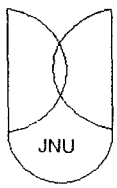
Public Expenditure in Indian Elementary Education Sector after National Educational Policy, 1986.

Dissertation submitted to the Jawaharlal Nehru University in partial fulfillment of the requirements for the award of the degree of
Master of Philosophy



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Certificate

Certified that this dissertation entitled 'Public Expenditure in Elementary Education Sector after National Educational Policy, 1986', submitted by Suman Seth in the partial fulfillment of the degree of Masters of Philosophy is entirely his own work and has not been considered for the award of any other degree either at this or any other University.

We recommend that this dissertation be placed before the examiners for evaluation.

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Acknowledgement ~

I take this opportunity to thank all persons who have helped me immensely to create this dissertation. First I would like to thank my supervisor Prof. Archana Aggarwal, who, in spite of tremendous pressure of her own work, took out time to guide me to produce this dissertation. Two persons who deserve special mention for helping me throughout this procedure and without whose help it would not be that easier for me to finish this dissertation within time are Prof. Vikas Rawal and Sugatada (Sugata Bag). I would like to thank the staff members of JNU, NIEPA and Exim Bank Library for all the help and cooperation they provided to me and of course the staff members of our center Bishtji, Bacchi singh ji. Thanks to Mr Tokas of school computer center. I am also grateful to my friends, seniors and juniors for their help and cooperation. Thanks to Bishu, Gublu, Rupam, Ananya, Suvra, Partha, Subrat, Sunando, Surajitda, Manishda for staying beside me during this procedure. And at last special thanks to mom, dad, bhai and mou for their moral support and being with me – always.

Alas if still there is any mistake, it solely goes to me.

Suman Seth

5th July 2004 *Suman Seth*

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CHAPTER I

Introduction:

Form the early days of the development of economic doctrines, economists conducted enquiries into the nature and causes of wealth of nations. The mercantilists viewed trade as only source of economic growth. Land was identified later as the key factor of economic growth by the physiocrats. By the end of eighteenth century cause of growth was explained in terms of capital and later Marxian economists praised for labor. At the beginning of the second half of the century the crown was captured by educational economists and economics of education has become a subject of concern. As an immediate result of the revolution in the area of economics of education, led by Theodore Schultz, huge investments flowed in educational sector.

India is a developing country. There are different aspects of development. Education is one of them. Education builds up the human capital for a country. Human capital accumulation is also necessary for a country, especially a developing country, for its economic development. An economy determines accumulation of human capital by increasing the desire of individuals to augment their level of education. Elementary education is one of the significant parts of the education system of a developing country. Now which stages of education constitute elementary education? – Elementary education constitutes primary and upper primary or middle stages. Now length of primary schooling differs from states to states. In some states it constitutes class I-IV, where as for some states it constitutes class I-V. Similar incident is for upper primary education. For some states it is another three years after

class V and in some states it is another four years after class IV. But duration of elementary education as a whole is classes I-VIII.

A developing country is always expected to strengthen its base in any aspect and then build blocks on that strong base. In education system as well, a developing country should, at first instance, strengthen its base level education and then should concentrate to precede further to capture the higher-level effect. Otherwise, it will have some dire consequences in the form of intensifying the inequality in education level, in the country as a whole, which will be broadened further. Since independence Indian government is trying to make improvement in education sector, especially elementary education sector. In constitutional mandate of 1950 it was proposed to provide, within a period of ten years from the commencement of this Constitution, free and compulsory education to all children until they complete the age of 14 years. But unfortunately the government could not keep its' word. After some years in others education policy government had tried to put emphasis on elementary education but it was in 1986 a New Educational Policy (NEP) was announced. In this policy it was again proposed to provide free and compulsory education to all children up to 14 years before the advent of twenty first century. But we have already entered the new century and it is very sad to mention that we are far away from reaching universalisation of elementary education. Though some states suggest that Gross Enrollment Ratio (GER) has reached near-about 100% for primary education but Net Enrollment Ratio (NER) is far away from reaching universality. The case of upper primary enrollment is even poor. The GER for those stages are not even close to 100%. What is very natural in Indian education system is massive dropout after primary education stages in spite of making elementary education compulsory.

