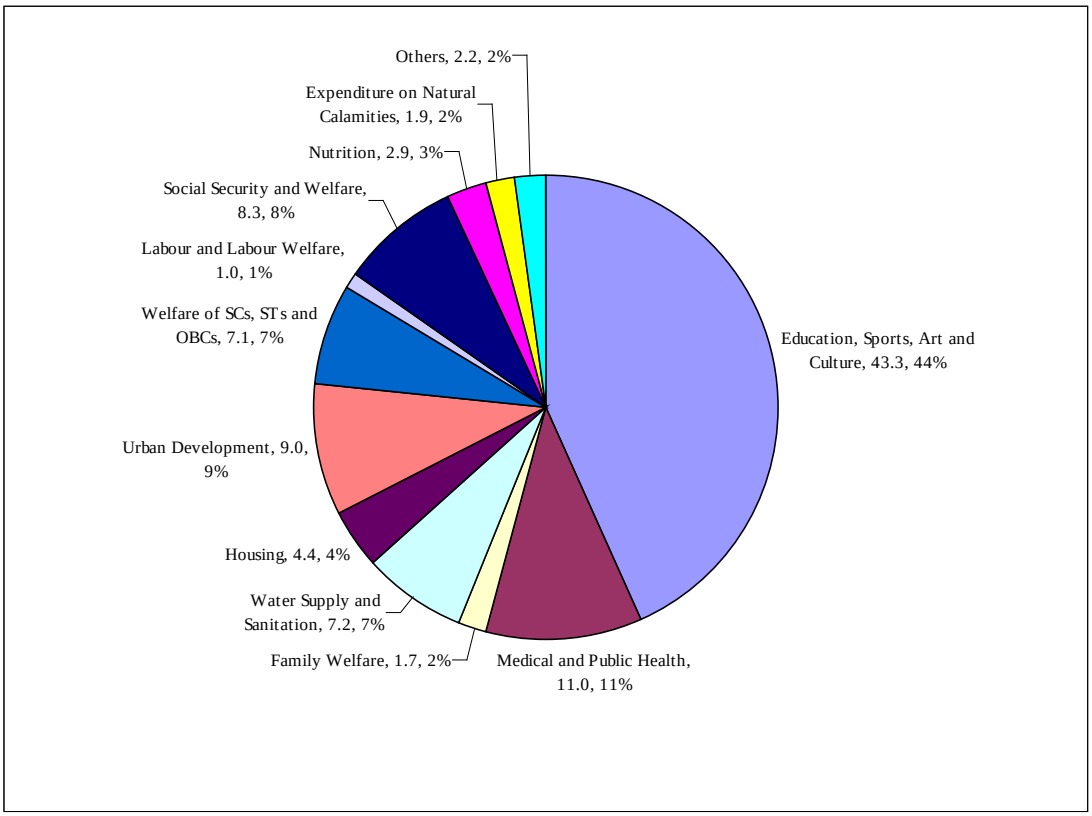
The total combined expenditure on social and community services by both Centre and State governments is about Rs.3, 57,381 crore in 2008-09 (BE) which forms about 24.1 percent of total expenditure and 6.72 percent of GDP. The 7th Schedule of the Indian Constitution demarcates the functions of the Union and State governments. Public health, water supply, drainage, sanitation, hospitals and dispensaries are in the state list (Items 6 and 17 of List II) while education including technical education, medical education and universities are to be in the Concurrent List (List III). Central Government expenditure on social services and rural development has gone up consistently over the years. The share of Central Government expenditure on social

services including rural development in total expenditure (plan and non-plan) has increased from 11.23 percent in 2002-03 to 19.44 percent in 2008-09 (RE). Central support for social programmes has continued to expand in various forms although most social sector subjects fall within the purview of the States. Major programme specific funding is available to the states through the Centrally-sponsored schemes. In 1990-91 the shares of the States for the total social sector expenditure were around 85 percent, where as in 2008-09, the share of the total social sector expenditure declined to 79.68 percent. In spite of the decline, the contribution of the States to total social sector expenditure is still substantial and much larger than that of the center. In absolute figures, in 2008-09 (BE) India spent Rs. 3,57,381 crore on social services and rural development. Out of this, the States spent Rs. 284771.82 crore. So it is important to study the social sector expenditure of the States which they provide the best picture of State's commitment towards the social sectors. As mentioned above, the main responsibility for social sector expenditure lies with the States. Thus it is important to take a closer look at the budget when assessing the performance of social services delivery at the State-level.

Expenditure on social services by the General Government (Centre and States combined) has shown increase in recent years reflecting higher priority to social services. Expenditure on social services as a proportion of total expenditure increased from 19.3 percent in 2003-04 to 21.6 percent in 2006-07 and further to 22.4 percent in 2007-08 (RE) and 24.1 percent in 2008-09 (BE). Expenditure on education as a proportion of total expenditure has increased from 9.5 percent in 2003-04 to 10.8

percent in 2008-09 (BE). Share of health in total expenditure has also increased from 4.3 percent in 2003-04 to 5.1 percent in 2008-09 (BE). The Government in recent years has increased its outlays in the social sectors.

Figure 3.1 Significance of government expenditure on social services in India



Source: Budget Documents of the State Governments. 2008-09

The shares of expenditure on education and health, which constituted around 52.1 percent and 13.4 percent respectively, of States' expenditure on social services during 1990- 91 to 2004-05, have shown a declining trend and are budgeted at the level of 43.3 and 11.0 percent respectively, during 2008-09. (Figure: 3.1)

3.3 Overall Pattern of Public Expenditure in the Social Service, Education and Health sectors.

An important public policy instrument for economic and social development of a State is the level of government expenditure. In the Indian context public expenditure could be by the Central or the State government. The present discussion is restricted to an analysis of the expenditure of the State governments and a comparative analysis of the emerging trends in 15 major States in respect of a few key parameters which have an intrinsic bearing on social and economic development. The variables chosen for examination include those which will have a bearing on gender and equity issues. The 15 States of India together account 96 percent of the population. The remaining 4 percent of the population is spread in 10 smaller States and seven Union Territories (UTs) including the national capital Delhi. Leaving out these States and UTs from detailed study is mainly due to non-availability of all relevant data and also to keep the data sets analytically and logistically manageable. The 15 States taken up for the detailed study has been grouped into two – a forward group and a backward group. The forward group consists of Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, Maharastra, Punjab and Tamil Nadu. The backward group comprises of Assam, Bihar, Madhya Pradesh, Orissa, Rajasthan, Uttar Pradesh and West Bengal. Assam could be included in this low income group; it is special category State which is given favorable terms and conditions or fiscal transfers from Central government

The extent of public expenditure on human development has been measured in earlier studies such as ratios used by UNDP's Human Development Report 1991 to indicate

the priority assigned by States to expenditure on human development. Based on this above ratio the study also used the trends in growth rates, per capita expenditure on social and human priority sectors to measure public spending for human development. Based on the above concepts we used the trends analysis in social service sectors, education and health expenditures for the 15 States for the period 1980-81 to 2007-08 are explained in the following major heads. (a) Growth rates for total, revenue and capital expenditures (b) Ratio to GSDP and (c) Ratio to the total expenditure (d) ratio to social sector (Education and Health) and (e) Per capita expenditures.

The first step towards such an analysis is to define what constitutes social sector and the human priority areas. In this study, Social Services include following subheads: (i) Education, Sports, Art and Culture; (ii) Medical and Public Health; (iii) Family Welfare; (iv) Water Supply and Sanitation; (v) Housing; (vi) Urban Development; (vii) Welfare of Scheduled Castes, Scheduled Tribes and Other Backward Castes; (viii) Labour and Labour Welfare; (viii) Social Security and Welfare; (ix) Nutrition; (x) Relief on Account of Natural Calamities; (x) Other Social Services. Education includes (1) Education, Sport, Art and Culture and Health includes Medical, and Public Health. These are the sectors that are particularly important for human development.

The expenditure data is mainly based on the Finance Accounts of the States. It uses data from budget documents of States for detailed analysis of expenditure under

different heads. It also uses information from the Annual Financial Statement and Budget At a Glance published by the Finance Department, Government of the States as well as data released by the Twelfth Finance Commission.

3.3.1 Public Expenditure Analysis in the Social Service Sectors

The Governments, both at the Centre and State, have been increasingly providing public goods in crucial areas such as education, health, sanitation, housing, etc. In this study we discuss the following sections (3.3.1.1 to 3.3.1.4) regarding social service expenditure of the States.

3.3.1.1 Growth Rates

In the pre-liberalization period of revenue expenditure was higher than the post – liberalization period in the most of the States except Kerala, Orissa and West Bengal (Table 3.1). In case of capital expenditure states like Assam, Bihar, Madhya Pradesh, West Bengal showed decreased trend where as Andhra Pradesh, Gujarat, Haryana, Kerala, Karnataka, Tamil Nadu showed increased trend. When we seen the total expenditure Andhra Pradesh, Assam, Bihar, Haryana, Karnataka, Madhya Pradesh, Maharastra, Punjab, Rajasthan, Tamil Nadu and Uttar Pradesh showed a declined trend from pre-liberalisation to post-liberalization except Gujarat, Orissa, Kerala, and West Bengal. The increasing trend of revenue, capital and total expenditure is observed only in Kerala State and most of the States experienced declining expenditures. This can also be seen easily from the (Table 3.1). States in which the government expenditure on social services has been growing at faster rate are Gujarat

(17.32%), Maharastra (16.25%), Rajasthan (15.83%), Andhra Pradesh (15.00%), and Haryana (15.49%). States with low growth rates are seen in Uttar Pradesh (12.14%), Bihar (10.98%), Assam (12.45%), etc. Thus in general, the growth is higher in richer States and slower in poorer States.

Table 3.1 Total Government Expenditure on Social Services - Annual Compound Growth Rate (%)

S.No.	States/Year	80s			90s			80s and 90s together		
		Rev exp	Cap exp	Total exp	Rev exp	Cap exp	Total exp	Rev exp	Cap exp	Total exp
1	Andhra Pradesh	14.92	11.40	14.84	13.19	17.07	13.28	15.30	17.42	15.00
2	Assam	15.16	14.08	15.11	11.88	05.35	11.69	12.63	04.7	12.45
3	Bihar	14.29	13.50	14.23	10.76	03.35	10.58	11.20	04.26	10.98
4	Gujarat	14.77	06.49	14.32	14.28	25.26	14.92	16.62	26.97	17.32
5	Haryana	15.99	07.47	15.64	13.21	21.02	13.59	15.23	20.29	15.49
6	Karnataka	15.70	12.10	15.65	13.53	35.86	14.13	14.48	34.99	15.11
7	Kerala	12.15	01.08	11.70	12.70	06.48	12.57	13.99	08.60	13.88
8	Madhya Pradesh	15.47	19.66	15.62	12.76	05.29	12.43	13.49	06.72	13.23
9	Maharashtra	15.53	11.66	15.43	13.99	10.82	13.93	16.32	11.26	16.25
10	Orissa	12.56	14.2	12.64	17.07	01.06	16.63	15.55	05.98	15.26
11	Punjab	14.36	11.07	14.20	11.64	08.77	11.59	13.96	00.16	13.39
12	Rajasthan	15.49	14.76	15.41	14.02	12.00	13.86	15.90	15.02	15.83
13	Tamil Nadu	16.83	07.06	16.53	11.86	18.57	12.03	12.72	23.50	13.11
14	Uttar Pradesh	15.56	12.50	15.48	09.99	06.89	09.89	12.27	08.44	12.14
15	West Bengal	12.12	25.58	12.42	13.51	11.48	13.46	15.31	12.88	15.25

Source: Finance Accounts of respective states

3.3.1.2 Ratio to GSDP

Table 3.2.Total Government Expenditure on Social Service Sector as ratio of GSDP (%)

S.No	States/Year	1980-81	1990-91	2000-01	2005-06
1	**Andhra Pradesh**	0.06	0.06	0.06	0.05
2	**Assam**	0.07	0.08	0.09	0.07
3	**Bihar**	0.06	0.07	0.11	0.09
4	**Gujarat**	0.05	0.06	0.08	0.05
5	**Haryana**	0.04	0.05	0.05	0.04
6	**Karnataka**	0.05	0.06	0.06	0.06
7	**Kerala**	0.07	0.08	0.06	0.05
8	**Madhya Pradesh**	0.04	0.06	0.08	0.06
9	**Maharastra**	0.04	0.05	0.06	0.05
10	**Orissa**	0.06	0.08	0.09	0.06
11	**Punjab**	0.05	0.05	0.05	0.04
12	**Rajasthan**	0.06	0.07	0.09	0.08
13	**Tamil Nadu**	0.05	0.07	0.06	0.06
14	**Uttar Pradesh**	0.04	0.06	0.06	0.06
15	**West Bengal**	0.05	0.06	0.06	0.04

Source: Finance Accounts and Budgets Documents of State Governments for 2008-09.

The relative magnitude of social service expenditure to GSDP from 1980-81 to 2005-06 is given in the Table 3.2. It is significant that ratio of social service expenditure to GSDP for all the States taken together has come down steeply. In 2005-06 as compared to 1980-81, the relative importance of social service has come down as far as the State governments are concerned. We can see that the ratio is better in poorer States than the forward States.

3.3.1.3 Ratio to Total Expenditure

Table 3.3 Total Government Expenditure on Social Service Sector as ratio of Total Expenditure (%)

S.No.	States/Year	1980-81	1991-92	2001-02	2006-07
1	Andhra Pradesh	0.36	0.37	0.32	0.30
2	Assam	0.40	0.38	0.42	0.36
3	Bihar	0.38	0.38	0.34	0.33
4	Gujarat	0.37	0.34	0.35	0.33
5	Haryana	0.30	0.32	0.31	0.28
6	Karnataka	0.31	0.35	0.36	0.29
7	Kerala	0.47	0.43	0.34	0.30
8	Madhya Pradesh	0.30	0.37	0.38	0.30
9	Maharastra	0.30	0.34	0.36	0.34
10	Orissa	0.34	0.32	0.34	0.32
11	Punjab	0.40	0.35	0.24	0.21
12	Rajasthan	0.35	0.41	0.41	0.38
13	Tamil Nadu	0.37	0.44	0.37	0.32
14	Uttar Pradesh	0.32	0.34	0.29	0.31
15	West Bengal	0.46	0.44	0.38	0.33

Source: Finance Accounts

As regards, the ratio to respective total expenditure, again there is clear cut demarcation between the forward and poorer States. Thus the ratio for forward States is less than the poorer States which is clearly seen in the Table 3.3. The trend analysis showed that the share of social services as ratio of total public expenditure has reduced during the period of 25 years.

3.3.1.4 Per Capita Expenditure on Social Services

Table 3.4 Per Capita Expenditure on Social Service Sector (Rupees.)

S.No	States/Year	1980-81	1990-91	2000-01	2007-08 (RE)
1	**Andhra Pradesh**	94.25	328.09	1,099.47	3505
2	**Assam**	86.08	360.58	1,088.89	4759
3	**Bihar**	65.64	319.29	601.39	1465
4	**Gujarat**	118.81	414.5	1,745.95	2572
5	**Haryana**	115.38	410.56	1,283.35	3177
6	**Karnataka**	89.44	355.54	1,253.11	3104
7	**Kerala**	146.75	451.3	1,349.21	2861
8	**Madhya Pradesh**	74.14	407.14	1,000.99	1923
9	**Maharastra**	110.91	406.08	1,545.49	2961
10	**Orissa**	95.91	277.25	900.62	2133
11	**Punjab**	148.59	465.26	1,299.77	2384
12	**Rajasthan**	89.49	366.82	1,200.88	2390
13	**Tamil Nadu**	94.84	457.76	1,369.91	3235
14	**Uttar Pradesh**	65.37	271.55	599.88	1670
15	**West Bengal**	102.09	348.76	1,098.55	1933

Source: Finance Accounts and Budgets Documents of State Governments for 2008-09.

Two features stand out prominently; first, there is a clear cut difference between the developed States and poorer States. The per capita expenditure on social service is relatively high in developed States than in the poorer States. Table 3.4 clearly brings this out. Forward States like Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala, Maharastra and Tamil Nadu showed more than Rs. 2500 except Punjab with Rs 2384 while backward group States such as Bihar, Madhya Pradesh, Orissa, Uttar Pradesh West Bengal ended up with less than Rs. 2500 except Assam with Rs. 4759. Second it

is higher in more developed States than the poorer States. This trend can be seen easily from the Table.

3.3.2 Analysis of Public Expenditure on Education

Public expenditure analysis is being increasingly used for assessing public service delivery performance. It constitutes a useful tool to assess the efficiency and equity of public spending in the education sector. As such, it provides an important insight when analysts consider the rationale for government intervention in education. Thus it is important to take a closer look at the budget when assessing the performance of education services delivery in the following sub-sections.

3.3.2.1 Growth Rates

The annual growth rate of government expenditure on education for 15 States is shown in the Table 3.5. The growth rates are shown for the periods 1980s, 1990s, and 1980-2006 for Total Expenditure, Revenue Expenditure and Capital Expenditure. The growth rate showed that the total expenditure on education is higher in 1980s than 1990s except Haryana, Kerala, Orissa, and Punjab. In case of revenue expenditure on education States like Haryana Kerala, Orissa and Punjab showed an increased trend where as in capital expenditure on education Karnataka and Tamil Nadu showed an increased trend. Altogether for two decades the growth rates showed highest in Punjab followed by Haryana and remaining States showed below 18% of growth rate.

Table 3.5 Total Government Expenditure on Education-Annual Compound Growth rate (%)										
S.No.	**States/Year**	**80s**			**90s**			**80s and 90s together**		
		Rev exp	**Cap exp**	**Total exp**	**Rev exp**	**Cap exp**	**Total exp**	**Rev exp**	**Cap exp**	**Total exp**
1	**Andhra Pradesh**	16.65	30.24	16.72	12.57	2.02	12.53	15.6	-5.86	15.54
2	**Assam**	15.26	15.14	15.25	13.98	6.74	13.91	14.45	3.37	14.39
3	**Bihar**	16.09	58.18	16.65	11.63	-27.03	11.55	11.87	8.43	11.88
4	**Gujarat**	26.16	24	26.15	13.92	17.24	13.93	15.59	9.17	15.55
5	**Haryana**	-14.57	14.44	-11.6	55.19	8.46	49.69	47.95	-1.7	41.58
6	**Karnataka**	15.84	5.05	15.79	14.1	23.52	14.13	15.46	20.42	15.57
7	**Kerala**	11.61	7.77	11.56	12.9	-1.87	12.69	13.55	-0.74	13.34
8	**Madhya Pradesh**	15.8	34.49	16.09	12.75	-3.82	12.24	22.77	-5.96	20.3
9	**Maharashtra**	67.19	13.84	65.93	15.69	16.12	15.69	17.39	13.8	17.39
10	**Orissa**	12.61	32.27	13.26	21.67	-1.54	21.28	18.12	0.62	17.89
11	**Punjab**	-14.95	17.07	-13.45	55	3.31	51.72	59.14	-21.0	50.32
12	**Rajasthan**	16.56	39.97	16.9	14.35	0.03	14.14	15.97	7.08	15.85
13	**Tamil Nadu**	17.04	9.29	16.93	12.98	20.86	13.05	14.11	20.69	14.19
14	**Uttar Pradesh**	18.85	24.3	18.89	10.51	-4.33	10.38	13.01	-1.81	12.83
15	**West Bengal**	18.49	16.36	18.47	13.76	10.21	13.74	14.46	14.44	14.46
Source: Finance Accounts										

3.3.2.2 Ratio to GSDP

The Inter-State analysis of government on education as ratio to GSDP of major 15 States in different years 1980-81, 1990-91, 2000-01 and 2005-06 is given in Table 3.6. From the data we conclude that there is an increasing trend in education expenditure ratio to GSDP in the States like Assam, Bihar, Maharastra, Orissa,

Rajasthan, Uttar Pradesh and West Bengal while other States the trend is fluctuating till 2000-01. Again our observations reveals that in 2005-06 all States showed decreasing trend except Madhya Pradesh and the share of public expenditure on education to the GSDP ranged between 2% to 4% only. The public education expenditure as ratio to GSDP is higher in poorer States.