What does compulsory education mean? There can be three meanings of compulsory education. *Firstly,* by compulsory education it can be meant

that all children have to attend school as compulsion. *Secondly,* all parents are compelled to send their children to school. And *thirdly,* state should take the responsibility to send all the children to school by modifying its strategy. Now among the three, third one is of more and more importance over the previous two. Since for the section of people living under abject adversity and darkness of illiteracy it is not possible to comprehend the benefit of sending their children to school and the children themselves are very puerile to understand the need for education. Moreover, the private sector will be reluctant to invest in those sectors since return to the investment to these sectors accrue to the country as a whole instead of going into their feast. So state is the only option, which is going to take the whole responsibility to implement new strategies and invest into this sector.

At the initiation of our five year plans, i.e. in 1950-51 total government expenditure on education was 64.46 crores, which was 7.92% of all the government expenditures and 0.64% of GDP. But this amount gradually rose to 14.42% of total expenditures and 4.3% of GDP. And in actual terms it rose to 572160 crores. Expenditure in elementary education as a proportion of GDP in 1950-51 was 0.30%, in 2001-02 it rose to 2.02% of GDP. So what we infer that over the last fifty years since independence, expenditure on education has increased by 8800 times. But it has to be kept in mind that this amount has taken into consideration with the manifold increase in total number of students and moreover, the inflationary factor which has also increased several times. Unfortunately, if these things were taken into consideration then it would be found that there has been a meager increase in per capita expenditure in all the sectors of education. Again, a lot of improvement is seen in number of schools. From the inception of planning period in 1950-51, number of institutions has increased by three fold for primary schools and 15 times for upper primary schools. In 1950-51 the ratio of upper primary schools to primary schools was 1:15, which improved to 1:3.2 in 2000-01. Number of teachers has increased

by 17 times for middle schools and 3.5 times for primary schools in 2001-02 over 1950-51. All these information sound very good and reflect a boon situation for Indian elementary education system. But if then, we take into account the factor enrollment into consideration then notion is bound to change. In 1950-51 total enrollment in primary education was 22.3 million, out of which 19.2 million in primary and 3.1 million in upper primary, which increased to 156.6 million, out of which 113.8 million in primary and 42.8 million in upper primary. So what is evident is that number of primary students has increased 7 folds and upper primary students increased by 14 times. So the picture is that increase in number of primary students enrollment if much more higher that the increase in number of schools and for upper primary schools the ration of number of schools to enrollment has remained almost same. Then where is the improvement? These are some of the incidences, which reflect the scarce condition of elementary level of education. That is why this sector needs a massive improvement, which necessitates sound investments. In this paper we shall basically discuss the expenditure pattern of Indian state governments and what determines their expenditure patterns. First of all let us take into account the experts opinion.

Literature survey:

According to Tilak, 1984, investment in education in developing economies, like South Asian countries pose a serious problem for various reasons. In this paper he basically deals with the fact that Political Economy leads switching of investments from elementary education to higher education for the sake of the elite class. However, according to him, allocation of adequate resources for any sector, including education is almost impossible, due to scarcity of capital; both in terms of quality and quantity. Investments are affected by two ways. Firstly, it does not permit allocation of adequate

resources for education and secondly, rapid expansion of physical resources is a prerequisite to adequate investment in education.

Some strange results have been derived in this paper. It has been derived that investment in education as a percentage of GNP has no relationship with GNP per capita. Moreover, investment as a proportion of GNP is also not related to enrolment ratios. But the question is – can any relationship exist between GNP per capita and investment in elementary education as a proportion of GNP? If per capita GNP increases for a country then investment in all sector should upgrade simultaneously remaining the investments as a proportion of GNP almost same. Let, there be two countries; A and B with per capita GNPs, π_A and π_B with $\pi_A > \pi_B$. Let both the countries have same population N, so that GNP for A is higher than that of B. Now as country a is endowed with more wealth, it will spend more in every sector in its economy, may be it education or power or others and at last the investment in each sector as a proportion of GNP will remain the same. I mean to say that though the two countries have different per capita GNPs, their investment on education as a proportion of GNP will be the same. So it can't be rightly concluded that countries with higher (lower) per capita GNP will spend more (less) as a proportion of GNP. A viable relationship can be established if we try to check the possibility of a relationship between per capita domestic product and per student expenditure.

In another paper, Roy, Kamaiah and Rao, 2000, have tried to find out the per student normative cost and compared with actual expenditure made on education. Here they have constructed a pooled regression with fifteen large states and six years, ranging from 1992-93 to 1997-98. Education, till higher secondary, has been split up into three stages, primary, secondary and higher secondary. Primary stage constitutes students from classes I to V. Secondary stage constitutes classes VI to X and higher secondary stage constitutes classes

XI and XII. The variables that have been identified as determinant of cost are number of students enrolled, proportion of dropout, student teacher ratio, price differences across states, and literacy rates of corresponding states in corresponding years etc. They have derived some basic results as follows. For primary and secondary stage they have found student teacher ratio as insignificant and literacy level as significant, which is contradictory to Tilak's (1984) paper. According to Tilak, expenditure on education is not significantly related to literacy levels, but in this paper it has been shown that literacy level has significant effect on primary and secondary education level. Other results those require special mentions are that increase in the level of enrolment reduces significantly the per capita cost of education whereas increase in dropout rates significantly raises the per capita cost. After calculating the normative costs they have compared those costs with actual costs and found a massive state-wise and intra-sector wise variation in per capita expenditure level. Now though they have used the data on enrolment rates and dropout rates but the data are not totally flawless. According to the paper of Heyneman, 1980, enrolment ratios are inflated since in 1977 Manipur and Nagaland reported enrolment ratios of 152% and 133%, which include over aged children in 6-11 group. These may be misleading in a sense that figures, for Ministry of Education, are supplied by headmasters who are not neutral sources at all. Governmental assistances and subsidies are frequently linked to enrolment. There are inevitable biases in data collected from officials who are responsible for the reputation of their institutions. However, when economic incentives are involved, then figures must be treated with special care. One study in this context was conducted by Agricultural Economic research Centre (Delhi University) on 1961 data. This study discover an appalling result, the enrolment figure reported to Ministry of Education on age group 10-14 was twenty percent higher that reported in census. That means, official enrolment statistics was over-estimated. Until now, it cannot be claimed that official figures have been almost rectified.

Again according to Tilak, 1988, cost of education are both general and specific purpose tools in that they are used for different purposes – for planning, forecasting, projecting and analyzing, decision making and policy formulation. According to him, cost of education, in most economies, are incurred in two domains – individual and institutional domain. Individual domain is concerned with expenditures incurred by students and their parents. This expenditure is not the matter of concern of this paper since this paper only deals with public expenditure. Now institutional cost includes recurring and non-recurring costs. Recurring costs include salaries of teaching and non-teaching staff, maintenance of buildings, maintenance of equipments and furniture, games and sports, hostels and other items. Non-recurring costs include expenditure on purchase of building, furniture, equipment etc. Now in a government budget there are different kinds of expenditure; revenue expenditure, capital expenditure etc. revenue expenditure consumes almost 85-95 percent of total government budget. Moreover, share of state government and local bodies in revenue expenditure is almost 95 percent of total education expenditures.

In the paper, presented by Ramchandran Rawal and swaminathan, 1997, they have tried to explain the fact of investment gap in primary education. In their introductory part, they have pointed out some interesting facts in Indian literacy level. According to their information, in 1991, total number of illiterates was 321 million, which was larger than the population of India during independence of 314 million. Until now, total number of illiterate, according to census 2001, is 302 million. Therefore, India has entered a new millennium with more than thirty million illiterates. What they have tried to derive in this paper is the required expenditure to universalize primary education, i.e. the additional investment required by each state over the existing expenditure level to provide primary education to all children.

Calculation shows Kerala as the only state where additional expenditure needed for universalisation of elementary education is only 0.6 percent of State domestic product. Interstate variation is explicit here as well. The states, which are required to spend less than four percent of state domestic product to achieve universalisation of primary education are – Kerala, Punjab, Haryana, Tamil Nadu and Gujarat. The states required to spend between four to five percents are – Karnataka, Andhra Pradesh and West Bengal. Lastly the states required to spend more than six percent of state domestic product, unsurprisingly include Rajasthan, Bihar, Madhya Pradesh, Orissa etc. According to their estimation, around 3.1 percent of gross domestic product should be spent on elementary education but currently it is only 1.66 percent of gross domestic product in 2001-02. What has, basically, been concluded from this paper is that huge difference in expenditure prevailing across states and that is required to be minimized over time.