Table 3.6 Public Expenditure on Education as ratio of GSDP (%)

S No.	States/Year	1980-81	1990-91	2000-01	2005-06
1	**Andhra Pradesh**	0.03	0.03	0.03	0.02
2	**Assam**	0.04	0.04	0.06	0.04
3	**Bihar**	0.03	0.05	0.07	0.06
4	**Gujarat**	0.01	0.03	0.03	0.02
5	**Haryana**	0.02	0.00	0.02	0.02
6	**Karnataka**	0.02	0.03	0.03	0.03
7	**Kerala**	0.04	0.05	0.04	0.03
8	**Madhya Pradesh**	0.02	0.03	0.02	0.03
9	**Maharastra**	0.00	0.03	0.04	0.02
10	**Orissa**	0.02	0.02	0.05	0.03
11	**Punjab**	0.03	0.00	0.03	0.02
12	**Rajasthan**	0.03	0.03	0.04	0.04
13	**Tamil Nadu**	0.03	0.04	0.03	0.02
14	**Uttar Pradesh**	0.02	0.03	0.04	0.03
15	**West Bengal**	0.02	0.04	0.03	0.02

Source: Finance Accounts

3.3.2.3 Ratio to Total Expenditure

Table 3.7 Public Expenditure on Education as ratio of Total Expenditure (%)

S.No.	States/Year	1980-81	1991-92	2001-02	2006-07
1	**Andhra Pradesh**	0.16	0.17	0.15	0.12
2	**Assam**	0.22	0.21	0.28	0.21
3	**Bihar**	0.19	0.24	0.23	0.21
4	**Gujarat**	0.07	0.18	0.15	0.13
5	**Haryana**	0.14	0.01	0.15	0.12
6	**Karnataka**	0.16	0.17	0.19	0.14
7	**Kerala**	0.27	0.26	0.21	0.18
8	**Madhya Pradesh**	0.13	0.18	0.09	0.14
9	**Maharashtra**	0.01	0.18	0.23	0.17
10	**Orissa**	0.11	0.10	0.18	0.14
11	**Punjab**	0.22	0.01	0.14	0.11
12	**Rajasthan**	0.17	0.21	0.20	0.17
13	**Tamil Nadu**	0.18	0.22	0.19	0.14
14	**Uttar Pradesh**	0.15	0.20	0.18	0.16
15	**West Bengal**	0.14	0.25	0.20	0.17

Source: Finance Accounts

Looking at the ratio of public expenditure on education in total expenditure, it stood at around 15 percent for all 15 States during the 25 years but the difference between the states with the highest and lowest shares declined from 26 percent in 1980-81 to 10 percent in 2006-07 (Table 3.7). Traditionally high expenditure States such as Andhra Pradesh, Kerala West Bengal Punjab, reduced their expenditure in 2000-01. On the other hand, the lowest income States increased their expenditure which was catching up with other States (Uttar Pradesh and Bihar). The share of public expenditure on education in total expenditure increased in poorer States.

3.3.2.4 Ratio to Social Services

Table 3.8 Public Expenditure on Education as ratio of Social Services (%)					
S.No.	**States/Years**	**1980-81**	**1990-91**	**2000-01**	**2006-07**
1	**Andhra Pradesh**	0.44	0.47	0.45	0.39
2	**Assam**	0.56	0.56	0.67	0.59
3	**Bihar**	0.51	0.63	0.66	0.63
4	**Gujarat**	0.20	0.54	0.42	0.41
5	**Haryana**	0.49	0.03	0.49	0.44
6	**Karnataka**	0.50	0.50	0.53	0.47
7	**Kerala**	0.58	0.60	0.61	0.60
8	**Madhya Pradesh**	0.44	0.48	0.24	0.45
9	**Maharashtra**	0.03	0.52	0.63	0.51
10	**Orissa**	0.31	0.32	0.53	0.46
11	**Punjab**	0.56	0.03	0.59	0.52
12	**Rajasthan**	0.47	0.51	0.48	0.44
13	**Tamil Nadu**	0.49	0.50	0.52	0.44
14	**Uttar Pradesh**	0.46	0.59	0.62	0.51
15	**West Bengal**	0.32	0.57	0.52	0.53
Source: Finance Accounts					

Table 3.8 shows public expenditure on education as a share of social service expenditures. The expenditure in all the States ranged from 20% to 67% over the 25 years. Expenditure in the highest income States remain high through out the 20 years except Haryana and Punjab.

3.3.2.5. Per Capita Expenditure on Education

Table 3.9 Per Capita Public Expenditure on Education (Rs.)					
S No.	**States/years**	**1980-81**	**1990-91**	**2000-01**	**2006-07**
1	**Andhra Pradesh**	41.02	152.64	490.79	760.10
2	**Assam**	48.35	200.24	729.12	948.97
3	**Bihar**	33.31	201.03	396.16	590.00
4	**Gujarat**	23.29	222.04	734.97	909.66
5	**Haryana**	56.19	13.41	631.12	1011.27
6	**Karnataka**	44.83	177.13	660.12	1025.74
7	**Kerala**	84.46	271.32	827.7	1177.68
8	**Madhya Pradesh**	32.97	195.63	235.47	560.16
9	**Maharashtra**	3.58	215.38	972.38	1193.90
10	**Orissa**	29.42	87.99	478.33	634.68
11	**Punjab**	83.19	13.7	763.27	899.28
12	**Rajasthan**	42.07	186.18	581.57	796.54
13	**Tamil Nadu**	46.43	229.61	706.61	956.17
14	**Uttar Pradesh**	30.07	159.84	371.39	598.39
15	**West Bengal**	32.27	200.38	571.44	730.29
Source: Finance Accounts					

Table 3.9 shows the per capita expenditure on education in 15 States for the periods 1980-81, 1990-91, 2000-01 and 2006-07. In 2006-07 the per capita expenditure is highest in Maharashtra (Rs.1193.90) followed by Kerala (Rs.1177.68). There are wide differences with in the States. In general per capita expenditure is low in poorer States except Rajasthan (Rs.796.54). There is increased trend for all States from 1980-81 to 2006-07. It can be seen that per capita expenditure is higher in more developed States than the poorer States.

3.3.3 Analysis of Public Expenditure on Health

Increasingly the governments are facing pressures to increase the budgetary allocations to social sector. Recently there has been suggestion to increase the budget allocations to health sector and increase it to 3 percent of GDP. Is this feasible goal? We certainly need some understanding of the behaviour of public expenditures on health. Health is state subject in India and therefore analysis of public health expenditures by States assumes greater significance. The analysis of health care expenditures in general has been a topic of research and discussion in recent times globally. Since in India we are talking about increasing the public expenditures on health to 3 percent of GDP, this analysis would provide some insights into our proposed goal. So we have taken the following sub-sections for our analysis.

3.3.3.1 Growth Rates

Table 3.10 provides data on the annual rate of growth of the total health expenditure and also revenue and capital expenditure on medical and public health of the 15 States for the period 1980-2006. Only two States (Andhra Pradesh and Uttar Pradesh) showed more than 14% of growth rate where as Karnataka, Punjab and Rajasthan showed more than 13%. The remaining States had a growth rate below 13 percent except Bihar which is at 10.03%. The contribution of revenue expenditure in the growth rate was the highest than the capital expenditure except in the State Andhra Pradesh, Gujarat and Haryana. Further, there is evidence that the growth rate showed decrease over the whole period.

Table 3.10 Government Expenditure on Health -Annual Compound Growth Rate (%)										
S.No.	**States/Year**	**80s**			**90s**			**80s and 90s together**		
		Rev exp	**Cap exp**	**Total exp**	**Rev exp**	**Cap exp**	**Total exp**	**Rev exp**	**Cap exp**	**Total exp**
1	**Andhra Pradesh**	16.50	03.02	16.15	11.32	24.60	13.99	14.30	13.20	14.24
2	**Assam**	18.89	15.32	18.24	9.28	-03.46	6.56	13.50	1.78	12.46
3	**Bihar**	17.02	0.05	16.04	5.16	7.41	5.22	10.41	3.44	10.03
4	**Gujarat**	14.47	4.57	14.38	11.42	32.24	11.63	12.49	15.36	12.53
5	**Haryana**	13.99	7.3	13.36	11.54	1.71	11.03	13.33	5.67	12.82
6	**Karnataka**	15.1	6.01	14.55	10.42	25.22	11	13.2	19.05	13.7
7	**Kerala**	13.6	7.04	13.35	11.17	19.15	11.5	12.53	14.67	12.64
8	**Madhya Pradesh**	15.03	14.1	15.02	8.40	7.01	8.32	12.03	11.55	12.03
9	**Maharashtra**	14.00	14.01	14.00	6.10	8.10	6.10	12.5	14.00	12.6
10	**Orissa**	11.6	11.41	11.6	10.02	8.50	10.1	11.53	15.50	12.1
11	**Punjab**	15.54	1.03	15.05	11.21	-32.41	10.43	14.02	-13.24	13.19
12	**Rajasthan**	15.18	11.10	15.10	10.51	-1.26	10.04	13.12	10.30	13.05
13	**Tamil Nadu**	15.10	4.42	14.33	9.10	12.51	9.01	12.03	10.40	12.04
14	**Uttar Pradesh**	17.40	18.44	17.50	9.02	-8.33	8.10	14.24	3.05	14.02
15	**West Bengal**	14.10	8.23	14.01	16.00	5.05	11.1	12.10	9.10	12.04
Source: Finance Accounts										

3.3.3.2 Ratio to GSDP

The percentage spending as ratio of GSDP of the States showed declining trend (see Table 3.11). When we observe total expenditure on health as a percentage of GSDP we notice that Bihar and Uttar Pradesh does not fare very badly here. In fact Bihar comes across as one of the State with highest ratio. High income States like Maharashtra, Gujarat comes had not done well. States like Bihar, Assam, Andhra

Pradesh and Punjab showed very high fluctuation in total expenditure on health to GSDP ratio while some States like Maharashtra and Gujarat does not show much fluctuation. One thing which comes out from the Table 3.11 is that in almost all the States total expenditure as a percentage of GSDP has not increased much during the period. During the period 1993 to 2005 health expenditure as a percentage of GSDP showed a declining trend.

Table 3. 11 Total Government Expenditure on Health as ratio of GSDP (%)

S.No.	States/Year	1993-94	1996-97	2000-01	2005-06
1	**Andhra Pradesh**	0.01	0.01	0.01	0.01
2	**Assam**	0.01	0.01	0.01	0.01
3	**Bihar**	0.01	0.01	0.01	0.01
4	**Gujarat**	0.01	0.01	0.01	0.00
5	**Haryana**	0.00	0.00	0.00	0.00
6	**Karnataka**	0.01	0.01	0.01	0.01
7	**Kerala**	0.01	0.01	0.01	0.01
8	**Madhya Pradesh**	0.01	0.01	0.01	0.01
9	**Maharastra**	0.01	0.01	0.01	0.00
10	**Orissa**	0.01	0.01	0.01	0.00
11	**Punjab**	0.01	0.01	0.01	0.01
12	**Rajasthan**	0.01	0.01	0.01	0.01
13	**Tamil Nadu**	0.01	0.01	0.01	0.01
14	**Uttar Pradesh**	0.01	0.01	0.01	0.01
15	**West Bengal**	0.01	0.01	0.01	0.01

Source: Finance Accounts

3.3.3.3 Ratio to Total Expenditure

In contrast with the levels of expenditure on education the level of public expenditure on health as ratio of total expenditure is low in the States (Table 3.12). It is also noteworthy that the expenditure on health has steadily declined as a share of total expenditure from 1980 to 2006. It is important to note that there has been significant change in the State of Rajasthan which is the only State that has an increasing trend during this period.

Table 3.12 Government Expenditure on Health as ratio of Total Expenditure (%)

S.No.	States/Year	1980-81	1990-91	2001-02	2006-07
1	**Andhra Pradesh**	0.04	0.05	0.04	0.03
2	**Assam**	0.05	0.06	0.04	0.04
3	**Bihar**	0.04	0.04	0.03	0.04
4	**Gujarat**	0.05	0.05	0.03	0.03
5	**Haryana**	0.04	0.04	0.03	0.02
6	**Karnataka**	0.05	0.05	0.05	0.03
7	**Kerala**	0.07	0.06	0.05	0.05
8	**Madhya Pradesh**	0.05	0.05	0.04	0.04
9	**Maharastra**	0.05	0.05	0.04	0.03
10	**Orissa**	0.05	0.05	0.04	0.03
11	**Punjab**	0.06	0.06	0.04	0.03
12	**Rajasthan**	0.06	0.06	0.05	0.04
13	**Tamil Nadu**	0.07	0.06	0.04	0.03
14	**Uttar Pradesh**	0.03	0.05	0.03	0.06
15	**West Bengal**	0.09	0.06	0.05	0.04

Source: Finance Accounts

3.3.3.4 Ratio to Social Service Sector

Over the period of analysis there was no clear trend in the public expenditure on health as ratio of social service expenditure and it fluctuated between 10 to 19 percent. Table 3.13 presents a comparison of the public expenditure on health as a ratio of social sector. All States decreased this ratio in 2006-07 except Bihar and Uttar Pradesh.

Table 3.13 Government Expenditure on Health as ratio of Social Service Sector Expenditure (%)

S.No.	States/Year	1980-81	1990-91	2001-02	2006-07
1	Andhra Pradesh	0.12	0.14	0.13	0.10
2	Assam	0.12	0.15	0.10	0.11
3	Bihar	0.11	0.11	0.07	0.12
4	Gujarat	0.14	0.14	0.07	0.08
5	Haryana	0.14	0.12	0.10	0.08
6	Karnataka	0.16	0.15	0.13	0.10
7	Kerala	0.14	0.15	0.15	0.15
8	Madhya Pradesh	0.16	0.13	0.10	0.12
9	Maharashtra	0.17	0.15	0.11	0.08
10	Orissa	0.14	0.15	0.12	0.09
11	Punjab	0.15	0.18	0.18	0.14
12	Rajasthan	0.17	0.15	0.11	0.10
13	Tamil Nadu	0.19	0.14	0.12	0.10
14	Uttar Pradesh	0.10	0.14	0.11	0.18
15	West Bengal	0.19	0.14	0.14	0.13

Source: Finance Accounts

3.3.3.5 Per Capita Expenditure on Health

Table 3.14 Per Capita Expenditure on Health (Rs.)					
S.No.	**States/Year**	**1981-82**	**1991-92**	**2001-02**	**2006-07**
1	**Andhra Pradesh**	12.85	45.08	144.05	186.63
2	**Assam**	11.38	55.73	110.27	170.30
3	**Bihar**	12.3	36.44	44.14	111.85
4	**Gujarat**	21.09	58.73	124.87	184.78
5	**Haryana**	21.85	50.89	127.43	187.34
6	**Karnataka**	18.23	53.87	162.66	210.02
7	**Kerala**	24.38	65.86	204.28	300.85
8	**Madhya Pradesh**	18.4	52.49	98.09	154.54
9	**Maharashtra**	22.06	59.43	166.97	197.07
10	**Orissa**	15.78	42.82	104.62	131.16
11	**Punjab**	21.13	85.28	235.47	243.16
12	**Rajasthan**	16.04	54.31	136.1	183.76
13	**Tamil Nadu**	21.28	63.58	160.51	216.25
14	**Uttar Pradesh**	11.91	38.83	66.1	209.39
15	**West Bengal**	23.51	50.39	153.83	172.07
Source: Finance Accounts					

Table 3.14 shows the absolute levels and change in per capita spending from 1981-8 to 2006-07 for the 15 States considered here. The first important point that emerges from this is that there is very wide variation across States, and further, these gaps have actually widened over time. In 1981-82, per capita spending by the State government of Assam on all health was only Rs.11.38, which was the lowest - just above half the level in the highest-spending State Punjab. By 2006-07, the differences had grown even sharper. As we see that per capita expenditure in Bihar was Rs

111.85 which was the lowest in 2006-07, was less than a quarter of per capita expenditure of Kerala, and followed by Madhya Pradesh and Orissa where the per capita expenditure was less than half of the level in Kerala. From the Table 3.14 we can clearly observed that per capita spending in rich states is higher than the poor except Uttar Pradesh with Rs. 209.39 in 2006-07.

3.4 Human Development Indicators

The trends analysis of education and health outcome indicators for the 15 States are presented in the following sections (3.4.1 and 3.4.2).

3.4.1 Education Indicators

Literacy rate is a very important indicator which represents a person's status in the society. Literacy is influenced by various socio-cultural and economic factors operating in the regions. Consequently there is a large variation in literacy across regions. Enrolment and dropout rates are also crucial indicators in the study of literacy levels. The trends analysis of these three education outcome indicators brings out the actual levels of learning at the primary stage.

3.4.1.1 Literacy Rate

According to Census (1981, 1991 and 2001) data literacy rates have been rising in India, and the percentage rise is more among rich States than among poor States (Table 3.15). Literacy rate is much lower in poorer States than the rich States. The percentage of literate in 2001 reveals highest literacy (70-90%) in Kerala, Maharastra,

Tamil Nadu, Gujarat, and Punjab. Apart from these States Andhra Pradesh, Assam, Haryana, Karnataka, Madhya Pradesh, Orissa, Rajasthan and West Bengal also have a high (60-70%) literate population. The percentage of literate population is less than 60% is seen in Bihar and Uttar Pradesh.

Table 3.15 Literacy Rate (%)

S.No	States/ Year	1981	1991	2001
1	**Andhra Pradesh**	35.66	44.09	61.1
2	**Assam**	NA	52.89	64.3
3	**Bihar**	32.03	38.48	47.5
4	**Gujarat**	52.21	61.29	70.0
5	**Haryana**	43.85	55.85	68.6
6	**Karnataka**	46.2	56.04	67.0
7	**Kerala**	81.56	89.81	90.9
8	**Madhya Pradesh**	34.22	44.2	64.1
9	**Maharashtra**	55.83	64.87	77.3
10	**Orissa**	40.96	49.09	63.6
11	**Punjab**	48.12	58.51	70.0
12	**Rajasthan**	30.09	38.55	61.0
13	**Tamil Nadu**	54.38	62.66	73.5
14	**Uttar Pradesh**	33.33	41.6	57.4
15	**West Bengal**	48.64	57.7	69.2
	INDIA	**43.56**	**52.21**	**65.2**

Source: Census Reports 1981, 1991, 2001, GOI.

3.4.1.2 Gross Enrolment Ratio

Table 3.16 Gross Enrolment Ratio (%)

S.No.	States/Year	1986-87	1990-91	2000-01	2006-07
1	**Andhra Pradesh**	101.65	109	104.1	96.47
2	**Assam**	90.22	105	117	98.42
3	**Bihar**	80.41	82.9	79.9	94.67
4	**Gujarat**	112.29	82.9	126	120.12
5	**Haryana**	85.5	86.8	78.9	88.21
6	**Karnataka**	95.3	108.99	113.58	106.99
7	**Kerala**	107.2	102.8	87.14	93.42
8	**Madhya Pradesh**	97.12	106.13	111.42	150.41
9	**Maharashtra**	117.79	125.54	110.41	113.61
10	**Orissa**	95.04	113.9	112.6	114.07
11	**Punjab**	94.36	96.39	79.05	81.33
12	**Rajasthan**	79.14	79.19	111.99	120.17
13	**Tamil Nadu**	115.84	133.95	96.44	117.81
14	**Uttar Pradesh**	76.22	71.06	65.69	113.75
15	**West Bengal**	115.84	113.87	107.15	102.77
	INDIA	**95.96**	**100.1**	**95.66**	**111.24**

Source: Selected Educational Statistics, Department of Education, MHDR Govt. of India, New Delhi: Various Issues and Economic Survey 2008-09

There was an increase in the gross enrolment ratio of primary schools in all States except, Andhra Pradesh, Kerala, Maharastra, Punjab and West Bengal over the period 1986-87 to 2006-07 (Table 3.16). Among the States, in 2006-07 the enrolment ratio was highest in Madhya Pradesh (150.41%), the lowest enrolment ratios in Punjab (81.33%). During this period the gross enrolment ratio is above 100 in all States except Andhra Pradesh, Assam, Bihar, Haryana, Kerala and Punjab. There is increase in enrolment ratios in poorer States than the rich States.