According to Shariff and Ghosh, 2000, as well, public expenditure in education in India has been inadequate in meeting the needs of education for all. Almost all the developed countries spend around five to six percent of their gross domestic product on education but India, at present, spends only 4.03 percent in 2001-02. Though expenditure on education as a proportion of gross national product is low for China but taxes are levied on farmers and government employees, on sale of private businesses, on construction and the proceeds are utilized for financing education. Though in successive versions of NPE in India, it has been suggested to spend six percent of gross domestic product but the target has remained illusive till now. According to this paper, for a balanced growth of education, an economy should start by investing a large part of its educational budget on elementary education. Only when the goal of universalisation of elementary education has been achieved, the emphasis can be shifted towards tertiary level of education. Some case studies have been exemplified in this paper, as Japan spending 84 percent of its

educational budget on six years of elementary education and expenditure on tertiary education increased gradually afterward. They calculated an additional outlay of 3.3 percent of gross national product is required for universalisation of elementary education. Moreover, it has been found in this paper that per capita net state domestic product is negatively correlated to expenditure on education as a proportion of NSDP, which is in contradiction to tilak's paper, 1984. Concluding remarks of this paper include

1. The relative share of elementary education in total education budget has declined over time in most states.
2. Share of education declined from 4.1 percent of gross national product in 1990-91 to 3.8 percent in 1995-96.
3. Per pupil expenditure on education, especially by less developed states declined.

In his paper, 2004, J.B.G. Tilak exemplified that in India education is considered as merit good up to elementary level and beyond elementary level, education is considered as non-merit good. It has been proposed in some current government policies to reduce the scale of subsidies in non-merit goods including higher education by 50 percent through phased increases in user charges or cost recovery rates. People could be ignorant about benefits of education, may not appreciative to value of education, may be unwilling to invest in education or may be unable to foresee the implications of education. But governments are expected to have better information than individuals or families and more wise to comprehend and judge the long run benefit and blessings of investment in education. According to him, the individual recipient himself or herself benefit to a greater extent than he or she is aware of. The effect of education on wages may be known but the likely impact on productivity, family health, nutrition, ability to make self-decision is less likely to be anticipated. Consumer ignorance is a typical case that necessitates public subsidization. Tilak has mentioned some facts about intra-

sectoral allocation of resources in education. According to his calculation, relative priority accorded to higher education has drastically plummeted. As a proportion of gross national product, public expenditure on higher education has declined from 0.55 percent in 1989-90 to 0.39 percent in 1998-99. This proportion was one percent of gross domestic product in 1980-81. As number of students has increased in this period, per capita expenditure has also declined. The index of per student expenditure in higher education declined from 100 in 1990-91 to 84 in 1998-99. An obvious question arises here. As we know that total expenditure in education is limited then an increment in elementary education must be a cause of decreasing expenditure in higher education, i.e. a matter of intra-sectoral funding transfer.

Some discussions have also been made for India's under investment in education sector. Much progress has not been seen in education sector. Pupil teacher ratio, student per institutions, enrolment ratios all have remained stagnant throughout nineties. In a paper by JBG Tilak, 1999, this unfortunate situation of education sector has been discussed. As he has mentioned that according to NSSO calculation about 70 million children were out of school in 1986-87, which has risen to 90 million by 1995-96 and if this rate of progress continues then India would become a knowledge based society of the 21st century with about 100 million children who perhaps never been to school. According to calculations, additionally 136.8 thousand crore is additionally required during the next 10 years, which will provide a good pupil-teacher ratio of 1:30. Now pupil-teacher ratio is 1:59. Extra amount of investment will improve physical access to schools, provision of instructional materials.

It has also been evident from Tilak's paper, 1984 that elite classes are always patron of higher education and elementary education is neglected. Again, profit motive of private corporations prevent themselves to invest in primary education. So the only one door open for investment in education and

that initiative has to be taken by governments. There is a vertical imbalance in expenditure pattern in education between state and central government. Out of total expenditures, 85-90 percent is borne by state governments and local bodies leading contribution of central government insignificant. Again from another paper presented by Tilak, 1988, we have the information regarding expenditure structure of Indian economy. Beside these vertical imbalances there exist imbalances in revenue and capital expenditure as well. Expenditure heads under revenue account are salaries paid to teachers and non-teaching staffs, maintenance of building and furniture, expenditure on sports etc. Capital expenditures include the heads of establishment cost of building, purchase of furniture, equipments etc. Now, in case of India, revenue expenditure occupies more than more that 90 percent of total expenditures. Where as capital expenditure and loan and advances contribute 3-4 percent. Share of total expenditure in education may seem to be a quarter of total state governments budgeted expenditure but in terms of total central government budgeted expenditure share of education expenditure is very low, which means, out of total education expenditure state revenue expenditure occupies a major share of near about 90 percent. Again, out of total state revenue expenditure major contribution was provided by non-plan expenditure. Till now we were discussing about the expenditure structure of the governments, but these expenditures vary in massive portion across states, which is also evident from most of the papers of our literature survey. In the paper, presented by Roy, Kamaiah and Rao, we find that the normative costs, they calculated varies across states. In the paper, presented by Ramchandran, Rawal and Swaminathan, we find that additional requirement of expenditure to achieve universalisation of primary education varies across states. Kerala is required to spend an additional 0.6 percent of net state domestic product to achieve universalisation of primary education, whereas Bihar, Orissa etc require more than 6 percent of net state domestic product to spend to accomplish universalisation of primary education. So state-wise variations are in extant

and it is of utmost interest in this paper to determine the factor and how they determine the expenditure pattern. As we have mentioned earlier in chapter three that after 14 years of National Educational Policy, 1986, many programs have been launched, many policies have been implemented but we are on the same platform; no significant improvement has come out till now. It was recommended in Kothari commission, 1966, to spend 6 percent of Gross domestic product on education, which is illusive till now. At present India has been able to reach a mere 4 percent of gross domestic product. Now as we mentioned earlier that near about 90 percent of expenditure is incorporated in state revenue then it should be of interest to examine the determinants of state revenue expenditure.

Out of total state revenue expenditure, teacher salaries constitute a major share; almost 75-80 percent. So, obviously, number of teacher is going to be major determinants of total state revenue expenditure. More number of teachers means more amount of expenditure. Apart from salaries of teaching staff, revenue account constitutes salaries of non-teaching staff, maintenance of buildings and furniture, expenditure on sports, fee concession etc. Now, number of teachers depends on number of students. Ratio of student to teacher is one of the major factors to fulfill the totality of the aim of universalisation of elementary education. So, to reduce the ratio of student to teachers to a reasonable level, numbers of teachers have to be increased along with increase in enrolment and consequently increasing the expenditures. Unfortunately, in the elementary stages, ratio of student to teacher is significantly high to almost 59:1. Now other expenditure heads that are components of revenue account are non-teaching staffs, maintenance of building and furniture, expenditure on sports etc. These expenditure heads are partly influenced by number of institutions and number of students. Number of non-teaching staff is basically depended on number of institutions. As more institutions are established more non-teaching staffs are required but this is also partially depended on number

of students as well. But the expenditures on maintenance of furniture, buildings, expenditure on sports, concession on fees (basically education is free up to elementary level) depend on the largeness of institutions, which in turn is determined by the number of students.

In Tilak's paper, 1984, it has been mentioned that large resources are necessary prerequisite for expenditure on education. But again in a later paper, 1988, he derived a meager correlation between different expenditure heads and state-wise net state domestic product. Net state domestic product is generally considered as resources available to states. In that sense, it is of our area of interest to check whether really, in Indian context, resources, available, determine the expenditures, i.e. whether poor states are spending less and vice versa.

From the annual reports on education, presented by Ministry of Human Resources and Development, we can be inferred about the facilities provided to the scheduled castes and tribe students in elementary level of education. Emphasis had been given to the development of education for the backward classes in National Educational Policy, 1986, which was further updated in 1992. Emphasis had been put on the removal of disparities among backward classes by attending to the specific needs for bringing equality. In order to enhance the access to primary education of scheduled castes and tribes children, the norm for opening of primary school, which is generally one kilometer walking distance from habitation of 300 populations, has been relaxed in the case of Scheduled castes and tribes habitations with 200 populations. All state governments have abolished tuition fees in government schools at least upper primary levels. In most of the states education is also free in the schools run by local governments for scheduled castes and tribes. Most of the states provide assistance to students belonging to economically backward scheduled castes and tribe communities for meeting other costs of

education such as textbooks, uniforms, school bags, transport etc. A fair percentage of actual beneficiaries under the scheme of national program of nutritional support to primary education are likely to be scheduled castes and tribes. In the expanded scheme of Operational Blackboard priority would be given to schools located in scheduled castes and tribes. So from the above discussion we find that existence of scheduled castes and tribes plays a crucial role in determining the expenditure patterns. Presence of more scheduled castes and tribes are bound to induce a state to spend more.