3.4.1.3 Drop-out Rates

Table 3.17 Drop-out rates (I-V) (%)

S.No.	States/Year	1981-82	1992-93	2001-02	2004-05
1	**Andhra Pradesh**	60.3	54.96	43.03	31.95
2	**Assam**	62.5	55.37	48.64	50.07
3	**Bihar**	69.6	62.52	61.64	64.04
4	**Gujarat**	54.6	41.37	25.05	35.09
5	**Haryana**	21.8	17.95	30.51	4.81
6	**Karnataka**	60.8	41	23.87	15.88
7	**Kerala**	10.1	2.35	0	0
8	**Madhya Pradesh**	52.6	34.34	29.55	26.36
9	**Maharashtra**	54.9	30.33	7.37	6.7
10	**Orissa**	63.4	50.63	39.38	39.34
11	**Punjab**	60.1	31.42	20.34	23.96
12	**Rajasthan**	48.8	74.68	63.2	56.59
13	**Tamil Nadu**	34.2	18.27	27.24	0.94
14	**Uttar Pradesh**	44.5	33.77	49.4	16.94
15	**West Bengal**	60.1	57.75	39.86	43.65
	INDIA	53.5	45.01	39.03	28.49

Source: Selected Educational Statistics 1997-98, MHRD; VI All India Educational Survey, NCERT, MHRD, Govt. of India. 2004-05

Table 3.17 shows the primary school drop-out rates for the Major States of India from 1981-82 to 2004-05. At all India level there was a reduction in drop-out rates from 53.5% in 1981-82 to 28.49% in 2004-05. In 2004-05 eight States showed drop-out rates less than the all India average (28.49%) when compared to 1981-82 where it was six states only to an average of (53.5%). Among major States in 1981-82, Bihar has a very high (69.6%) drop-out rate followed by Orissa (63.4%), Assam (62.5%), Karnataka (60.3%), Punjab and West Bengal (60.1%) and Kerala has a very low

(10.1%) drop-out rate. During 2004-05 the drop-out rates reduced to 50% when compared with all India level in 1981-82. On the other hand during the year 2004-06, a few States namely Maharastra, Haryana, Tamil Nadu, and Kerala have below 10% drop-out rates. A number of other States have an average drop-out rate between 10-20% Uttar Pradesh and Karnataka fall in this category. In the rest of the States drop-out rates in primary school are above 20%.

3.4.2 Health Outcome Indicators

If the quality of human capital is not good physical capital and natural resources cannot be properly utilized and growth neither be sustained nor be qualitative. Health is a major segment of Human capital. The health status is usually measured in terms of life expectancy at birth, infant mortality rate, child mortality rate, fertility rate, crude birth rate and crude death rate. The following sections 3.4.2.1 to 3.4.2.5 are examined to analysis the trends in the selected health out come indicators of the 15 States.

3.4.2.1 Life Expectancy at Birth for Males

The comparison of the data from Table 3.18 for the period 1981-85 and 2002-06 on life expectation at birth for males shows that all States have improved on the value of the life expectancy. In 1981-85, almost all States are having the life expectancy at birth below 60 years except West Bengal, Haryana, Punjab and Kerala. Among all the States, Kerala is found to have the higher life expectancy at birth of 71.4 years for males in 2002-06. In contrast, Madhya Pradesh is found to have a lowest life

expectancy of 58.1 years. States like Assam and Orissa seems to be lower than 60 years of life expectancy at birth. The difference between the higher value and lower value of life expectancy at birth is 13.3 years in 2002-06.

Table 3.18 Life Expectancy at Birth for Males (years)

S.No.	States/Year	1981-85	1991-95	2002-06
1	**Andhra Pradesh**	57.2	60.3	62.9
2	**Assam**	52	55.6	58.6
3	**Bihar**	54.2	60.1	62.2
4	**Gujarat**	55.5	60.2	62.9
5	**Haryana**	61.5	63	65.9
6	**Karnataka**	59.7	60.6	63.6
7	**Kerala**	65.4	69.9	71.4
8	**Madhya Pradesh**	51.5	54.7	58.1
9	**Maharashtra**	59.6	63.5	66
10	**Orissa**	53.1	56.6	59.5
11	**Punjab**	62.6	66.1	68.4
12	**Rajasthan**	53.3	58.3	61.5
13	**Tamil Nadu**	56.5	62.3	65
14	**Uttar Pradesh**	51.4	57.3	60.3
15	**West Bengal**	60	60.2	64.1
	INDIA	**56.9**	**60.1**	**62.6**

Source: Economic Survey. GOI. Various Issues

3.4.2.2 Life Expectancy at Birth for Females

Table 3.19 Life Expectancy at Birth for Females (years)				
S.No.	**States/Year**	**1981-85**	**1991-95**	**2002-06**
1	**Andhra Pradesh**	54.2	62.8	65.5
2	**Assam**	51.9	54.2	59.3
3	**Bihar**	51.2	58.1	60.4
4	**Gujarat**	59.3	62	65.2
5	**Haryana**	59	64	66.3
6	**Karnataka**	62	63.9	67.1
7	**Kerala**	71.5	75.6	76.3
8	**Madhya Pradesh**	51.9	53.2	57.9
9	**Maharashtra**	62.1	65.8	68.4
10	**Orissa**	53	56.2	59.6
11	**Punjab**	63.6	68.9	70.4
12	**Rajasthan**	53.8	59.4	62.3
13	**Tamil Nadu**	57.4	64.4	67.4
14	**Uttar Pradesh**	48.5	56	59.5
15	**West Bengal**	58.1	60.3	65.8
	INDIA	**57.1**	**61.4**	**64.2**
Source: Various Issues, Economic Survey. GOI.				

The comparison of life expectancy at birth of females of major States for the period 1981-85 to 2002-06 is shown in Table 3.19. The States less than 60 years are seen in Assam, Bihar, Madhya Pradesh, Orissa, and Uttar Pradesh. Among all the States, Kerala is found to have the highest life expectancy at birth 76.3 years (2002-06). In contrast, Madhya Pradesh is found to have a life expectancy of 57.9 years. The high income States showed better than poorer States in case of life expectancy at birth.

3.4.2.3 Infant Mortality Rate

Table 3.20 Infant Mortality Rate (per 1000 live births)

S.No.	States/Year	1981	1991	2001	2007
1	**Andhra Pradesh**	86	73	66	54
2	**Assam**	106	81	74	66
3	**Bihar**	118	69	62	58
4	**Gujarat**	116	69	60	52
5	**Haryana**	101	68	66	55
6	**Karnataka**	69	77	58	47
7	**Kerala**	37	16	11	13
8	**Madhya Pradesh**	142	117	86	72
9	**Maharashtra**	79	60	45	34
10	**Orissa**	135	124	91	71
11	**Punjab**	81	53	52	43
12	**Rajasthan**	108	79	80	65
13	**Tamil Nadu**	91	57	49	35
14	**Uttar Pradesh**	150	97	83	69
15	**West Bengal**	91	71	51	37
	INDIA	**77**	**74**	**71**	**55**

Source: ***SRS, Registrar General of India. Economic Survey2008-09***

Over time infant mortality has been falling in India, though it is high at 55 per 1000 live births. Table 3.20 provides infant mortality rates for 15 States of India and over time. In 2007, Kerala had the lowest infant mortality rate 13 per 1000 live births; Madhya Pradesh other end as many as 72 infant deaths per 1000 live births. The densely populated States of Uttar Pradesh, Bihar, Rajasthan and Orissa all had infant mortality rate above 55. Though, infant mortality rates have fallen all States between 1981 and 2007, the rate of decline has been higher in the ten years between 1991 and

2007 compared to the decade between 1981 and 1991. The decline has been uneven across some Indian States. More disturbingly in some States, namely Tamil Nadu, Andhra Pradesh and Haryana, infant have actually increased between 1981 and 2001.

3.4.2.4 Child Mortality Rate

Table 3.21 Child Mortality Rate (0-4) (per 1000 live births)

S.No.	States/Year	1990	1995	2000
1	**Andhra Pradesh**	20.7	19.1	15.9
2	**Assam**	28.5	24.7	22.9
3	**Bihar**	26.2	28.3	19.2
4	**Gujarat**	26	19.9	19
5	**Haryana**	21.8	22.7	18.5
6	**Karnataka**	21.1	18.2	15.2
7	**Kerala**	4.6	4.3	3.3
8	**Madhya Pradesh**	39.4	33	26.9
9	**Maharashtra**	16.5	14.9	11
10	**Orissa**	35.9	32.2	25.1
11	**Punjab**	18.3	14.9	15
12	**Rajasthan**	29.5	29.3	24.6
13	**Tamil Nadu**	17	14.5	12
14	**Uttar Pradesh**	36.6	30.8	26.8
15	**West Bengal**	19.7	18.6	13.2
	INDIA	**26.3**	**24.2**	**19.5**

Source: ***SRS, Registrar General of India.***

The Table 3.21 shows the child mortality rate has reduced from 26.3 per 1000 live births in 1990 to 19.5 per 1000 live births in 2000. In 1990 the States varied between 4.6 per 1000 live births (Kerala) and 39.4 (Madhya Pradesh) per 1000 live births.

India and the States showed decline from 1990 to 2000. But this decrease conceals considerable variations. In 2000 the child mortality rate is highest in Madhya Pradesh (27 per 1000) followed by Uttar Pradesh (26.8 per 1000). The States with more than 20 per 1000 live births and less than 25 per 1000 live births are seen in Assam, Orissa, Rajasthan and the remaining States ranges between 10-20 accept Kerala with lowest child mortality rate of 3.3 per 1000 lives.

3.4.2.5 Crude Death Rate

Table 3.22 Crude Death Rate (%)

S.No.	States/ Year	1981	1991	2001	2007
1	**Andhra Pradesh**	11.1	9.7	8.2	7.4
2	**Assam**	12.6	11.5	9.6	8.6
3	**Bihar**	13.9	9.8	8.2	7.5
4	**Gujarat**	12	8.5	7.8	7.2
5	**Haryana**	11.3	8.2	7.6	6.6
6	**Karnataka**	9.1	9	7.6	7.3
7	**Kerala**	6.6	6	6.6	6.8
8	**Madhya Pradesh**	16.6	13.8	10.1	8.7
9	**Maharashtra**	9.6	8.2	7.2	6.6
10	**Orissa**	13.1	12.8	10.4	9.2
11	**Punjab**	9.4	7.8	7.4	7
12	**Rajasthan**	14.3	10.1	8	6.8
13	**Tamil Nadu**	11.8	8.8	7.7	7.2
14	**Uttar Pradesh**	16.3	11.3	10.1	8.5
15	**West Bengal**	11	8.3	7	6.3
	INDIA	**12.5**	**9.8**	**8.4**	**7.4**

Source: SRS, Registrar General of India, Economic Survey 2008-09.

A look at the data on death rate it is clear that there is decline in the total death rate. The data on the years 1981, 1991, 2001 and 2007 are shown in the Table 3.22 indicate that crude death rate for India has come down from 12.5% to 7.4% in 2007. The crude death rate in 1981 for Kerala was lowest and Madhya Pradesh was highest where as in 2007 crude death rate was highest for Orissa (9.2%) and remains lowest for West Bengal (6.3%). The crude death rate for Rajasthan has fallen down from 14.3% in 1981 to 6.8% in 2007 which is very interesting and needs a closer look. When we observe the State Kerala though shown lower crude death rate has gone up in 2007 as compared to 1981.

3.5 Summing Up

• Per capita spending on human development in the States is substantially higher than the Centre in India. It is, however low in relation to a number of densely populated States.

• Although the per capita expenditure on human development has also been increasing in absolute terms, it has not kept pace with the growth of GSDP in the States. As a result, despite a rise in per capita expenditure on human development, the human development expenditure ratio has fallen over the 1990s.

• The slow growth of expenditure on human development relative to GSDP is closely related to the fiscal deterioration in the States in particular because of rise in debt stock and rising expenditure on salaries, wages and pensions from 1998-99 onwards.

• The major constraint on public spending on human development is the dependence of the State on Centre for its revenues. Fluctuations in Central transfers are an

important determinant of the fiscal situation in the State which in turn affects the capability of the State to invest in human development.

• Within the social sector, education accounts for a large share of expenditure. Despite deterioration in fiscal conditions, the States has managed to keep spending on education at more than 7% of GSDP. In contrast, spending on other human development areas, including health, as a share of GSDP has tended to decline.

• Though the gross enrolment ratio has been increased in the States, it is estimated that 59 million children in age group of 6-14 are out of school.

• Infant and child morbidity and death rates are intolerably high in India. Not only social justice but economic efficiency is being compromised as India does little to protect the health and well-being of its future generations.

CHAPTER 4

THEORETICAL FRAME, DATA AND MEASUREMENT OF VARIABLES

4.1 Introduction

In Chapter 2, we reviewed the literature relating to the study. In Chapter 3 the trend analysis of public expenditure on social services and their outcome development indicators were presented. In this chapter we will concentrate on constructing a theoretical model, which incorporates the public expenditure effects on social services to analyze a State- specific social service.

Since the study focuses on the relationship between State's public expenditure and social services, a model with social service information will be developed for the use in the State specific cases.

Section 4.2 discusses methods used by the past studies, their shortcomings and limitations in past studies and how we propose to improve. Section 4.3 proposes a broad approach followed by a model for State specific studies, adequacy or inadequacy of OLS, need for Panel models and which Panel models to be used and the proposed tests. Section 4.4 discusses Data and measurement, Data sources, data limitations, Measurement of dependent and independent variables and lastly conclusion.

4.2.1 Theoretical Arguments for the State Specific Model

Lekha S. Chakraborty (2003) examined the impact of public expenditure on human development across selected developed and developing countries. Using fixed effects model of pooled least squares for the early 1990s; the impact analysis between per capita public expenditure on health and education and Human Development Index (HDI) revealed that there is a positive functional relationship between the variables.

H. Issa and B. Ouattara (2005) studied to assess the impact of health expenditure on IMRs and also examined the effect of three variables (per capita income, female education and the cleanliness of the environment) on IMRs. The study tests the changing roles of public and private expenditures on health along the development process and argues that during the early development stages public expenditure is more effective than private expenditure, while as a country develops private expenditure becomes increasingly more effective and public expenditure gradually losses its importance. Using data for 160 countries for the period 1980-2000 and employing OLS and panel data techniques they found strong support for the above argument.

Shaikh.I. Hussain (1996), the study used regressions to assess the impacts of changing government policies and income levels on infant mortality rates and life expectancy at birth. The data used are a time-series of 1983- 93 from cross-section of 29 provinces in China. To isolate the relative effects of each determinant of health improvement, three different econometric procedures are used, such as OLS, Fixed

and Random Effects. The study concluded that there is negative on IMRs and positive impact on life expectancy at birth due the changing government policies and income levels.

Raghbendra Jha, et.al. studeid to test whether public expenditures on education, health and other development activities have been effective in reducing poverty in India. To ensure sensitivity and robustness of the results, three different measures of poverty belonging to the Foster-Greer-Thorbecke group of poverty measures are used. They considered various types of education expenditures, viz., government expenditures on elementary, secondary, higher/university and "other" levels for fourteen Indian States are used for estimating poverty. Using unbalanced panel data techniques, they tested Fixed effects, Random effects and OLS models, and concluded that education, health and development expenditures help to reduce poverty.

Sanjeev Gupta, et.al (2004), using panel data for 120 developing countries from 1975 to 2000, they explored the direct and indirect channels linking social spending, human capital, and growth in a system of equations. They found that both education and health spending have a positive and significant direct impact on the accumulation of education and health capital, and thus can lead to higher economic growth. They also found that the policy interventions, such as improving governance, reducing excessive budget deficits, and taming inflation, can also be helpful in moving

countries towards the Millennium Development Goals (MDGs). They concluded that higher spending alone is not sufficient to achieve the MDGs

Sergio Beraldo, et.al they studied how public and private expenditures in health and education affect economic growth by their influence on people's health, abilities, skills and knowledge. Their empirical analysis was based on a panel of 19 OECD countries observed between 1971 and 1998 showed a robust positive correlation between expenditure in health and education and GDP growth. The estimations showed that there is stronger positive impact on health than for education.

World Bank (2005), World Bank report includes an analysis of infant mortality rate and health expenditure using a panel data for the Indian States during 1980-99. The study finds no effect of health expenditure on mortality rate once fixed effects and a linear time trend are included in the model and concludes that there is no much effect on infant mortality.

4.2.2 Their shortcomings and limitations in general

Against the above arguments on the role of per capita income, public expenditure on social sectors particularly on education and health indicators along with the development process has important policy implications that matters both governments and world organizations to design for the appropriate education and health programs. Giving the importance of this argument, the fact that it has not been examined empirically creates a serious gap in the literature with an urgent need to fill it. It is

clear from the above studies that the possible link between public expenditure and social sectors outcomes has been identified using different methodologies and there is no single measure of openness in these studies to quantify the effect of government expenditure. The available studies so far documented a range of effects- from no impacts, to limited impacts and to impacts on only specific interventions. Though the theoretical link between expenditure and social sector performances through their outcome measurement have not well documented in the literature, some sought of nexus are developed using various measures. The causal relationship between education and health expenditures and their outcomes continues to attract the attention of many. However, despite decades of intensive study, there is no general consensus regarding the effectiveness of monetary education and health inputs for their outcomes. In particular, reviews of literature that summarize the debate on the effects of education and health expenditures often advocate conflicting views.

4.2.3 The Proposed Study to Improve

Our study differs from other studies in this field in several aspects. First, to the best of our understanding it is the only study that public expenditure on social sectors into its education and health components to study their effects on education and health indicators along the development process. Second, it is the study that employs panel data techniques to assess the relative importance of education and health spending on their outcomes, while the overwhelming majority of studies in this field use either time series or cross-sections. On the other hand, while the rising cost of the social sector system in India has been a hot topic of discussion, relatively little attention has

been placed on the relationship between spending on education and health and their outcomes in the country. This is surprising, since along with ever-increasing these expenditures comes the need to evaluate their effectiveness. So our study, focused on, Did past expenditure on education and health affect their outcomes of Indian in any way? Are increases in expenditure needed to improve the education and health outcomes of the India? These are the questions that can only be answered by studying the relationship between education and health outcomes and their expenditures in India.

4.3.1 The Broad Approach

Following the recent proliferation of cross-country studies of the impact of public expenditure on growth, attention has turned to how public expenditure can most effectively be allocated so as to improve human development indicators. One answer is premised on the view that public expenditure be targeted to the poor. Consequently public expenditure should be increased in the countries with poor human development there by achieving growth, in turn reduces poverty. Irrespective of whether growth is welfare enhancing and of whether public expenditure contributes to such growth, there are many ways in which public expenditure can contribute to welfare. Some expenditures such as, education and health expenditures are more likely to enhance welfare than other types of expenditures and thus likely to benefit the poor.

Key questions for policy and education and health sector strategy are how far public expenditure has been instrumental in bringing about the progress in education and health status experienced in the 15 major States of India over the last twenty five years, and whether expenditure programmes have been particularly effective.

To answer the first of these questions research has sought econometric estimates of strength and significance of the factors most likely to influence education and health status based on reduced form versions of a generally agreed understanding of the determination of education and health outcomes. Education and Health outcomes are a function of a wide variety of factors –economic, social, cultural, geographical and environmental, as well as health and education sectors interventions. The proximate determinants of the education and health status of members of a household are usually taken to be:

For education per capita income – a proxy indicator of household poverty, real per capita GDP – a possible indicator of households' expectations of their children's income earning potential., Adult literacy – an indicator of the existing educational status of the population, and of parents' appreciation of the value of education, -Expenditure on primary education as a percentage of GNI – an indicator of the volume of resources flowing into primary education, -Unit costs – expenditure per primary school pupil as a percentage of per capita income, -The primary school pupil/teacher ratio – an indicator of efficiency in the supply of educational services.

Where as for Education household income (purchasing power), asset holding and access to insurance, income and asset distribution, other personal characteristics of household members, including lifestyle, sexual practices, and knowledge of good nutrition, diet, hygiene and health maintenance practice, Location (urban or rural), Access to clean water and sanitation, Prevalence of communicable diseases and of environmental health hazards, Relevance, quality, availability, price and accessibility of public and private preventive and curative health services.