Lastly, in a paper, presented by J.B.G. Tilak, 1999, an emphasis has been put on higher education. It has been shown that higher education has been neglected throughout the decade of nineties, except for first few years. Per capita expenditure on student had been reduced drastically. Now, as total expenditure on education has been scarce, so an obvious question is bound to arise whether increase in expenditure on elementary education is associated with drastic fall in higher education. In other words whether higher education has been sacrificed as a consequence intra-sectoral competition, since according to calculation of Tilak, 1999, per capita expenditure on higher education has fallen from an index of 100 in 1990-91 to an index of 84 by the end of nineties.

So we discussed about the financing of elementary education till now. But why is elementary education is so important? Why should a developing country invest into education? Over the past thirty years, much effort has been expended in quantifying the effect of education on social and economic development and the results manifests greater investment in education. Education leads to broad economic and social benefits for individuals and for society: Better health of children, lower infant and child mortality rates and higher productivity. These benefits are greatest once elementary education broadly covers the population. Now why are we putting

stress on elementary education rather than higher secondary and higher education? Answer is simple. We need to achieve a goal of development step by step, i.e. we have to accomplish a lower level development first and then we have to set out for its advancement. In 2001-01 far less than 100 % students were net enrolled in elementary education. So if we concentrate on higher education without solving the elementary education then inequality in education among the citizens of India will increase over time.

Arguments for expanding education have been based on, generally, three beliefs. 1) An educated population is more productive than an uneducated one. 2) Literacy is essential for modern societies to function and 3) schools and curriculum play an essential role in transmitting national and social integration.

Impact of Elementary Education:

There are two types of impact of Elementary Education. One is *socio-economic* and another one is *purely economic*.

Let us discuss the *socio-economic* effects of elementary education first. Over the past decade a large body of international evidence has accumulated suggesting that education, particularly of girls than only for boys, also results in a higher productivity and other activities that increase household welfare. For example, the schooling of girls, later in the girls live, reduce fertility infant and child mortality rates, improve household health by influencing nutritional and health care practices and improve their children's school performances. Elementary education is important in all these. Let us elucidate these phenomena as follows. As our intention in this paper is to discuss about the Indian scenario, hence we are illustrating some Indian evidence, though the effect for all the third world countries will be the same.

- **Improved Fertility Rates.**

India is a developing country with a burgeoning population growth. What is required for this country is an immediate population check. Reduction in fertility rates is a bright option for that. Empirical evidences on the link between mother literacy and fertility rates depict an inverse relationship. Common causes that explain the relationship are as follows.

i) Educated females desire for smaller families due to the fact that they are able to anticipate the need to spend more wealth and more time on each child to provide better care and nourishment.

ii) Irrespective of income effect, female education is commonly assumed to raise the opportunity cost of children in a sense that rise in women's wages, due to education, would raise the shadow price of children and thus reduce fertility.

iii) Aside from these income effect and price effect female education also changes preferences. It leads mother to value the need for education for her children more highly and moreover it induces mothers to switch her preferences from child quantity to child quality.

iv) As a female becomes educated, she puts more time on attending institutions in her initial stages of life and that in turn delays her marriage. Consequently the average minimum age of marriage declines over time and fertility is reduced.

A review of 22 world fertility surveys reported that education was associated with lower marital fertility in all but two cases (Appleton, 1996). In Indian perspective, the effect of female literacy on fertility rate has a larger significant effect on fertility rates in 1991 than in 1981, considering the fact that average level of education for the literate women was higher in 1991 than a decade ago (Dreze and Murthi, 2001).

Determinants of fertility rates

The determinants of differences in fertility rates are complex. From table 1 we can see that Total Fertility Rate (TFR) is decreasing with increase in literacy level. For illiterate women TFR is 3.47, which has an explicit decrease to 2.26 for women completed middle school according to National Family Health Survey (NFHS), 1998-99. In 1992-93 the rates were 4.03 and 2.49 respectively. Considering the fact that female literacy has an inverse effect in fertility we see that fertility rates decline with schooling level and moreover fertility rate declines over time. For women, who have completed middle school the rate was 2.49 in 1992-93, have fallen to 2.26. Similar effect is seen for the other two literacy categories of women. Table 2 depicts the median age at first birth for the women at their specific ages. Here also, explicitly, median age of first birth increases with level of education. More education means *late marriage*, which results in late first birth and lower fertility rate. It is explicit from the following table that for each and every current age group, the median age at first birth is higher with higher level of education, owing to the fact of late marriage for women with increasing education level depicted in table 3.