An important point to note is that the effects of government interventions on education and health are indirect more often than direct, and that they affect education and health outcomes through a multiplicity of channels and programmes. The most direct interventions include preventive action (e.g. immunization campaigns) and curative care services provided in the public sector. But governments are also responsible for education and health status and epidemiological monitoring, information, guidance and education on health matters, coordinating and regulating private providers of health care and insurance, and health-improving environmental expenditure and regulation.

Another important observation is that some of the expected determinants of good health are endogenous to the process of development, notably household income and wealth, lifestyle, diet and knowledge about nutrition and sanitation. Just as health contributes powerfully to individual productivity and to household income in poor country's incomes and education levels particularly the education of girls – are

important in improving health. Health and Education outcomes are thus codetermined with other facets of poverty reduction.

Econometric evidence

The regression equations used for education outcomes are linear of the form:

Education Outcomes = f (Per capita income, adult literacy, per capita GDP, pre schooling expenditure / GNP, Unit cots variables)

where education outcome represents literacy rate, net or gross enrolment ratios, dropout rates, completion rates, repetition rates.

Empirical estimates of the effects of public expenditure on health are usually based on 'reduced form' estimating equations in which public expenditure features as an argument alongside the other hypothesised influences. These typically take the following form:

Health Outcomes = f {Public Expenditure, per capita GDP, income distribution, water & sanitation, rural / urban, female education, vaccination rates, socio-cultural variables}

where Health Outcomes are generally life expectancy at birth, infant mortality rate, child mortality, crude birth rate, crude death rate, fertility rates at the national level or at the level of sections of the population, such as the poor, or the urban or rural populations.

From the above education outcome indicators we had selected literacy rate, gross enrolment ratios and dropout rates as education outcome indicators where as life expectancy at birth for males, life expectancy at birth for females, infant mortality rates, child mortality rate, and crude death rate for health outcomes. The explanatory variables are per capita income and public expenditure on education for education outcome indicators where as per capita income and public expenditure on health for health outcome indicators.

The reasons for selecting the above outcome and explanatory variables and also 15 major States are as follows.

1. We could not get data for other variables and for other States.
2. Availability of data sources is very difficult.
3. From the empirical side, we have done impact analysis with other variables such as per capita GDP, per capita expenditure, capital expenditure, infant mortality rate, fertility rate, as they showed insignificant results.
4. Based on theoretical and empirical evidences many of the studies concentrated on government spending and per capita income particularly in the countries with poor welfare.
5. We have done with regressions with OLS and Random models but found insignificant results.

To capture this, the approach adopted here is to assess the impact of State-level public expenditure of India on human development indicators particularly in education and

health. We took public expenditure on education and health in a sample of 15 States (see Section 3.3) of India over a period 1980-2006. Using Least Square Dummy Variable model (Fixed Effects model) regressions, we evidence that public expenditure is associated with higher development and it tends to have a greater effect on outcome indicators in those countries like India with lower welfare.

4.3.2 The Regression Specifications

This section develops a model, which can be applied for the study of public expenditure on social services of the States and its impact on human development. We start with very simple and then extend the simple model into a model that can be applied to the State-specific model.

$$Y = bX \qquad (4.1)$$

Y = indicates the dependent variable

X= indicates independent variable.

By taking logarithm of both sides of the equation (4.1), the mathematical equation can be converted into a statistical model by adding an error term. The model can be estimated by OLS technique in log-log linear model.

$$\ln Y = \beta_0 + \beta_1 \ln X + \mu \qquad (4.2)$$

Taking above OLS technique Equation (4.2), we generate the empirical equation, which can be estimated.

$$\ln Y_i = \beta_0 + \beta_1 \ln EXP_{1i} + \beta_2 \ln PCI_{2i} + \mu_i \qquad (4.3)$$

Y = dependent variable

EXP = total expenditure on education or health and

PCI = for per capita income

i = particular State

β_0 = intercept

μ_i = error term.

4.3.3 Adequacy or inadequacy of OLS

The OLS model yields, (1) The biased and inconsistent estimates in the regression parameters. This is an omission variables bias due to the fact that OLS deletes the individuals' dummies when in fact they are relevant. (2) Time-series and cross-section studies does not control the heterogeneity run the risk of obtaining biased results. (3) Time-series studies are plagued with multi-colinearity. (4) In pure cross-section and pure time-series data not able to identify and measure effects that are simple, they are ineffective in discriminating between the cases or individuals or States.

4.3.4 Empirical Models Using Panel Data

Panel data in the context of the model means the pooling of observations of cross-section units over a period of time. However, the model developed in Section 4.3.2 is best suited to explain dependent variables between States at a particular point of time

and it is suitable for a cross-sectional data set. We need to incorporate the time dimension t into the Equation (4.3) to convert the cross-section equations into panel equation for education and health outcome indicators of the States.

$$\ln Y_{it} = \beta_0 + \beta_1 \ln EXP_{1it} + \beta_2 \ln PCI_{2it} + \mu_{it} \qquad (4.4)$$

Y = dependent variable

EXP = total expenditure on education or health and

PCI = for per capita income

i = particular State

β_0 = intercept

μ_i = error term

t = time variant.

There are certain advantages of using panel data over cross-section data alone or time series data alone. These advantages are well documented in Baltagi (2005), Gujarati (2003) and Hsiao (1986). Some of the advantages relevant to our study area:

(1) Panel data give more observations and more informative data. By pooling cross-sections and time series, the number of observations is significantly greater than cross-section data alone or time-series data only. The degree of freedom will hence be higher. As a result, panel data enhance the efficiency of the estimation.

(2) Panel data utilise more variables, for which cross-section alone or time series only models unable to utilise. Some variables change over time but do not vary at each

point in time across cross-section. Those variables are cross-section invariant and cannot be used in cross-section regressions. However, by pooling cross-section and time series, such variables can add variation and can raise the explanatory power of the regression. Some variables do not change over time but vary across cross-section. Those variables are time invariant and do not contribute to time series regression but can be utilized in panel regression.

(3) Panel data increase the variability of the variables in the data set due to cross-section variation within each variable.

(4) Panel data are better in a study of dynamics of adjustment.

(5) Panel data reduce the collinearity among explanatory variables. This is also due to the cross-section variation within each variable.

However, some drawbacks are associated with the use of panel data:

(1) The use of panel data increases the complexity in data collection. Missing data, unbalanced panels and dropping some cross-sections due to poor availability of data are often the rules rather than exceptions that researchers encounter.

(2) The selectivity bias is that the sample is not drawn randomly from the population.

4.3.5 The Fixed Effect Panel Model

How to estimate a panel equation depends on the assumptions we make about the intercept, the slope coefficients and the error term of the model. That is, the subscripts of the parameters (β_s) indicate the ways to estimate the panel equation. For our study to utilise the benefits provided by the increasing variation from the panel data while

more realistically recognising the difference between cross-sections, we could use the following model:

$$\ln Y_{it} = \beta_{0i} + \beta_1 \ln EXP_{1it} + \beta_2 \ln PC_{2it} + \mu_{it} \qquad (4.5)$$

Equation (4.4) differs from Equation (4.5) by the subscript *i* for β_0. That is, only the intercept parameter varies across individual cross-sections, but not over time. All other parameters in the model are common across the cross-sections and over time. The variation of intercepts across the cross-sections captures the behavioural difference between individual States and over time. This model is known as the fixed-effect model (FEM) or the Least Squares Dummy Variables (LSDV) model.

4.3.6 The Proposed Tests

We can test whether the dummy intercept variables capture the individual differences, or put differently, whether the panel data model does have the cross-section variation by performing the F-test. In this F-test we treated the pooled OLS as the restricted model and FEM as the unrestricted model.

$$F = \frac{(RSS_1 - RSS_2)/(df_1 - df_2)}{RSS_2/df_2}$$

RSS_1 = Sum Squared Residuals for restricted (R) model

RSS_2 = Sum Squared Residuals for unrestricted (UR) model.

df_1 = Degree of freedom of restricted model

df_2 = Degree of freedom of unrestricted.

The results of the proposed F-test are presented in the Table 5.1

In addition to F-test, it is also important to check for the absence of serial correlation in the error term as consistency of the estimates depends on it. So First-order, AR (1) serial correlation tests is used for this purpose and results are presented in Table 5.2

4.3.7 The Empirical Model

Based on the arguments from Section 4.3.5 and Section 4.3.6, the model equation is as follows.

$$\mathbf{lnY_{it} = \beta_{0i} + \beta_1 lnEXP_{1it} + \beta_2 lnPCI_{2it} + \mu_{it}} \qquad \mathbf{(4.5)}$$

In summary, the Fixed Effect Model (FEM) would be the appropriate model to carryout the econometric analysis in this study. In the next section, we will make necessary adjustments to the variables in Equation (4.5) to tailor the data set that will be used in the estimation. We discuss the data collection procedure and data preparation for econometric analysis in the following sections.

4.4.1 Data and measurement

The data used for the analysis is secondary data. The time period taken for 15 Indian States over a twenty-five year period *i.e* 1980-2006. Since 15 States are considered in the study, for each State there is a set of two variables. Thus there are 15×2 data

series in the panel. The period of time in the study is twenty-four years. If there are no missing data, we can expect that the number of data point to be 15×2× 24 = 720 in the panel data set. But there are missing data particularly in the dependent variables, so we adjusted according to available data of dependent variable which are seen in the following.

Public expenditure on education and health are collected from the year 1980 to 2006 in which the year 1985 is not available and measured in nominal values.

Per capita income is collected from 1980 to 2004 at constant prices.

Literacy Rate data collected for the years 1981, 1991 and 2001 and measured in terms of percentage.

Gross enrolment ratio data is collected from 1994 to 2004. This is used for continuous data for 11 years and measured in the ratios.

For the dropout rates, the data collected for the period 1994-2004 and measured in percentage.

Life expectancy at birth for both males and females the periods used for analysis is 1991-95 to 2001-06. Life expectancy at birth is computed only quinquennially.

Infant mortality rate and Crude death rate the data collected from 1981 to 2006 and measure in terms of 1000 per live births where as crude death is measured in terms of percentage.

Child mortality rate is collected from 1990 to 2000 and measured 1000 per live births.

4.4.2 Data and Data Sources

(a) The data collected for public expenditure on education and health from *Finance Accounts GOI*. The reported data covered 15 State government's expenditure on various components of social services, including education and health. The expenditure data is mainly based on the Finance Accounts of the States from 1980 to 2006. It uses data from *Budget Documents* of States for detailed analysis of expenditure under different heads for the years 2007-08 and 2008-09. It also uses information from the *Annual Financial Statement and Budget At a Glance* published by the Finance Department, Government of the States as well as data released by the *Twelfth Finance Commission*. The per capita income data (1980-2004) is collected from the *Directorate of Economics & Statistics of respective State Governments, and for All-India -- CSO.*

(b) Literacy Rate, the data was collected from *Census-1981, 1991, 2001*.

(c) Gross enrolment ratios and drop-out rates are collected from the "*Selected Educational Statistics, Ministry of Human Resource Development, Government of India", various issues* and *the website www.indiastat.com.*

(d) In case of health outcome indicators the main source is *the Registrar General's Office's Sample Registration Scheme* and the others are *Economic Surveys*.

4.4.3 Data limitations

Data limitations prevent adding other explanatory variables for socio-economic characteristics that may affect indicators of education attainment and health status. In particular, private spending on both education and health is omitted due to a lack of

data (Psachorapoulos & Nguyen, 1997). Filmer, Hammer & Pritchett (1998) proposed including other demand factors, such as income distribution in the regressions for both education and health. Unfortunately data are not available for a large enough sample. Similarly, data limitations prevent including outcome indicators like repetition rates, completion rates, maternal mortality rates etc.

4.4.4 Measurement of dependent and independent variables

The dependent variables are literacy rate, gross enrolment ratio, drop-out rates, life expectancy at birth for males, life expectancy at birth for females, infant mortality rate, child mortality rate and crude death rate. The independent variables are public expenditure on education, public expenditure on health and per capita income. The measurements of dependent variables and independent variables are discussed in the following sub-sections.

4.4.4.1 Literacy Rate

The level of literacy is, perhaps, the most important index of development of a society. Whether a country should have a higher rate of basic literacy through formal channels or non-formal channels is not important. But a country should try to attempt for higher level of literacy is the point. This is almost universally accepted. Literacy rate(above 7 years) is defined as the ability to identify , understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts. Literacy Rate was calculated for the entire population aged 7 and over in percentages.

4.4.4.2 Gross Enrolment Ratio

Gross enrolment ratio measure the number of primary school students as a proportion of the primary school-age-going population.

$$GER = \frac{\text{Total enrolment in primary education}}{\text{Population in age-group e}} \times 100$$

e = the age-group of the population eligible to participate in primary education according to national regulations.

4.4.4.3 Drop-out Rate

One of the important indicators of educational development is the drop out rate in our study we have taken data for primary classes. It is defined as follows

$$\text{Drop-out Rate } (d)_g^t = \frac{D_g^t}{E_g^t} \times 100$$

$$= \frac{number of students dropping out from grade 'g' in year t}{E_g^t} \times 100$$

D = number of students dropping out from grade ‘g’ in year‘t’

E = enrolled in a particular class at n year

4.4.4.4 Life expectancy at birth for both males and females

Life expectancy at birth or longevity is an overall indicator of the economic and social well-being of the people. As a society advances, the life expectancy of its people also increases. It is defined as the average number of years that a new born could expect to live, if he or she were to pass through life subject to the age-specific

death rates of a given period. Since Life expectancy at birth (LEB) is computed only quinquennially. In this study we have taken for both males and females separately for the regressions. It is measured in years.

4.4.4.5 Infant Mortality Rate

An important indicator of the quality of health care in a society is the infant mortality rate (IMR). Infant mortality rate is defined as the number infant's deaths of below one year of age per 1000 live births. It is regarded as an important and sensitive indicator of the health status of a community. It also reflects the general standard of living of the people and effectiveness of interventions for improving maternal and child health in a country. Compared to other indicators like crude birth rate, maternal mortality rate and under-five mortality rate etc., this indicator has always been accorded greater importance by the public health specialists because infant mortality is the single, largest category of mortality. It is measured in terms of 1000 per live births in that particular year.

4.4.4.6 Child Mortality Rate

Child mortality rate is defined as probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates. It is measured in terms of 1000 per live births in that particular year.

4.4.4.7 Crude Death Rate

Crude death rate is the number of deaths during a year 1000 persons in the mid-population

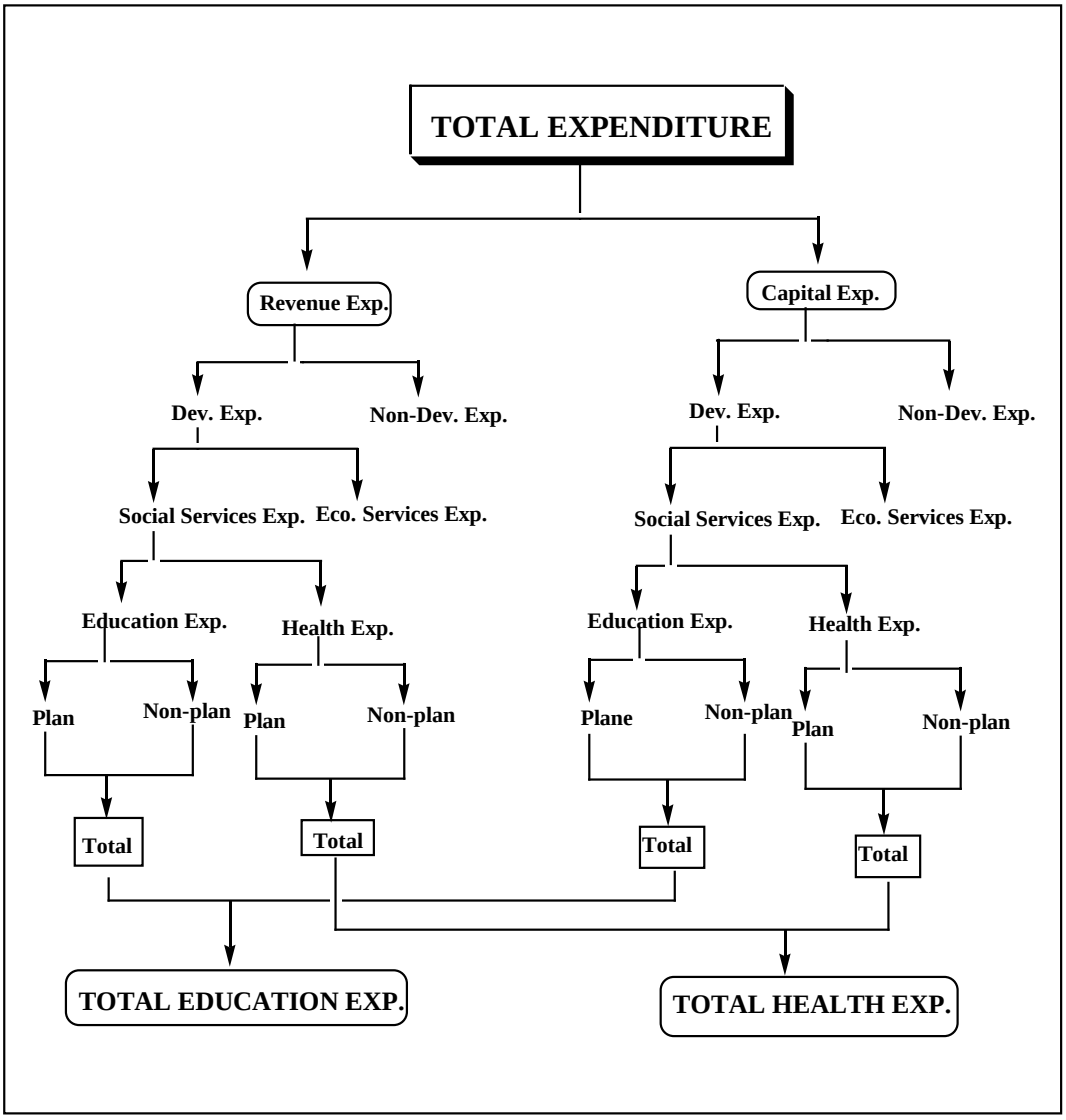
Crude Death Rate = Number of deaths in a given year/Population at middle of the year.

It is measured in percentage.

4.4.4.8 Public Expenditure on Education and Public Expenditure on Health

Total expenditure on education includes revenue expenditure and capital expenditure. Public expenditure comprises Education, Sports, Art and Culture. Total expenditure on health includes revenue expenditure and capital expenditure. Public expenditure comprises Medical and Public Health. It is measured in absolute values. A clear explanation is done in the Figure 4.1

Figure-4.1Classification of the total expenditure on Education and Health



Souce RBI

4.4.4.9 Per Capita Income

Although the per capita income variable is not among the conventional variables included in impact models, there are some advantages of using per capita income variable over population variable. The per capita income variable not only valuable in revealing economic capacity of the social serving States but also valuable in revealing economic capacity of the social servicing States and also the wealth of the population. While the aggregate income variable in the model relate to the impacts capacity. The per capita income variable in turn has the capacity of purchasing power and the ability to demand goods and services. Unlike the population variables, which relate to the quantitative side, the per capita income relates to the qualitative side. Another advantage is that coefficient of the per capita income in the model with log-log transformation of the data would indicate the average for public service goods across the population. For the expected impact of per capita income on social services we should be more cautious if we went to keep our expectation in line with the results of some previous studies. They should be viewed as adhoc results rather than universally applicable theory. We make the following assumptions about the impact of the per capita income variable on social services particularly education and health. It is acceptable that country's per capita income would have a positive impact on social services outcomes. Following this argument we expect that the State's per capita income would have a positive impact on social services both on education and health indicators. It measured in absolute values.

4.5 Conclusion

We determined that the fixed effect model is the best and viable model for cross section-time series (panel) data in estimating the State specific model. We also made necessary adjustments to the variables for practical and empirical purposes. We finally came up with an empirical model, which is ready to be estimated for testing our hypothesis of the impact of public expenditure on social sectors (education and health) among 15 major States of India.

Before we can test our hypothesis, the accuracy and quality of our data are critical. Therefore, in this chapter we have discussed the preparation of data, documented the sources of data, measurement of dependent and independent variables for the results of the estimates and their meaningful interpretations.

From the above arguments we are unsure about which effect (either positive or negative) is stronger so we cannot assign a prior expectation for the impact of the both public expenditure and per capita income variables on social services particularly on education and health sectors. This analysis is done by using fixed effects model in the next chapter.

CHAPTER 5

ECONOMETRIC ANALYSIS OF PUBLIC EXPENDITURE AND SOCIAL SERVICE SECTORS RELATIONSHIP

5.1 Introduction

We are now to perform panel data analysis using the model, which was developed in Chapter 4. The major focus of Chapter 5 is the evaluation of the impact of public expenditure on education and health outcomes. In Section 5.2, we will test whether pooling the time series data across States can enhance the performance of the model over individual regressions for each State to see whether advantages of using panel data can benefit this study. Section 5.3 performs panel serial correlation tests between public expenditure and outcome indicators for both education and health models. Sections 5.4 & 5.5 represent the regression model for the study and analysis to investigate the effects for the outcome indicators for both education and health. Section 5.6 analyzed the determining factors for each outcome indicators. Section 5.7 summing-up and conclusion.

5.2 The Poolability Tests

In this section, we examine whether the data should be pooled in the first place, or put it differently, whether pooling cross-section and time series into one data set can improve

the explanatory power over the un-pooled data. To see whether pooling is better than not pooling, we will perform the poolability analyses described in the ensuing sub-section 5.2.1.

5.2.1 Pooled by the Fixed Effect or LSDV Model

In the Chapter 4, we presented a number of arguments to support the Fixed Effect panel regression model and we came up with the conclusion that the Fixed Effect Model should be used. To test whether the Fixed Effect Model should be used, we can test the joint significance of the dummy variables. The test can be performed by the F-test with the pooled OLS model being the restricted model and the Fixed Effects model being the unrestricted model (Baltagi, 2005, p. 13, see section 4.3.6).

Table 5.1 F-test for the Fixed Effects

	LIT	**GER**	**DOR**	**LEBM**	**LEBF**	**IMR**	**CMR**	**CDR**
RRSS	1.607	1.811	41.366	0.401	0.614	51.757	39.035	8.7
URSS	0.303	0.17	21.447	0.021	0.040	3.225	0.759	1.63
df1	42	72	138	162	162	327	162	327
df2	29	59	125	149	149	314	149	314
F-stat	9.602	41.594	8.930	203.63	161.45	363.44	577.544	104.76
F-critical*	2.84	2.50	2.84	2.27	2.27	2.18	2.34	2.18
Ho	Reject	Reject	Reject	Reject	Reject	Reject	Reject	Reject

At 1% significant

The F-tests results are presented in Table 5.1 for both Education and Health variables. The F statistics for all indicators of education and health are significantly higher than the

F critical value and are significant at 1% level. This suggests that the null hypothesis of OLS panel model can be rejected and the test is in favour of the fixed effect model.

5.3 Serial Correlation Tests

Table 5.2 Baltagi-Wu LBI test for Fixed Effects

S.No.	Dependent Variables	Baltagi-Wu LBI statistic
1	**Literacy Rate**	2.11
2	**Gross Enrolment Ratio**	1.504
3	**Drop-out Rates**	1.819
4	**Life Expectancy at Birth for Males**	1.615
5	**Life Expectancy at Birth for Females**	1.852
6	**Infant Mortality Rate**	2.264
7	**Child Mortality Rate**	1.831
8	**Crude Death Rate**	2.219

The second question is the problem of serial correlation. The Baltagi-Wu LBI statistic presented in the Table 5.2 for all eight outcome indicators and the test statistics reject the null hypothesis of no first-order serial correlation.

5.4 Specification of the Model

The model is specified with total expenditure on education or health and per capita income as regressors. It is generally observed that the human development is positively

correlated to the income levels of the States. However, the question we are interested is, how effective the expenditure by government on social sectors like education and health in attaining better levels of human development. The model thus is specified in the following form: (See 4.3.1 to 4.3.6)

$$\mathbf{ln(Y_{it}) = \alpha_i + \beta_1 ln(EXP_{it}) + \beta_2 ln(PCI_{it}) + u_{it} \ldots\ldots\ldots\ldots\ldots (5.1)}$$

Y_{it} = Dependent variables of the education or health indicators of the State i at time t

EXP_{it} = Total expenditure on education or health of the State i at time t

PCI_{it} = Per capita income of the State i at time t

Ln = Natural logarithm

u_{it} = The panel error term

α_i = State- Specific intercepts

For the intercept dummy variables, to avoid dummy variable trap, we dropped one intercept for Kerala. There are no a priori expectations for all other intercept dummies to be higher or lower, compared with Kerala. Here there is no dummy for Kerala. In other words, α_i represents the intercept of Kerala.

5.5 Econometric Results

In Section 5.2.1, we have gone through some steps to test the poolability of the data and found that the data are poolable with a fixed effect. In Section 5.4, we presented the panel data LSDV model. In this section we examined the impact of public expenditure on education and health outcome indicators through the method described in the equation

5.1. In this exercise we first wish to examine the impact of public education expenditure and per capita income on each education outcome indicators and the variations of the parameters coefficients across the States. Secondly, we examine the impact of public health expenditure and per capita income on each health outcome indicators and variations in parameter coefficients.

Before we move on to the interpretation of estimated regression, for convenience, we state the expectations of the expenditure and per capita income on dependent variables. For the literacy rate, it is expected that total expenditure on education and per capita income variables for the States are positively related. For the gross enrolment ratio the expected sign is not clear in case of public spending, in case of per capita income it is expected to be positively related to the gross enrolment ratio. The public spending and per capita income are expected to have a negative relation with drop-out rates which means lowest estimated coefficients has highest impact. The variable for life expectancy at birth for males and females is expected to be positive relation with both public spending on health and per capita income. In case of infant mortality rate, child mortality rate, crude death rates are expected to be negative relation with public expenditure on health and per capita income.

5. 5.1 Literacy Rate

The estimated results of literacy rate are included in Table 5.3. The variables are significant at 1% on literacy rate with expected positive sign. The regressions are estimated in log-log format, and the estimated coefficients are interpreted as the

elasticity, that is the percentage change in the variable literacy rate due to a 1% increase in the corresponding explanatory variables. The intercept value of about 2.69%, mechanically interpreted, means that if the values of expenditure and per capita income rate were fixed at zero, the mean of the 15 States literacy rate would be about 2.69%. Over the period of the years 1981, 1991 and 2001 across 15 States, the literacy rate are largely dependent on the per capita income of the States (*i.e*. 0.1384% increase in literacy rate is associated with 1% increase in per capita income). It is the strongest elasticity amongst the variables in the whole regression equation. States literacy rate are positively related to total expenditure on education with an elasticity of 0.0543 means that, for every 1% increase in expenditure, States literacy rate on average increase by 0.0543 %.

Table 5.3 Effect of Public Expenditure on Education and Per Capita Income on literacy Rate

Variable	**Coefficient**	**Std. Err.**	**t-Statistic**	**Prob.**
Total Exp. on Education	0.054	0.01	(2.86)***	0.019
Per Capita Income	0.138	0.03	(3.83)***	0.000
Constant	2.696	0.18	(14.47)***	0.000
R^2	0.91			
adj R^2	0.89			
No. of Groups	15			
Total no. of observations	45			

denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

Table 5.4 Estimated Coefficients for Dummy Variables for Literacy Rate						
S.No.	**States**	**Coeff.**	**Std. Err.**	**t-value**	**p-value**	**Rank**
1	**Andhra Pradesh**	2.179	0.08	(7.77)***	0.000	12
2	**Assam**	2.553	0.08	(5.78)***	0.000	10
3	**Bihar**	2.191	0.08	(8.70)***	0.000	15
4	**Gujarat**	2.397	0.08	(4.73)***	0.000	4
5	**Haryana**	2.392	0.08	(4.46)***	0.000	6
6	**Karnataka**	2.334	0.08	(5.47)***	0.000	8
7	**Kerala**	2.697	0.02	(14.47)***	0.000	1
8	**Madhya Pradesh**	2.232	0.08	(6.56)***	0.000	11
9	**Maharastra**	2.456	0.08	(4.04)***	0.000	2
10	**Orissa**	2.343	0.08	(5.51)***	0.000	9
11	**Punjab**	2.406	0.08	(4.43)***	0.000	5
12	**Rajasthan**	2.125	0.08	(8.42)***	0.000	14
13	**Tamil Nadu**	2.450	0.08	(4.23)***	0.000	3
14	**Uttar Pradesh**	2.210	0.08	(7.88)***	0.000	13
15	**West Bengal**	2.443	0.08	(5.13)***	0.000	7

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.(-) indicates less than.***

From the Table 5.4 reveals the estimated impact of 15 States for literacy rate. The higher impact is seen in the States Kerala, followed by Maharastra, Tamil Nadu, Gujarat. The States Haryana, West Bengal, Karnataka, Orissa, and Assam showed medium impact where as Madhya Pradesh, Andhra Pradesh, Uttar Pradesh, Rajasthan and Assam showed low impact.

5.5.2 Gross Enrolment Ratio

Table 5.5 Effect of Public Expenditure on Education and Per Capita Income on Gross Enrolment Ratio				
Variable	**Coefficient**	**Std. Err.**	**t-Statistic**	**Prob.**
Total Exp. on Education	-0.013	0.01	-1.04	0.304
Per Capita Income	0.186	0.06	(2.95)***	0.005
Constant	2.959	0.51	(5.69)***	0.000
R^2	0.91			
Adj. R^2	0.89			
No. of Groups	15			
Total no. of observations	165			

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.***

Gross enrolment ratio is negatively related to the total public expenditure with an elasticity of -0.013 (Table 5.5). The elasticity of -0.013 means 1 % increase in expenditure on education on average of 15 States gross enrolment ratio decreases by 0.0132 %. Although the elasticity is low and in fact is inelastic, the negative relation is somewhat surprising and unexpected in the model. Other possible explanation is that per capita income of the States has a positive impact on gross enrolment ratio, with an elasticity of 0.187. The t-statistic is 3 which means significant at 1% level. This result can be interpreted as the 1% of increase in per capita income lead to 0.187% points of increase in gross enrolment ratio. As the result reveals that per capita income has more impact on gross enrolment ratio than public expenditure on education.

Table 5.6 Estimated Coefficients for Dummy Variables for Gross Enrolment Ratio

S.No.	States	Coeff.	Std. Err	t-value	p-value	Rank
1	**Andhra Pradesh**	2.944	0.03	(2.94)***	0.005	11
2	**Assam**	3.178	0.04	(6.95)***	0.000	2
3	**Bihar**	2.936	0.09	(1.14)*	0.258	12
4	**Gujarat**	3.101	0.03	(7.62)***	0.000	4
5	**Haryana**	2.690	0.05	(-2.77)***	0.008	13
6	**Karnataka**	3.076	0.03	(6.75)***	0.000	5
7	**Kerala**	2.832	0.06	(5.28)***	0.000	1
8	**Madhya Pradesh**	3.109	0.04	(6.04)***	0.000	3
9	**Maharastra**	3.047	0.03	(5.78)***	0.000	9
10	**Orissa**	3.066	0.05	(4.4)***	0.000	6
11	**Punjab**	2.682	0.04	(-3.23)***	0.002	14
12	**Rajasthan**	3.053	0.04	(5.28)***	0.000	7
13	**Tamil Nadu**	3.053	0.03	(4.67)***	0.000	8
14	**Uttar Pradesh**	2.676	0.06	(-2.56)***	0.013	15
15	**West Bengal**	2.998	0.03	(4.18)***	0.000	10

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.(-) indicates less than***

The estimated dummy coefficients reveal that the impact of the 15 States of India on gross enrolment ratio which is seen in the Table 5.6. The higher impact on gross enrolment ratio is seen in the States Assam, Madhya Pradesh, Gujarat, Karnataka and Orissa where as lower impact is seen in the States Bihar, Kerala, Haryana, Punjab, and

Uttar Pradesh. The States Rajasthan, Maharastra, Tamil Nadu, West Bengal and Andhra Pradesh showed medium impact on gross enrolment ratio.

5.5.3 Drop-out rates

Table 5.7 Effect of Public Expenditure on Education and Per Capita Income on Dropout Rates

Variable	Coefficient	Std. Err.	t-Statistic	Prob.
Total Exp. on Education	-0.005	0.05	-0.101	0.918
Per Capita Income	-0.464	0.11	(-3.93)***	0.000
Constant	4.750	0.62	(7.57)***	0.000
R^2	0.82			
Adj. R^2	0.80			
No. of Groups	15			
Total no. of observations	150			

denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

The fixed effects estimated results on drop-out rates are presented in (Table 5.7). The coefficient of public education expenditure on drop-outs rates is -0.005. It means that drop-out rates decreased by 0.005% points per increase in public education expenditure. But the t-statistic is only -0.101. It means that it is not statistically significant. In short public expenditure on education doesn't have any influence on the dropout rates. In the same way dropout rates declined by -0.464 % points per unit increase in per capita income. The coefficient is significant at 1 % level with t-statistic -3.93. It means when 1 % increases in per capita income there is 0.464 % point's reduction in dropout rates. The per capita income has more impact than public expenditure on drop-out rates.

Table 5.8 Estimated Coefficients of Dummy Variables for Drop-out rates.						
S.No.	**States**	**Coeff.**	**Std. Err.**	**t-value**	**p-value**	**Rank**
1	**Andhra Pradesh**	8.020	0.20	(16.63)***	0.000	13
2	**Assam**	7.908	0.20	(15.99)***	0.000	11
3	**Bihar**	7.935	0.23	(13.86)***	0.000	12
4	**Gujarat**	7.818	0.20	(15.59)***	0.000	10
5	**Haryana**	7.083	0.23	(10.17)***	0.000	3
6	**Karnataka**	7.546	0.20	(14.31)***	0.000	7
7	**Kerala**	4.750	0.60	(7.84)***	0.000	1
8	**Madhya Pradesh**	7.434	0.20	(13.61)***	0.000	5
9	**Maharashtra**	7.326	0.20	(13.08)***	0.000	4
10	**Orissa**	7.780	0.20	(15.2)***	0.000	9
11	**Punjab**	7.639	0.21	(13.52)***	0.000	8
12	**Rajasthan**	8.197	0.20	(17.44)***	0.000	15
13	**Tamil Nadu**	6.984	0.20	(11.41)***	0.000	2
14	**Uttar Pradesh**	7.517	0.22	(12.47)***	0.000	6
15	**West Bengal**	8.066	0.20	(16.81)***	0.000	14

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.***

The Table 5.8 showed the impact analysis on drop-out rates between the 15 States of India. Rajasthan, West Bengal, Andhra Pradesh, Bihar and Assam showed lower impact on drop-out rates. The impact is higher in the States Madhya Pradesh, Maharastra, Haryana, Tamil Nadu and Kerala. The medium impact is seen in the States like Gujarat, Orissa, Rajasthan, Karnataka and Uttar Pradesh.

5.5.4 Life Expectancy at Birth for Males

Table 5.9 Effect of Public Expenditure on Health and Per Capita Income on Life Expectancy at Birth for Males				
Variable	**Coefficient**	**Std. Err.**	**t-Statistic**	**Prob.**
Total Exp. on Health	0.028	0.00	(7.83)***	0.000
Per Capita Income	0.014	0.01	(1.86)***	0.035
Constant	3.825	0.04	(92.61)***	0.000
R^2	0.98			
adj R^2	0.97			
No. of Groups	15			
Total no. of observations	165			

denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

The (Table 5.9) present the impact results of public expenditure on health and per capita income on life expectancy at birth for males. The results showed that the public expenditure on health has a strong positive and highly significant on life expectancy at birth for males. The coefficient of public health expenditure on life expectancy for males is 0.028 and the t-statistic is 7.83 (significant at 1 % level). Keeping the per capita income constant, 1 % increase in public health expenditure led to an increase 2.87 years in the life expectancy at birth for males. Per capita income has a positive and significant (1% level) effect on life expectancy at birth for males. The coefficient of per capita income is 0.014. The t-statistic is 1.86; it is statistically significant at 1% level. It means that 0.014 % points increase in life expectancy at birth for males for 1 % increase in per

capita income. According to the results, public expenditure on health is more significant than per capita income.

Table 5.10 Estimated Coefficients for Dummy Variables for Life Expectancy at Birth for Males

S.No.	States	Coeff.	Std. Err.	t-value	p-value	Rank
1	**Andhra Pradesh**	3.676	0.00	(34.38)***	0.000	10
2	**Assam**	3.639	0.00	(44.56)***	0.000	13
3	**Bihar**	3.692	0.01	(15.88)***	0.000	7
4	**Gujarat**	3.681	0.00	(34.91)***	0.000	9
5	**Haryana**	3.751	0.01	(11.18)***	0.000	3
6	**Karnataka**	3.690	0.00	(34.46)***	0.000	8
7	**Kerala**	3.826	0.00	(92.61)***	0.000	1
8	**Madhya Pradesh**	3.600	0.00	(48.34)***	0.000	15
9	**Maharastra**	3.708	0.00	(28.19)***	0.000	5
10	**Orissa**	3.649	0.00	(37.62)***	0.000	12
11	**Punjab**	3.777	0.01	(8.65)***	0.000	2
12	**Rajasthan**	3.657	0.00	(38.17)***	0.000	11
13	**Tamil Nadu**	3.709	0.00	(28.90)***	0.000	4
14	**Uttar Pradesh**	3.633	0.01	(24.89)***	0.000	14
15	**West Bengal**	3.698	0.00	(27.04)***	0.000	6

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1 % level.***

The Table (5.10) reveals that the efficiency of dummy estimated coefficients for life expectancy at birth for males for each 15 States. All 15 States are compared with higher,

medium and lower impacts on life expectancy at birth for males which can be clearly seen from the table. The impact on life expectancy at birth is higher in Kerala, Punjab, Haryana, Tamil Nadu and Maharastra. The medium impact is seen in the States Bihar, West Benal, Karnataka, Gujarat and Andhra Pradesh. The lower impact on life expectancy at Birth is seen in the States Rajasthan, Orissa, Uttar Pradesh, Assam and Madhya Pradesh

5.5.5 Life Expectancy at Birth for Females

Table 5.11 Effect of Public Expenditure on Health and Per Capita Income on Life Expectancy at Birth for Females

Variable	Coeff.	Std. Err.	t-Statistic	Prob.
Total Exp. on Health	0.0265	0.0060	(4.34)***	0.000
Per Capita Income	0.0195	0.0140	(1.52)*	0.130
Constant	3.87	0.06	(56.17)***	
R^2	0.96			
Adj. R^2	0.96			
No. of Groups	15			
Total no. of observations	165			

**** denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.***

Here life expectancy at birth for females is given as a function of public expenditure on health and per capita income and the results are shown in (Table 5.11). The coefficient of public expenditure on health is 0.026. It means that life expectancy at birth for females increased by 0.025 % points per 1% in public expenditure on health. The t-statistic is

4.34, which means it is statistically significant at 1% level. In short public expenditure on health has influence on life expectancy at birth for females. In the same way life expectancy at birth for females increased by 0.0195 % points per 10 % increase in per capita income. The coefficient is significant at 10 % level. The impact of public expenditure on health is more than the per capita income in the case of life expectancy at birth for females.

The Table 5.12 reveals the dummy estimated coefficients for life expectancy at birth for females for each State. All 15 States are compared with their impacts on life expectancy at birth for females by the explanatory variables. The lower impact on life expectancy at birth for females is seen in the States Rajasthan, Assam, Orissa, Uttar Pradesh and Madhya Pradesh. The medium impact is seen in the States Karnataka, West Bengal, Andhra Pradesh, Gujarat and Bihar on life expectancy at birth for females. Finally, the States with highest impact on life expectancy at birth for females are seen in Kerala, Punjab, Haryana, Maharashtra and Tamil Nadu.

Table 5.12 Estimated Coefficients for Dummy Variables for Life Expectancy at Birth for Females						
S.No.	**States**	**Coeff.**	**Std. Err.**	**t-value**	**p-value**	**Rank**
1	**Andhra Pradesh**	3.692	0.0734	(50.11)***	0.000	8
2	**Assam**	3.626	0.0728	(49.62)***	0.000	12
3	**Bihar**	3.646	0.0638	(57.08)***	0.000	11
4	**Gujarat**	3.684	0.0783	(46.88)***	0.000	9
5	**Haryana**	3.742	0.0832	(44.84)***	0.000	3
6	**Karnataka**	3.718	0.0753	(49.23)***	0.000	6
7	**Kerala**	3.861	0.0756	(51.04)***	0.000	1
8	**Madhya Pradesh**	3.572	0.0718	(49.58)***	0.000	15
9	**Maharastra**	3.722	0.0776	(47.83)***	0.000	4
10	**Orissa**	3.625	0.0708	(51.04)***	0.000	13
11	**Punjab**	3.782	0.0821	(45.93)***	0.000	2
12	**Rajasthan**	3.651	0.0726	(50.10)***	0.000	10
13	**Tamil Nadu**	3.718	0.0755	(49.07)***	0.000	5
14	**Uttar Pradesh**	3.599	0.0668	(53.69)***	0.000	14
15	**West Bengal**	3.702	0.0725	(50.87)***	0.000	7

****** denotes statistically significant at the 1 percent level.***

5.5.6 Infant Mortality Rate

Table 5.13 Effect of Public Expenditure on Health and Per Capita Income on Infant Mortality Rate				
Variable	**Coeff.**	**Std. Err.**	**t-Statistic**	**Prob.**
Total Exp. on Health	-0.045	0.02	(-1.71)***	0.011
Per Capita Income	-0.226	0.03	(-6.41)***	0.000
Constant	5.32	0.08	(63.62)***	0.000
R^2	0.95			
Adj. R^2	0.95			
No. of Groups	15			
Total no. of observations	330			

****denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.***

The estimated results for the 15 States are reported in Table 5.13. If our hypothesis holds, the result of these groups of States show that per capita income is more effective on IMRs than the public expenditure on health. Indeed, we find that public health expenditure is significant, at the 1% level with the correct negative sign. Furthermore, per capita income is significant at 1% level. The results showed that a 1 % increase in public health expenditure on health leads to 0.045 % points decrease in IMRs. Per capita income is highly significant at the 1% level that is 1% increase in per capita income cause 0.22 % decrease in IMRs.

Table 5.14 Estimated Coefficients for Dummy Variables for Infant Mortality Rate						
S.No.	**States**	**Coeff.**	**Std. Err.**	**t-value**	**p-value**	**Rank**
1	**Andhra Pradesh**	6.669	0.03	(41.22)***	0.000	9
2	**Assam**	6.737	0.03	(43.69)***	0.000	10
3	**Bihar**	6.606	0.04	(31.77)***	0.000	2
4	**Gujarat**	6.800	0.03	(47.23)***	0.000	8
5	**Haryana**	6.777	0.05	(30.67)***	0.000	11
7.	**Kerala**	5.382	0.06	(63.62)***	0.000	1
6	**Karnataka**	6.589	0.03	(40.86)***	0.000	7
8	**Madhya Pradesh**	7.028	0.03	(51.18)***	0.000	15
9	**Maharastra**	6.578	0.03	(39.00)***	0.000	5
10	**Orissa**	6.989	0.03	(53.79)***	0.000	14
11	**Punjab**	6.575	0.04	(32.17)***	0.000	4
12	**Rajasthan**	6.860	0.03	(47.57)***	0.000	12
13	**Tamil Nadu**	6.579	0.03	(38.50)***	0.000	3
14	**Uttar Pradesh**	7.000	0.05	(35.78)***	0.000	13
15	**West Bengal**	6.589	0.03	(36.02)***	0.000	6

****** denotes statistically significant at the 1 percent level.***

The estimated coefficient in Table 5.14 reveals that, the impact differences in infant mortality rates with respected States. The estimated coefficients with highest impact are found in the States Kerala, Punjab, Maharashtra, Tamil Nadu and West Bengal. The States Karnataka, Bihar, Andhra Pradesh, Assam and Haryana showed medium impact on

infant mortality rates. The lower effectiveness is seen in the States Gujarat, Rajasthan, Orissa, Uttar Pradesh and Madhya Pradesh.

5.5.7. Child Mortality Rate

Table 5.15 Effect of Public Expenditure on Health and Per Capita Income on Child Mortality Rate

Variable	Coefficient	Std. Err.	t-Statistic	Prob.
Total Exp. on Health	-0.135	0.02	(-4.74)***	0.000
Per Capita Income	-0.160	0.05	(-3.14)***	0.002
Constant	4.166	.23	(24.7)***	0.000
R^2	0.98			
Adj. R^2	0.98			
No. of Groups	15			
Total no. of observations	165			

denotes significant at 10% level; ** significant at 5% level; *** significant at 1% level.

The function of public expenditure on health and per capita income on child mortality rate results are given in the (Table 5.15). The results showed that public expenditure on health is significant. The coefficient of public expenditure on health is -0.135. The t-statistic is -4.74 which is statistically significant at 1 % level. It means that 1 percentage increase in public expenditure on health will cause 0.13 % decrease in child mortality rate. As expected, per capita income is highly significant at 1 % level in the fixed effects regressions with correct negative sign. In this case the coefficient is -0.166 and t-statistic is -3.14 which is statistically significant at 1 % level. It means that1 percentage increase

in per capita income will reduce 0.19 % points of child mortality rate. According to our hypothesis, the results showed that per capita income on health has more impact on child mortality rate though public expenditure is significant.

Table 5.16 Estimated Coefficients for Dummy Variables for Child Mortality Rate

S.No.	States	Coeff.	Std. Err.	t-value	p-value	Rank
1	**Andhra Pradesh**	5.805	0.03	(48.54)***	0.000	6
2	**Assam**	5.995	0.03	(57.4)***	0.000	12
3	**Bihar**	5.911	0.05	(30.88)***	0.000	9
4	**Gujarat**	5.977	0.03	(56.58)***	0.000	11
5	**Haryana**	5.871	0.05	(33.22)***	0.000	10
6	**Karnataka**	5.803	0.03	(52.71)***	0.000	7
7	**Kerala**	4.166	0.24	(17.00)***	0.000	1
8	**Madhya Pradesh**	6.392	0.03	(62.9)***	0.000	15
9	**Maharastra**	5.653	0.03	(45.42)***	0.000	3
10	**Orissa**	6.148	0.03	(58.31)***	0.000	8
11	**Punjab**	5.669	0.04	(35.22)***	0.000	4
12	**Rajasthan**	6.211	0.03	(60.65)***	0.000	13
13	**Tamil Nadu**	5.591	0.03	(44.1)***	0.000	2
14	**Uttar Pradesh**	6.366	0.05	(39.16)***	0.000	14
15	**West Bengal**	5.765	0.03	(43.67)***	0.000	5

****** denotes statistically significant at the 1 percent level.***

The Table 5.16 presents the effectiveness of public expenditure on health and per capita income on child mortality rate. The results showed that Kerala, Tamil Nadu, Maharashtra, Punjab and West Bengal had high impact on child mortality rate where as Karnataka, Andhra Pradesh, Haryana, Bihar and Gujarat with medium impact. The States Assam, Orissa, Rajasthan, Uttar Pradesh and Madhya Pradesh showed lower impact on child mortality rate.

5.5.8 Crude Death Rate

Table 5.17 Effect of Public Expenditure on Health and Per Capita Income on Crude Death Rate

Variable	Coefficient	Std. Err.	t-Statistic	Prob.
Total Exp. on Health	-0.0939	0.0188	(-4.99)***	0.000
Per Capita Income	-0.0602	0.0251	(-2.39)***	0.017
Constant	3.2871	0.0595	(55.19)***	0.000
R^2	0.90			
adj R^2	0.90			
No. of Groups	15			
Total no. of observations	330			

**** denotes significant at 10% level; ** significant at 5% level; *** significant at 1%***

The crude death rate is given as function of public expenditure on health and per capita income and the results are presented in (Table 5.17). The coefficient of public expenditure on health is -0.0939. It means that crude death rates decrease by -0.0939 % points per 1 % increase in public expenditure on health. The t-statistic is -4.99; it is

statistically significant at 1% level. Here that the public expenditure on health has influence on crude death rate. In the same way crude death rate also decrease by -0.0602 % points with 1% increase in per capita income.

Table 5.18 Estimated Coefficients for Dummy Variables for Crude Death Rate

S.No.	States	Coeff.	Std. Err.	t-value	p-value	Rank
1	**Andhra Pradesh**	3.706	0.05	(64.67)***	0.000	9
2	**Assam**	3.734	0.06	(61.31)***	0.000	10
3	**Bihar**	3.807	0.05	(73.41)***	0.000	12
4	**Gujarat**	3.694	0.06	(59.05)***	0.000	7
5	**Haryana**	3.544	0.07	(47.89)***	0.000	3
7	**Kerala**	3.287	0.05	(55.18)***	0.000	1
6	**Karnataka**	3.593	0.05	(60.80)***	0.000	4
8	**Madhya Pradesh**	3.981	0.05	(71.05)***	0.000	14
9	**Maharastra**	3.639	0.06	(60.25)***	0.000	6
10	**Orissa**	3.855	0.05	(67.80)***	0.000	13
11	**Punjab**	3.529	0.06	(50.83)***	0.000	2
12	**Rajasthan**	3.787	0.05	(66.87)***	0.000	11
13	**Tamil Nadu**	3.701	0.05	(63.56)***	0.000	8
14	**Uttar Pradesh**	4.018	0.05	(74.05)***	0.000	15
15	**West Bengal**	3.632	0.05	(64.02)***	0.000	5

****** denotes statistically significant at the 1 percent level.***

In Table 5.18 we analyse the States dummy coefficients which reveals the effectiveness on crude death rate. The results showed that the impact on crude death rate is higher in the States Kerala, Punjab, Haryana, Karnataka and West Bengal. The medium impact is seen in the States like Maharashtra, Gujarat, Tamil Nadu, Andhra Pradesh, and Assam. The lower impact on crude death rate is seen in the States Rajasthan, Bihar, Orissa, Madhya Pradesh and Uttar Pradesh.

5.6 The Determining factors for each Outcome Indicators

In this section we consider an important point is that whether the impact of public expenditure and per capita income of the 15 States on outcome indicators is determined or not. For example to see whether highest impact on outcome indicators by a particular State is through high per capita income or high expenditure or other things. For this we had divided the impacts into three types for the States on each outcome indicators according to their highest efficient coefficients. The ranking from 1 to 5 States as highest impact where as States ranking from 6 to 10 considered as medium impact. The States ranking from 7 to 15 are considered as lower impact. In case of per capita income average growth rates are used for ranking the 15 States. States with highest ranking from 1 to 5 are considered as high per capita income States followed by middle income States ranking from 6-10. The States with lower income ranking from 7-15 are considered with low per capita income. This same procedure is done for education and health expenditures (See Appendix to Chapter-5). This impact analysis determination is clearly done in the following tables for each outcome indicators.

5.6.1 Impact analysis on Literacy Rate

The Table 5.19 showed the States with high expenditure and high per capita income had a very good impact on literacy rate is seen in Maharashtra and Tamil Nadu. The only State with high per capita income and high impact is seen in Punjab. The States West Bengal, Karnataka, Assam, Haryana showing medium impact either by medium expenditure or medium per capita income. The States showing low impact on literacy rate with high expenditure are Uttar Pradesh and Bihar. The States with high income and high impact on literacy are seen in Gujarat and Punjab. The State with low expenditure and low impact is seen in Rajasthan.

Table. 5.19. Impact analysis for Literacy Rate

Literacy Rate	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Medium Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Gujarat, Kerala	Punjab	Punjab, Gujarat, Tamil Nadu, Maharastra	Kerala	
Medium Impact	West Bengal	Karnataka	Orissa, Assam, Haryana	Haryana	West Bengal, Karnataka	Assam, Orissa
Low Impact	Uttar Pradesh, Bihar	Andhra Pradesh, Madhya Pradesh,	Rajasthan		Andhra Pradesh, Rajasthan	Madhya Pradesh, Uttar Pradesh, Bihar

5.6.2 Impact analysis on Gross Enrolment Ratio (GER)

From the Table 5.20, Madhya Pradesh, Orissa, Assam as higher impact on gross enrolment ratio though they are having low per capita income and low expenditure where as Gujarat, Karnataka also showed higher impact. Uttar Pradesh and Bihar with higher

expenditure and low per capita income showed lower impact on gross enrolment ratio. All other States showed medium impact on the gross enrolment ratio.

Table 5.20 Impact analysis on Gross Enrolment Ratio (GER)						
GER	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Middle Income**	**Low Income**
High Impact		Karnataka Gujarat, Madhya Pradesh	Assam, Orissa	Gujarat,	Karnataka	Madhya Pradesh Assam, Orissa
Medium Impact	Tamil Nadu, Maharashtra, West Bengal	Andhra Pradesh	Rajasthan	Tamil Nadu, Maharashtra	West Bengal Andhra Pradesh, Rajasthan	
Low Impact	Uttar Pradesh, Bihar	Kerala	Haryana, Punjab	Haryana Punjab	Kerala	Uttar Pradesh, Bihar

5.6.3 Impact analysis on Drop Out Rates (DOR)

Table 5.21 Impact analysis on Drop Out Rates (DOR)						
DOR	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Medium Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Kerala, Madhya Pradesh	Haryana	Haryana Tamil Nadu, Maharastra	Kerala	Madhya Pradesh
Medium Impact	Uttar Pradesh	Karnataka, Gujarat	Orissa, Punjab	Punjab, Gujarat,	Karnataka	Uttar Pradesh, Orissa
Low Impact	Bihar, West Bengal	Andhra Pradesh	Rajasthan Assam		West Bengal, Andhra Pradesh, Rajasthan	Bihar Assam

The States with high expenditure and high per capita income and their impact is high on dropout rates are seen in Tamil Nadu and Maharastra (Table 5.21). The medium

expenditure on education and lower per capita income but the impact is higher in the State Madhya Pradesh. Though high expenditure is seen in the States Bihar, West Bengal, and Andhra Pradesh showed lower impact. The more impact of the public education expenditure on the dropout rates are seen in the States Madhya Pradesh, Kerala, Tamil Nadu, Maharastra, Gujarat, Uttar Pradesh, Orissa, Punjab, and Haryana where as lower impact is seen in the States Bihar, West Bengal, Andhra Pradesh, Rajasthan and Assam.

5.6.4 Impact analysis on Life Expectancy at Birth for Males (LEBM)

The States with high impact on life expectancy at birth for males are seen in Tamil Nadu, Maharashtra with high expenditure. The high expenditure with low impact is seen in Uttar Pradesh where as low per capita income with low impact is seen in Madhya Pradesh, Uttar Pradesh, Assam and Orissa (Table 5.22).

Table 5.22 Impact analysis on Life Expectancy at Birth for Males (LEBM)

LEBM	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Medium Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Kerala	Haryana Punjab,	Punjab, Maharastra, Haryana, Tamil Nadu	Kerala	
Medium Impact	West Bengal, Andhra Pradesh	Karnataka, Gujarat	Bihar		Karnataka, West Bengal, Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh, Rajasthan	Assam, Orissa	Gujarat,	Rajasthan	Madhya Pradesh, Uttar Prades Orissa, Assam

5.6.5 Impact analysis on Life Expectancy at Birth for Females (LEBF)

Table 5.23 Impact analysis on Life Expectancy at Birth for Females (LEBF)						
LEBF	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Middle Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Kerala	Haryana Punjab,	Punjab, Maharastra Haryana Tamil Nadu	Kerala	
Medium Impact	West Bengal Andhra Pradesh	Karnataka Gujarat	Bihar	Gujarat,	Karnataka West Bengal Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Assam Orissa		Rajasthan	Madhya Pradesh Uttar Pradesh Orissa Assam

In the Table 5.23 the impact analysis showed that States with high impact on life expectancy at birth for females are seen in Tamil Nadu, Maharashtra with high expenditure. The high expenditure with low impact is seen in Uttar Pradesh where as low per capita income with low impact is seen in Madhya Pradesh, Uttar Pradesh, Assam and Orissa. The low expenditure and high per capita income with high impact is seen in the States Haryana and Punjab. The medium expenditure and middle per capita income with medium impact is seen in the States Andhra Pradesh and Karnataka where as Kerala showed higher impact.

5.6.6 Impact analysis on Infant Mortality Rates (IMRs)

The higher expenditure with higher impact is seen in the States Tamil Nadu, West Bengal and Maharashtra, where as higher expenditure and medium impact in Bihar and higher

expenditure with lower impact in Uttar Pradesh. The States Uttar Pradesh, Madhya Pradesh, Gujarat, Rajasthan and Orissa showed lower impact on infant mortality rates. The States with low impact are seen in the States Rajasthan, Orissa, Assam, Madhya Pradesh (Table 5.24).

Table 5.24 Impact analysis on Infant Mortality Rates (IMRs)

IMRs	High Exp.	Medium Exp.	Low Exp.	High Income	Middle Income	Low Income
High Impact	Tamil Nadu, Maharashtra West Bengal	Kerala	Punjab	Punjab, Maharastra, Tamil Nadu	Kerala, West Bengal	
Medium Impact	Andhra Pradesh	Karnataka	Haryana Assam, Bihar	Haryana	Karnataka Andhra Pradesh,	Bihar Assam
Low Impact	Uttar Pradesh	Madhya Pradesh Gujarat Rajasthan	Orissa	Gujarat,	Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa

5.6.7 Impact analysis on Child Mortality Rate (CMR)

Table 5.25 Impact analysis on Child Mortality Rate (CMR)

CMR	High Exp.	Medium Exp.	Low Exp.	High Income	Middle Income	Low Income
High Impact	Tamil Nadu, Maharashtra, West Bengal	Kerala	Punjab	Punjab, Maharashtra, Tamil Nadu	Kerala, West Bengal	
Medium Impact	Andhra Pradesh	Karnataka Gujarat	Haryana Bihar	Haryana, Gujarat	Karnataka Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Orissa, Assam		Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa, Assam

From the Table 5.25, we conclude that no States are showeing high impact on child mortality rate with low expenditure and low per capita income except Punjab with low expenditure. Uttar Pradesh is the State showed low impact with high expenditure on health.

5.6.8 Impact analysis on Crude Death Rate (CDR)

Table 5.26 Impact analysis on Crude Death Rate (CDR)

CDR	High Exp	Medium Exp	Low Exp	High Income	Middle Income	Low Income
High Impact	West Bengal	Kerala, Karnataka	Punjab, Haryana	Punjab, Haryana,	Kerala, West Bengal, Karnataka	
Medium Impact	Tamil Nadu, Maharashtra Andhra Pradesh	Gujarat	Assam	Maharashtra, Gujarat, Tamil Nadu	Andhra Pradesh,	Assam
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Orissa, Bihar		Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa, Bihar

The only State with high expenditure and medium per capita income showed high impact on crude death rate is West Bengal. The higher expenditure and lower per capita income with lower impact is seen in the States Uttar Pradesh and Bihar (Table 5.26).

5.7 Summing Up and Conclusion

In this chapter, our data were tested to determine the form of regression that would be applied. The F-test is selected to test the LR, GER, DOR, LEBM, LEBF, IMR, CMR, and

CDR. The Least square dummy variable (LSDV) model was applied to estimate the panel model for the impact of public expenditure on education and health on their outcome indicators.

Estimated results for the literacy rate regression reveal that public expenditure on education has long run positive sustainable impact on literacy rate. In case of gross enrolment ratio and dropout rates there is no significant impact by public education expenditure where as per capita have significant impact on both these indicators.

The effects of public health expenditure on LEBM and LEBF on average of over 15 States, the elasticity are positive with 0.028 and 0.026 which means a 1 % increase in public expenditure will lead to 2.8 years increase in LEBM and 2.6 years in LEBF. The impact of public health expenditure on IMR is negative, the elasticity is -0.045 which means a 1 % increase in public health expenditure will decrease 4.5% of infant deaths. The effectiveness of public health expenditure on CMR is negative and the elasticity is (-0.135). It means 1 % increase in public health expenditure will reduce 13.5 % in child deaths on an average of 15 states. In case of CDR the elasticity is -0.093 which means 1 % increase in public health expenditure will reduce 9.3 %.

Conclusion on Public Expenditure in Education and Health

Previous sections in this chapter have shown that levels of impact on education vary greatly between States, but these variations are not the principal determinant of States' proximity to the target of full literacy rate, primary gross enrolment ratios and reduce

dropout rates. . State-wise comparisons reveal widespread inefficiency in translating expenditure into educational outputs.

Public expenditure on education *per se* will not necessarily produce progress towards the MDG education target of literacy rate, primary gross enrolment and dropout rates for all children. Other factors – poverty, adult literacy, health on the demand side, and efficient, effective resource management and quality on the supply side – exert a more powerful influence. Increasing expenditure without tackling these may be as effective as pushing on a piece of string; higher outlays may be absorbed by higher unit input costs and falling levels of efficiency. Without reforms education expansion programmes may increase enrolments temporarily but this progress may be unsustainable, and may not print through into lower dropout rates.

Only with careful diagnosis of local factors inhibiting progress, and with careful planning, targeting and monitoring of public interventions, will consistent and purposeful progress towards the target be made. The inhibiting factors may be technical, administrative, socio-economic and political, and they occur on the demand side as well as on the supply side. Even with these precautions the impact of higher expenditure on outcomes may be slow to materialize.

Except in high income States, the MDG target seems at first sight tantalizingly within reach with the application of affordable, feasible, additional funding. Seen at closer quarters, however, the problems appear less tractable and more deeply ingrained,

particularly on the demand side, where poverty and the low educational status of parents heavily depress school attendance.

Reforms to raise enrolment bring their own problems, notably an enrolment 'bulge'. On the side of the supply of education the problems and their remedies are well known in theory, but are often not acted upon in the absence of political stimulus from on top – or from outside.

The countries most at risk of failing to meet the MDG target of primary school enrolment, dropout rates for all children by 2015 are those whose performance is weighed down by, and whose progress is most likely to be retarded by, adverse demand side factors, notably household poverty and the perceived absence of opportunity from education. When demand side restraints are relaxed, e.g. by lowering user costs, primary schools in 'at risk' countries are likely to face an acute enrolment 'bulge' of over-age children. This compounds the underlying problems of making public expenditure on education efficient and effective, overcoming geographical and social inequities, and improving school quality.

The challenges of UPE, like the target itself, are not new, and they have not been aggravated by adverse shocks, except in countries seriously affected by HIV. In many countries like India they are being alleviated by demographic transition and stabilizing or falling cohorts. Nevertheless, the pace of advance, over the last three decades, towards the MDG has been modest, and expert opinion doubts if it can be accelerated sufficiently

to meet the target. There is institutional, and even political, resistance to the requisite reforms in resource allocation and technical efficiency. The nascent practice of performance budgeting and management needs stronger political support.

Though there has been remarkable progress in health outcome indicators in the States – from 1980 to 2006. Earlier success was due in good part to immunization, but vaccination coverage has recently begun to decline, and many poor children are unserved.

The extension of facilities for primary health care over the last three decades may have improved access to facilities for poor people but, its contribution to the health outcome indicators improvement has been disappointing, particularly in low income States. Over the last decade a refocusing of public expenditure on the priority provision of public goods and a 'minimum package' of high impact interventions has been repeatedly canvassed by multilateral organizations, but has not been implemented with courage and vigour, even in countries which have received sustained donor support for their health sector operations.

Thus far, in the thesis, we completed the investigation on the relations between public expenditure and social sectors that is education and health, and we have achieved the objective of testing the possible relation between these two factors of the economy. In the next chapter, we conclude the thesis by discussing the significances and implications of the finding and limitations of the methodology employed in this study, as well as suggesting some directions for future research on the subject covered in this thesis.

CHAPTER 6

SUMMARY AND CONCLUSION

6.1 Introduction

This study examined the aspect of public expenditure that has received limited attention so far in literature. The primary question on which we sought an answer in this study was: Does increased public expenditure increased social sector outcomes, *i.e.* does expenditure facilitate education and health? In order to answer this question, we investigated whether education and health expenditure has impact on their outcomes. The investigation in this study was conducted at both theoretical and empirical levels. At the theoretical level, we used the theory of information economics and argued that social capital brought in by expenditures can increase the outcomes that are education and health. At the empirical level, first, we developed a model which included public expenditure variable. The model was estimated using data for a panel of 15 States over 25 years, to investigate the long-run relation of public expenditure on social services. Second, we investigated the possible relation between public expenditure and social service sectors.

In the remainder of this chapter, first an over view of the study is provided. A summary of key findings of the study is presented later. Then, the policy implications of the findings are discussed. Next, the chapter discusses the limitations of this study. Finally, some suggestions for further research are provided.

6.2 Overview of the Study

The literature review on the economic theories of human development outcomes and public expenditure presented in chapter 2 demonstrated that a growing number of studies disagree with notion of public expenditure- human development substitution.

In chapter 3, we study the trends in public education and health expenditure and also the trends in outcome indicators for both education and health.

In chapter 4 we investigated the economic techniques suitable to State-specific model, which utilizes the pooled cross-section and time series data. The selection of the fixed effect is determined on both theoretical and practical grounds. Variables in the model and their hypothetical impacts on Indian State's education and health outcomes were discussed. Chapter 4 also reported the data sources and data collection techniques discussed the necessary data manipulation procedures and preliminary analysis data.

Chapter 5 performed a range of tests to reach at a regression model, which is suitable to the panel estimated results which established the long-run equilibrium relations between education, health and public expenditure.

6.3 Achievements of the Study

It is now well recognized that economic growth does not, by itself, guarantee human development. While some countries have achieved progress in social development in spite of low economic growth, others have seen increases in per capita income

without any corresponding dent in the poverty or ill health of their children. It is equally true that social development alone (specifically education and health development) may not be enough to reduce income poverty or promote economic growth. However, it is evident, that progress in one area supports progress in the others. Governments must tap into such synergies if economic growth is to go hand-in-hand with human development.

Public expenditure on health in India is grossly inadequate. India spends less than 1% of its GDP on health. Only Pakistan spends less among its South Asian neighbors. Sri Lanka and Bhutan which are poorer than India spend 6 % and 10 % respectively of their GDP on health. How much of its national resources a country decides to devote to its people's health is a normative issue and largely determined by the orientation of prevailing politics. The National Health Policy on Health 2002 proposes to raise public expenditure on health as a percentage of GDP from the present 0.9 % to 2.0 % by 2010. This is still very low given the current burden of disease in India, as well as the burden of illness and disease that can be expected in the future, even with the current conservative estimates of HIV/AIDS infected people in India.

The Central and State sectors are responsible for the provision of primary health care in the country. A spending of less than 1 % of the GDP on public health is not only dismally low but most of the expenditure is on staff salaries leaving little or nothing for facilities, drugs and consumables. The large existing can and should be used more

effectively with the help of private partnerships to enable better delivery. Building better forward and backward linkages through a superior referral system would cause the secondary and tertiary care facilities to be more manageable and prevent than from being over burdened.

As a result, public expenditure witnessed a decline during the first half of the Nineties mainly on account of the central government's expenditure whereas the expenditure of State governments has remained mostly stable in terms GDP. The share of developmental expenditure has declined over the years which need to be reversed to improve future economic growth potential. The development expenditure, particularly in social sector has important implication for human development in India.

The study examined the impact of social sector public expenditure on education and health development across the States using the fixed effects model (LSDV) for the early 2006. The analysis link between per capita expenditure on education and health and their outcomes revealed that there is a positive functional relationship between them. The per capita income, though found significant in determining the social sectors outcomes indicators of both education and health, is not a sole factor, which leads to human development. Also, the estimates coefficients of LSDV revealed that public expenditure on health has relatively stronger impact on human than growth in per capita income per se. The same results were not obtained in case of education outcomes. The results were in confirmations with trend that public expenditure on human capital formation gets transformed to the end results of better human

development indicators. In other words, the public policy stance plays a crucial role in human development.

Income does not seem to be possible explanatory variable in the regressions designed to estimate dispersion. It is important to note that contrary, to the belief that all the BIMARU States perform poorly, Bihar was not a badly performing State in the efficiency analysis. On the other hand, States like Tamil Nadu and Karnataka which are believed to have improved their health indicators, showed poor efficiency in performance.

It was found that not all States with better health indicators have efficient health systems. Relative efficiencies differ across States, due to differences not only in health sector endowment, but also in its efficient use. This demonstrates the States should not only increase their investment in the health sector, but should also manage it more efficiently in order to achieve better health outcomes. In an era of liberalization of the health sector and diminishing role of government in health provision, the emphasis should definitely be on improving performance.

The results can be summarized that public health expenditure unambiguously and positively affects health status, *i.e.* higher public health expenditure improves health status. Also, the results seem to indicate that IMR, CDR, CMR declines in response to improved health status, where as for LEB for males and females raised. Finally, the

results indicate that higher growth leads to better health, improves growth on other hand.

What do these results imply? Over the years it has been observed in India that though both Life Expectancy at Birth increased and IMR, CDR, CMR has decline to some extent, the health status of the population remained low. These results seem to indicate that further reduction in IMR, CMR CDR and improvement in Life Expectancy at Birth are probably not possible without significant improvements in the health condition of the population. Secondly, health conditions can be improved by investment in health. Health sector investment needs to be made on large scale, as a rise in health expenditure per capita yields both higher growth and better quality of life. At present India is among the group of countries that invest little in health. India spends 0.9% of its GDP on health, which translates into about Rs.165 per capita (World Bank, 2001). Most of these expenditures emanate from the States, and not the Centre. The low or moderate value of the elasticity estimates probably arises from the act that most other States have a low level of per capita health expenditure. Among some of the other determinants, per capita income seems to improve both health outcome and growth, as is evident from the estimates. These results are not surprising; the role of education, industrialization and urbanization also play an important role.

What are the policy implications from these results? The main implication seems to be that improved education and health outcomes are necessary for improved rates of

growth of income, especially over time. At the same time, higher growth enables the system to generate better education and health will also lead to lower IMR, CMR CDR, DOR and increased literacy rate, GER, Life Expectancy at Birth. Accompanied by improved investment through government expenditure in education and an increase investment in health might be a necessary condition for putting States on a path of accelerated growth, better levels of living and health status. If India continues increasing its budgetary spending in health, education, and rural infrastructure, as it has done in the 2005-06 budgets, it would be possible to save the lives of vast numbers of mothers who will die in childbirth and infants who will die before their first birthday.

Perhaps most importantly, India should "plan for success." The Planning Commission should ensure that current programs as well as the next Five-Year Plan are built around achieving the Millennium Development Goals. Indeed, not only the Union Government, but every State and even every District, should base their investment programs around achieving the Millennium Development Goals. Governments at all levels should be held accountable for achieving these goals. If these steps are taken, India can finally eradicate extreme poverty. Unless government expenditures on social services are equitably shared, the gaps between access to basic social services and social indicators will remain. The regional averages for unmet needs hide huge disparities between and within countries. These disparities affect ethnic groups, regions, and different households. Even the location of households is important, with rural areas often lacking the basic social services enjoyed by urban populations.

6.4 Policy Implications

To analyse the role of public expenditure policy and management as key instruments in the pursuit of the fiscal policy goals in India. The role of public expenditure in the fiscal policy goals of growth, equity and stability, has varied across different phases of economic development in India. The historical importance of public expenditure lies in the mixed economy model adopted after Independence in India whereby the government assumed the primary responsibility of building the capital and infrastructure base to promote economic growth. The concerns regarding equity and poverty alleviation after two decades of Independence added another important dimension to public expenditure in terms of redistribution of resources.

The goals of fiscal policy in India over the years have been promotion of growth, equity and stability although the relative emphasis on each of them has varied across the different phases. Typically, the growth objective was assigned the prime importance during the first four decades of the planning era. As the government's attention shifted more towards poverty alleviation and employment generation, equity became the overriding objective thereafter. With the fiscal imbalances turning unsustainable since the early Nineties, the objective of restoring stability was accorded priority and the fiscal consolidation programme was undertaken to correct the fiscal imbalances. A common feature across all these phases was the adoption of public expenditure management as the key operating fiscal policy instrument to pursue the objectives. Accordingly, public expenditure on capital formation undertook the responsibility of commanding heights to foster economic growth

during the take-off phase in early part of the planning era. The shift in orientation of fiscal policy towards taking direct measures for addressing social and equity objectives reflected the concerns about the effectiveness of the "trickle-down" theory of growth strategy. Accordingly, public expenditure policy had to be reoriented towards undertaking of social expenditure in terms of direct measures on poverty alleviation and employment generation. In respect of capital outlays, the focus was shifted towards improving efficiency of their utilisation for capital formation and growth. Amidst the initiation of fiscal consolidation in the Nineties, however, expenditure compression measures had to bear the major burden of sharing the fiscal correction which led to a decline in capital outlays as a proportion of GDP.

6.4.1 Public expenditure and growth

Economic growth has been one of the abiding goals of fiscal policy in India and public expenditure management has been one of the key fiscal policy instruments to attain it. Empirical studies have, however, come out with debatable and competing results about the relationship between the two. Some studies have found a negative impact of government spending on output growth and, therefore, advocated small government sector for faster growth (Barro, 1991). On the other hand, there are studies, which distinguished government expenditure into government consumption and government capital accumulation and have found that government capital stock had a positive impact on productivity and growth (Ram, 1986 and Aschauer, 1989).

It may be noted that the Central government budget categorises expenditures in terms of revenue and capital and Plan and non-Plan groups. With a view to examining the welfare impact, the Centre's expenditures need to be classified in terms of developmental and non-developmental categories as done in the States' budgets. An analysis of the last two decades indicates that the share of developmental expenditure in total expenditure has generally declined in respect of Centre as well as the States. Furthermore, the States have shared a greater responsibility in undertaking developmental expenditure. Furthermore the responsiveness of income to developmental expenditure has increased during the post-reform period. This reflects that with the conducive environment provided by the economic reforms, the developmental expenditures have increasingly facilitated "crowding-in" of private investment thereby facilitating the growth process.

6.4.2 Public expenditure and equity

Another abiding objective of the public expenditure policy in India has been to promote equity through poverty alleviation, employment generation, improving health services, providing education and provision of food subsidies. The impact of measures undertaken in the above areas is visible in the achievements in respect of various social indicators such as poverty ratio, demographics, education and health.

6.4.3 Emerging fiscal policy scenario

The Union Budget 2005-06 has set a "pause" in the FRBM keeping in view the impact of implementing the recommendations of the Twelfth Finance Commission

(TWFC), which implies substantially higher devolution of resources from the Centre to the States and some provisions for enabling smoother implementation of Value Added Tax in the States. Nevertheless, the government has committed to "resume the process of fiscal correction with effect from 2006-07 and achieve the FRBM goals by 2008-09". The sectoral allocation of expenditure under certain developmental heads indicates the government thrust on rural development through agriculture and universalisation of education. The increase in share of health spending reflects higher allocation for financing, inter alia, the National Rural Health Mission (NRHM) which will be launched from 2005-06.

6.4.4 Role of expenditure policy and management in emerging fiscal scenario in social service sectors– An assessment

The fiscal policy strategy in the coming years would be to increase revenues by reaping the opportunity of a high growth phase and at the same time reorienting expenditure to pay for more outlays on education, health and infrastructure. The State governments in India have been assigned higher responsibilities by the Constitution (Seventh Schedule, Article 246) in respect of social spending such as health, education and family welfare. The major part of the policy is designed by the Planning Commission and States to undertake the responsibility of implementing these policies. The deterioration in the fiscal health of States has placed pressure on the development and social spending in recent years. It is necessary, therefore, to restore the health of State finances through control of non-developmental expenditure. In this context, the enactment of fiscal rules by five States so far assumes

importance in the process of fiscal consolidation at State level. While fiscal prudence at the State level is important, it should also be recognized that the States in future should have greater responsibilities of developmental and social spending.

6.5 Limitations of the Study

In our model, we are unable to add other important variables which determine the education and health outcome indicators. Our analysis excludes other States of India in the estimates of the model using panel data due to insufficient observations of some data series such as education and health outcome indicators. In the area of econometric techniques, due to the complexity of panel data analysis is itself a limiting factor. Finally the data is limited.

6.6 Areas for the Further Research

The study adds to the existing body of knowledge, from a long-run equilibrium perspective, by disagreeing with the belief that expenditure is an unambiguous substitute for education and health outcomes. Evidences from this study shows that within certain levels of public spending on education and health, indicators are enhanced by expenditure rather than replaced by expenditure. Following this finding, it is interesting for further investigation whether expenditure information benefits intra-state human development indicators. It is also interesting to pursue a similar study for the case of special –category States of India. It is interesting area for further exploration and if it can successfully introduce structural change into the panel model, the regression will have a better fit of the data and an improvement of the

estimation. Future studies on the econometric techniques that can be used to separate the simultaneous impact of public expenditure through lagged impact on outcomes indicators in the panel data model also be useful.

Last, but not the least, further research to improve the simulation results are also worth pursuing.

APPENDIX TO CHAPTER 5

In this section of appendix, the mean values for the per capita income (PCI) and total expenditure on education (TEXPE) and total expenditure on health (TEXPH) and Coefficients of the eight outcome indicators are presented

Appendix 5-A-1 Means values of Per Capita Income, Total expenditure on Education and Health

Table 5-A-1

PCI	Mean	Rank	TEXPE	Mean	Rank	TEXPH	Mean	Rank
Punjab	8263.411	1	**Uttar Pradesh**	191518.5	1	**Maharashtra**	52708.77	1
Maharastra	7807.896	2	**Tamil Nadu**	133008.6	2	**Uttar Pradesh**	51321.95	2
Haryana	7566.792	3	**West Bengal**	127887.2	3	**West Bengal**	40994.06	3
Gujarat	6889.06	4	**Maharashtra**	127287.4	4	**Tamil Nadu**	38053.56	4
TamilNadu	5745.927	5	**Bihar**	115648.5	5	**Andhra**	32153.78	5
Karnataka	5456.004	6	**Andhra**	103021.1	6	**Karnataka**	27323.64	6
Kerala	5128.288	7	**Gujarat**	99520.13	7	**Madhya**	27134.6	7
Andhra Pradesh	5106.722	8	**Kerala**	88405.11	8	**Gujarat**	26276.95	8
West Bengal	4979.196	9	**Madhya**	87024.79	9	**Rajasthan**	25495.58	9
Rajasthan	4272.304	10	**Karnataka**	83932.86	10	**Kerala**	21926.04	10
Madhya Pradesh	4135.65	11	**Rajasthan**	76127.05	11	**Bihar**	21898.13	11
Assam	3949.833	12	**Orissa**	50662.26	12	**Punjab**	17028.22	12
Uttar Pradesh	3466.664	13	**Assam**	46621.96	13	**Orissa**	14117.24	13
Orissa	3426.34	14	**Punjab**	14377.6	14	**Assam**	10983.99	14
Bihar	2396.488	15	**Haryana**	10455.66	15	**Haryana**	10246.68	15

Appendix 5.B Education Outcome Indicators

Table 5-B-1

States	LIT	Rank	States	GER	Rank	States	DOR	Rank
Kerala	2.70	1	**Assam**	3.17	1	**Kerala**	4.75	1
Maharashtra	2.35	2	**Madhya Pradesh**	3.11	2	**Tamil Nadu**	6.98	2
Tamil Nadu	2.34	3	**Gujarat**	3.10	3	**Haryana**	7.08	3
Gujarat	2.29	4	**Karnataka**	3.08	4	**Maharashtra**	7.33	4
Punjab	2.28	5	**Orissa**	3.07	5	**Madhya Pradesh**	7.43	5
Haryana	2.27	6	**Rajasthan**	3.05	6	**Uttar Pradesh**	7.52	6
West Bengal	2.26	7	**Maharashtra**	3.05	7	**Karnataka**	7.55	7
Karnataka	2.23	8	**Tamil Nadu**	3.00	8	**Punjab**	7.64	8
Orissa	2.23	9	**West Bengal**	3.00	9	**Orissa**	7.78	9
Assam	2.19	10	**Andhra Pradesh**	2.94	10	**Gujarat**	7.82	10
Madhya Pradesh	2.13	11	**Bihar**	2.94	11	**Assam**	7.91	11
Andhra Pradesh	2.04	12	**Kerala**	2.83	12	**Bihar**	7.94	12
Uttar Pradesh	2.00	13	**Haryana**	2.69	13	**Andhra Pradesh**	8.02	13
Rajasthan	1.98	14	**Punjab**	2.68	14	**West Bengal**	8.07	14
Bihar	1.97	15	**Uttar Pradesh**	2.68	15	**Rajasthan**	8.20	15

Appendix 5-C Health Outcome Indicators

Table 5-C-1

States	LEBM	Rank	States	LEBM		States	IMR	Rank
Kerala	3.83	1	**Kerala**	3.86	1	**Kerala**	5.33	1
Punjab	3.78	2	**Punjab**	3.77	2	**Punjab**	6.57	2
Haryana	3.75	3	**Haryana**	3.73	3	**Maharashtra**	6.58	3
Tamil Nadu	3.71	4	**Maharashtra**	3.71	4	**Tamil Nadu**	6.58	4
Maharashtra	3.71	5	**Tamil Nadu**	3.71	5	**West Bengal**	6.59	5
West Bengal	3.70	6	**Karnataka**	3.71	6	**Karnataka**	6.59	6
Bihar	3.69	7	**West Bengal**	3.69	7	**Bihar**	6.61	7
Karnataka	3.69	8	**Andhra Pradesh**	3.68	8	**Andhra Pradesh**	6.67	8
Gujarat	3.68	9	**Gujarat**	3.67	9	**Assam**	6.74	9
Andhra Pradesh	3.68	10	**Bihar**	3.65	10	**Haryana**	6.78	10
Rajasthan	3.66	11	**Rajasthan**	3.64	11	**Gujarat**	6.80	11
Orissa	3.65	12	**Assam**	3.62	12	**Rajasthan**	6.86	12
Assam	3.64	13	**Orissa**	3.62	13	**Orissa**	6.99	13
Uttar Pradesh	3.63	14	**Uttar Pradesh**	3.59	14	**Uttar Pradesh**	7.00	14
Madhya Pradesh	3.60	15	**Madhya Pradesh**	3.56	15	**Madhya Pradesh**	7.03	15

Table 5-C-2

States	CMR	Rank	States	CDR	Rank
Kerala	4.17	1	**Kerala**	3.29	1
Tamil Nadu	5.59	2	**Punjab**	3.53	2
Maharashtra	5.65	3	**Haryana**	3.54	3
Punjab	5.67	4	**Karnataka**	3.59	4
West Bengal	5.77	5	**West Bengal**	3.63	5
Karnataka	5.80	6	**Maharashtra**	3.64	6
Andhra Pradesh	5.80	7	**Gujarat**	3.69	7
Haryana	5.87	8	**Tamil Nadu**	3.70	8
Bihar	5.91	9	**Andhra Pradesh**	3.71	9
Gujarat	5.98	10	**Assam**	3.73	10
Assam	6.00	11	**Rajasthan**	3.79	11
Orissa	6.15	12	**Bihar**	3.81	12
Rajasthan	6.21	13	**Orissa**	3.86	13
Uttar Pradesh	6.37	14	**Madhya Pradesh**	3.98	14
Madhya Pradesh	6.39	15	**Uttar Pradesh**	4.02	15

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Synopsis

THE EFFECTIVENESS OF PUBLIC EXPENDITURE ON SOCIAL SERVICES: AN EMPIRICAL STUDY OF INDIAN STATES

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Introduction

It is now well-known that basic social services are the building blocks for human development and are treated as fundamental human rights. In the early 1990s, world summits and global conferences set specific social development targets in the hope that these would lead to a new commitment to human development in economic and social policies. According to a report, nearly a hundred crore people in the world are illiterate and around 13 crore children of school age (about 60 per cent of them girls) are not in school. One-third of all children in developing countries fail to complete four years of primary education. One third of all children in developing countries are undernourished, rising to half of all the children in South Asia (8 crore) across the region. Around 170 crore people lack safe water, and over half the world's people (330 crore), are without access to adequate sanitation. The goals set at the World Summit for Children in 1990 promised universal access to primary education by the year 2000.

In India the Constitution provides for supply of basic social services by the governments at the central, state and local levels. Accordingly, substantial allocations are made in the budgets for education, health and other social services. Approximately, 20 percent of the total expenditure of the centre is allocated for the social sector services. At the State level the supply of basic social services is a key

component of the budgets and as much as 30 percent of the government expenditure is earmarked although the proportion varies across the states. However, to what extent the expenditure results in the social development is not known. Wrong prioritization and lack of accountability can reduce the effectiveness of these budgetary allocations. The aim of the study is to analyse the impact of public policy in terms of the public expenditure incurred on social services such as health and education on human development. The questions addressed are: firstly, to what extent the population size acts as the main determining factor in guiding the expenditure allocation to provision of social services, and secondly, to what extent the money spent by government is transformed to the end results of better human development indicators.

Objectives of the Study

The objective of this study is to examine the effectiveness of public expenditure of State Governments in India on social services. The present study aimed at finding out the effectiveness of public expenditure on social sectors abroad and primary education and health particularly. To this end, the specific objectives are:

1. Explore in depth the relationship across States between public expenditure and education, health outcomes in terms of both access and performance.
2. Identify the existing constraints to effective spending and suggest remedial measures.
3. Provide policy makers with a framework to analyze public expenditure and how it relates to education and health outcomes.
4. Understand from financing perspective, how Millennium Development goals has been achieved in India.

Nature and the Sources of Data

The data collected for the study is secondary data. The main source of comparable time-series data on public expenditure in the states of India is Finance Accounts GOI. The reported data cover State government's expenditure on various components of social services, including education and health. The expenditure data is mainly based on the Finance Accounts of the States from 1980-2006. It uses data from budget

documents of States for detailed analysis of expenditure under different heads for the years 2007-08 and 2008-09. It also uses information from the Annual Financial Statement and Budget At a Glance published by the Finance Department, Government of the States as well as data released by the Twelfth Finance Commission. .The per capita income data (1980 to 2004) is collected from the source Directorate of Economics & Statistics of respective State Governments, and for All-India -- CSO. Literacy Rate the data was collected from Census-1981, 1991, 2001 and from 1991 to 2000is collected from the National Sample Survey Organization (NSSO) GOI. For gross enrolment ratios and drop-out rates are collected from the main source ***"Abstract of Selected Educational Statistics, Ministry of Human Resource Development, and Government of India",*** various issues and the website **www.indiastat.com**. In case of health outcome indicator the main source is the Registrar General's Office's Sample Registration Scheme and the other are Economic Surveys.

Organisation of the Study

The research work carried out in this study or the analysis of the effectiveness o public expenditure is brought out in six chapters. The organization of the chapters is as follows.

CHAPTER 1

Chapter 1 present's brief introduction, objectives, the problem, importance, scope, significance, outline of the thesis are discussed.

CHAPTER 2

Chapter 2 reviews the literature on the theories and empirical studies relating to social services and welfare effects of public expenditure, in an attempt to find support for our arguments. Review of literature show that education and health plays a vital role in the overall development in a country. Investment in education and health becomes a necessary condition for economic and social transformation. Also, we intended to

search for evidences to support the notion advocated in Chapter 2 that public expenditure on social services is necessary.

CHAPTER 3

Chapter 3 analyses the growth performance of public expenditure, GDP, per capita income on social services are discussed. The trends analysis of education and health indicators are also discussed.

Major Findings of the CHAPTER 3

• Per capita spending on human development in the states is substantially higher than the Centre in India. It is, however, low in relation to a number of northeastern States.

• Although the per capita expenditure on human development has also been increasing in absolute terms, it has not kept pace with the growth of GSDP in the States. As a result, despite a rise in per capita expenditure on human development, the human expenditure ratio has fallen over the 1990s.

• The slow growth of in expenditure on human development relative to GSDP is closely related to the fiscal deterioration in the States in particular because of rise in debt stock and rising expenditure on salaries, wages and pensions from 1998- 99 onwards.

• The major constraint on public spending on human development is the dependence of the State on Centre for its revenues. Fluctuations in Central transfers are an important determinant of the fiscal situation in the State which in turn affects the capability of the State to invest in human development.

• Within the social sector, education accounts for a large share of expenditure. Despite deterioration in fiscal conditions, the States has managed to keep spending on education at more than 7 per cent of GSDP. In contrast, spending on other human development areas, including health, as a share of GSDP has tended to decline.

•Though the gross enrolment ratio has been increased in the States, it is estimated that 59 million children in age group of 6-14 are out of school.

• Among the States, the highest enrolment increase of 35.6 % was in Assam followed by Haryana (15.9%) and Maharashtra (14.6%) in 1996-97. The national average was

9.4 per cent. In 1997-98, the highest increase in enrolment was in Madhya Pradesh (10.5%).

• Infant and child morbidity and crude death rates are intolerably high in India. Not only social justice but economic efficiency is being compromised as India does little to protect the health and well-being of its future generations.

CHAPTER 4

Chapter 4 develops and justifies a model to analyze social services with public expenditure and discuss the econometric issues confronted by this study in order to determines the appropriate econometric techniques that should be applied to the panel data model, proposed tests, explain the appropriate data set in order to prepare for the analysis of the data and data sources. In summary, after doing proposed tests for our study, to utilise the benefits provided by the increasing variation from the panel data while more realistically recognising the difference between cross-sections, we could use the fixed effect model (FEM) would be the appropriate model to carryout the econometric analysis in this study.

Methodology of the Study

Following the recent proliferation of cross-country studies of the impact of public expenditure on growth, attention has turned to how public expenditure can most effectively be allocated so as to improve human development indicators. One answer is premised on the view that public expenditure be targeted to the poor. Consequently public expenditure should be increased in the countries with poor human development there by achieving growth, in turn reduces poverty. Irrespective of whether growth is welfare enhancing and of whether public expenditure contributes to such growth, there are many ways in which public expenditure can contribute to welfare. Some expenditures such has that on education and health are more likely to enhance welfare than other types and thus likely to benefit the poor. To capture this, the approach adopted here is to assess the impact of State-level public expenditure of India on human development indicators particularly in education and health. We took public expenditure on education and health in a sample of 15 States (Andhra Pradesh,

Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal) of India over 1980-2006. We used eight outcome indicators of welfare. Using Least Square Dummy Variable model (fixed Effects model) regressions, we evidence that public expenditure is associated with higher development and that public expenditure tends to have a greater effect on outcome indicators in those countries like India with lower welfare. In this study explanatory variables are public expenditure on education (consists of Education, Sports Art and Culture) and health (consists of Medical and Public) Health and per capita income are taken. The dependent variable for education are literacy rate, gross enrolment ratio and drop-out rates where as for health includes life expectancy at birth for males, life expectancy at birth for females, infant mortality rate, child mortality rate and crude death rate.

The regression equations used for education outcomes are linear of the form:

Education Outcomes = f (Per capita income, adult literacy, per capita GDP, pre schooling expenditure / GNP, Unit cots variables)

where education outcome represents literacy rate, net or gross enrolment ratios, dropout rates, completion rates, repetition rates.

Health Outcomes = f {Public Expenditure, per capita GDP, income distribution, water& sanitation, rural / urban, female education, vaccination rates, socio-cultural variables}

where Health Outcomes are generally life expectancy at birth, infant mortality rate, child mortality, crude birth rate, crude death rate, fertility rates.

The model estimated by OLS technique in log-log linear model and transformed to the fixed-effect model (FEM) or the Least Squares Dummy Variables (LSDV) model The model thus is specified in the following form:

$$\ln(Y_{it}) = \alpha_i + \beta_1 \ln(EXP_{it}) + \beta_2 \ln(PCI_{it}) + u_{it}$$

Y_{it} = Dependent variables of the education or health indicators of the State i at time t

EXP_{it} = Total expenditure on education or health of the State i at time t

PCI_{it} = Per capita income of the State i at time t

Ln = Natural logarithm

u_{it} = The panel error term

α_i = State- Specific intercepts

Data Limitations

The reasons for selecting the above outcome and explanatory variables and also 15 major States are as follows.

1. We could not get data for other variables and for other States.
2. Availability of data sources is very difficult.
3. From the empirical side, we have done impact analysis with other variables such as per capita GDP, per capita expenditure, capital expenditure, infant mortality rate, fertility rate, as they showed insignificant results.
4. Based on theoretical and empirical evidences many of the studies concentrated on government spending and per capita income particularly in the countries with poor welfare.
5. We have done with regressions with OLS and Random models but found insignificant results.

CHAPTER 5

Chapter 5 investigates whether possible relations between public expenditure and social services can be established.

Major Findings of the CHAPTER 5

In this chapter, our data were tested to determine the form of regression that would be applied. The F-test is selected to test the LR, GER, DOR, LEBM, LEBF, IMR, CMR, and CDR. The Least square dummy variable (LSDV) model was applied to estimate the panel model for the impact of public expenditure on education and health on their outcome indicators.

Estimated results for the literacy rate regression reveal that public expenditure on education has long run positive sustainable impact on literacy rate. For the long run effect of public expenditure on literacy rate on average of over the 15 states, the elasticity is positive 0.054, which means a 1 percent increase in public education expenditure will lead to 5.4 percent increase in literacy rate.
In case of gross enrolment ratio and dropout rates there is no significant impact by public education expenditure where as per capita have significant impact on both these indicators.

The effects of public health expenditure on LEBM and LEBF on average of over the 15 states, the elasticity are positive with 0.028 and 0.026 which means a 1 percent increase in public expenditure will lead to 2.8 years increase in LEBM and 2.6 years in LEBF.

The impact of public health expenditure on IMR is negative, the elasticity is -0.045 which means a 1 percent increase in public health expenditure will decrease 4.5 percent of infant deaths.

The effectiveness of public health expenditure on CMR is negative and the elasticity is (-0.135). It means 1 percent increase in public health expenditure will reduce 13.5 percent in child deaths on an average of 15 States.

In case of CDR the elasticity is -0.093 which means 1 percent increase in public health expenditure will reduce 9.3 percent.

We have showed a clear State-wise impact analysis on each out indicators in the following Tables.

Table. 5.19. Impact analysis for Literacy Rate

Literacy Rate	High Exp.	Medium Exp.	Low Exp.	High Income	Medium Income	Low Income
High Impact	Tamil Nadu, Maharashtra	Gujarat, Kerala	Punjab	Punjab, Gujarat, Tamil Nadu, Maharastra	Kerala	
Medium Impact	West Bengal	Karnataka	Orissa, Assam, Haryana	Haryana	West Bengal, Karnataka	Assam, Orissa
Low Impact	Uttar Pradesh, Bihar	Andhra Pradesh, Madhya Pradesh,	Rajasthan		Andhra Pradesh, Rajasthan	Madhya Pradesh, Uttar Pradesh, Bihar

Table 5.20 Impact analysis on Gross Enrolment Ratio (GER)

GER	High Exp.	Medium Exp.	Low Exp.	High Income	Middle Income	Low Income
High Impact		Karnataka Gujarat, Madhya Pradesh	Assam, Orissa	Gujarat,	Karnataka	Madhya Pradesh Assam, Orissa
Medium Impact	Tamil Nadu, Maharashtra, West Bengal	Andhra Pradesh	Rajasthan	Tamil Nadu, Maharashtra	West Bengal Andhra Pradesh, Rajasthan	
Low Impact	Uttar Pradesh, Bihar	Kerala	Haryana, Punjab	Haryana Punjab	Kerala	Uttar Pradesh, Bihar

Table 5.21 Impact analysis on Drop Out Rates (DOR)

DOR	High Exp.	Medium Exp.	Low Exp.	High Income	Medium Income	Low Income
High Impact	Tamil Nadu, Maharashtra	Kerala, Madhya Pradesh	Haryana	Haryana Tamil Nadu, Maharastra	Kerala	Madhya Pradesh
Medium Impact	Uttar Pradesh	Karnataka, Gujarat	Orissa, Punjab	Punjab, Gujarat,	Karnataka	Uttar Pradesh, Orissa
Low Impact	Bihar, West Bengal	Andhra Pradesh	Rajasthan Assam		West Bengal, Andhra Pradesh, Rajasthan	Bihar Assam

Table 5.22 Impact analysis on Life Expectancy at Birth for Males (LEBM)						
LEBM	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Medium Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Kerala	Haryana Punjab,	Punjab, Maharastra, Haryana, Tamil Nadu	Kerala	
Medium Impact	West Bengal, Andhra Pradesh	Karnataka, Gujarat	Bihar		Karnataka, West Bengal, Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh, Rajasthan	Assam, Orissa	Gujarat,	Rajasthan	Madhya Pradesh, Uttar Prades Orissa, Assam

Table 5.23 Impact analysis on Life Expectancy at Birth for Females (LEBF)						
LEBF	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Middle Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra	Kerala	Haryana Punjab,	Punjab, Maharastra Haryana Tamil Nadu	Kerala	
Medium Impact	West Bengal Andhra Pradesh	Karnataka Gujarat	Bihar	Gujarat,	Karnataka West Bengal Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Assam Orissa		Rajasthan	Madhya Pradesh Uttar Pradesh Orissa Assam

Table 5.24 Impact analysis on Infant Mortality Rates (IMRs)						
IMRs	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Middle Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra West Bengal	Kerala	Punjab	Punjab, Maharastra, Tamil Nadu	Kerala, West Bengal	
Medium Impact	Andhra Pradesh	Karnataka	Haryana Assam, Bihar	Haryana	Karnataka Andhra Pradesh,	Bihar Assam
Low Impact	Uttar Pradesh	Madhya Pradesh Gujarat Rajasthan	Orissa	Gujarat,	Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa

Table 5.25 Impact analysis on Child Mortality Rate (CMR)						
CMR	**High Exp.**	**Medium Exp.**	**Low Exp.**	**High Income**	**Middle Income**	**Low Income**
High Impact	Tamil Nadu, Maharashtra, West Bengal	Kerala	Punjab	Punjab, Maharashtra, Tamil Nadu	Kerala, West Bengal	
Medium Impact	Andhra Pradesh	Karnataka Gujarat	Haryana Bihar	Haryana, Gujarat	Karnataka Andhra Pradesh,	Bihar
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Orissa, Assam		Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa, Assam

Table 5.26 Impact analysis on Crude Death Rate (CDR)						
CDR	**High Exp**	**Medium Exp**	**Low Exp**	**High Income**	**Middle Income**	**Low Income**
High Impact	West Bengal	Kerala, Karnataka	Punjab, Haryana	Punjab, Haryana,	Kerala, West Bengal, Karnataka	
Medium Impact	Tamil Nadu, Maharashtra Andhra Pradesh	Gujarat	Assam	Maharashtra, Gujarat, Tamil Nadu	Andhra Pradesh,	Assam
Low Impact	Uttar Pradesh	Madhya Pradesh Rajasthan	Orissa, Bihar		Rajasthan	Madhya Pradesh, Uttar Pradesh, Orissa, Bihar

The levels of impact on education and health vary greatly between States, but these variations comparisons reveal widespread inefficiency in translating expenditure into educational and health outputs.

Public expenditure on education and health per *se* will not necessarily produce progress towards the MDG education and health target of educational and health outcome indicators. Other factors – poverty, adult literacy, education and health on the demand side, and efficient, effective resource management and quality on the supply side – exert a more powerful influence. Increasing expenditure without tackling these may be as effective as pushing on a piece of string; higher outlays may be absorbed by higher unit input costs and falling levels of efficiency. Without

reforms in education and health expansion programmes may increase temporarily the outcome indicators but this progress may be unsustainable.

CHAPTER 6

Chapter 6 summarizes the findings and policy implications of the study, acknowledges the limitations of the study and suggests some further research directions.

Scope for Further Research

The study adds to the existing body of knowledge, from a long-run equilibrium perspective, by disagreeing with the belief that expenditure is an unambiguous substitute for education and health outcomes. Evidences from this study shows that within certain levels of public spending on education and health, indicators are enhanced by expenditure rather than replaced by expenditure. Following this finding, it is interesting for further investigation whether expenditure information benefits intra-state human development indicators.

It is also interesting to pursue a similar study for the case of special –category states of India. It is interesting area for further exploration and if it can successfully introduce structural change into the panel model, the regression will have a better fit of the data and an improvement of the estimation.

Future studies on the econometric techniques that can be used to separate the simultaneous impact of public expenditure through lagged impact on outcomes indicators in the panel data model also be useful.

Last, but not least, further research to improve the simulation results are also worth pursuing.

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