Another intervening factor in reducing fertility is use of *modern methods of birth control*. Now as it is explicit from the following table that on 42.9% and 39.2% of illiterate women knows any method and any modern method of using contraceptive. Knowledge of use on contraceptive is promoted with the attendance level in school. 55.5% of women who have completed middle school have knowledge regarding any method of contraception. So it is evident that use of contraceptive increases with schooling among women, which lead to reduction in fertility.

Again, more literate women are expected to be more versed in gathering information from Radio, television or newspapers regarding any

news. For reduction in fertility what they need is to have information regarding *family planning*. A massive improvement is manifested from table 5 below for the literate women. For illiterate women access to radio, television and newspaper is very poor. Access to newspaper is bound to be poor due to the fact that illiterate women can't read and write.

- **Better Child Health and nutrition:**

Schooling also has a strong effect on behavior in health care, particularly child health. Cross country studies have shown that, even after adjusting for other economic factors, mother's schooling of one to three years is associated with a 20% fall in the risk of childhood death and that this effect increases with further educational attainment (World Bank, 1997). It is also found from different studies that mother's education has an even greater effect on the survival of daughters that of sons. It is evident from table 6, below, that the difference between children ever borne and children living decreases with increasing school attainment of mothers.

Table 7, depicts a similar kind of result. It deals with *infant mortality* by mother's school attainment level. It is evident from the table that infant mortality and child mortality falls drastically with improvement in mother's schooling. For illiterate women infant mortality and child mortality are 86.5 and 39.5 per thousand. But it decreases significantly to 48.1 and 10.5 per thousand for the mothers completed middle schooling.

Table 1.1: Fertility Rates by Educational attainment.

Female Education	*Total Fertility Rate*	*Wanted Fertility Rate*
Illiterate	3.47	2.54
Literate and < Middle School	2.64	1.99
Middle School complete	2.26	1.81

Data source: National Family health survey, 1998-99.

Table 1.2: Median age at first birth

Education	*Current Age*						
	20-24	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**20-49**
Illiterate	18.5	18.2	18.3	18.6	18.6	18.9	18.5
Literate and < Middle School	19.8	19.4	19.2	19.4	19.4	19.7	19.5
Middle School complete	20.9	20.8	20.7	20.8	20.5	20.5	20.5

Data source: National Family health survey, 1998-99.

Table 1.3: Median age at first marriage in India.

Education	*Current Age*					
	20-24	**25-29**	**30-34**	**35-39**	**40-49**	**20-49**
Illiterate	15.5	15.3	15.2	14.9	14.7	15.1
Literate and < Middle School	18.0	17.1	16.9	16.7	16.6	17.1
Middle School complete	19.1	18.7	18.3	18.4	18.1	18.6

Data source: National Family health survey, 1992-93.

Table 1.4: Percentage of currently married woman knowing any contraceptive method and at least one modern method.

Education	*Knowing any method*	*Knows any modern method*
Illiterate	42.9	39.2
Literate and < Middle School	52.2	44.6
Middle School complete	55.5	49.7

Data source: National Family health survey, 1998-99.

Table 1.5: Exposure to family planning messages on radio and television.

Education	*Radio*	*Television*	*News paper*
Illiterate	25.9	25.8	1.2
Literate and < Middle School	48.2	56.0	21.6
Middle School complete	55.8	70.5	41.0

Data source: National Family health survey, 1998-99.

Table 1.6: Mean number of children ever borne and living.

Mother's Education	*Children ever borne (a)*	*Children living (b)*	*Difference (a-b)*
Illiterate	3.5	2.9	0.6
Literate and < Middle School	2.9	2.6	0.3
Middle School complete	2.3	2.1	0.2

Data source: National Family health survey, 1992-93.

Table 1.7: Infant mortality by mother's education.

Mother's Education	*Neonatal Mortality*	*Postneonatal Mortality*	*Infant Mortality*	*Child Mortality*	*Under five Mortality*
Illiterate	55.3	31.2	86.5	39.7	122.8
Literate and < Middle School	40.5	18.0	58.5	18.4	75.8
Middle School complete	33.7	14.4	48.1	10.5	58.1

Data source: National Family health survey, 1998-99.

Table 1.8: Child vaccination.

Education	*BCG*	*Polio*			*DPT*			*Measles*	*All*
		1	*2*	*3*	*1*	*2*	*3*		
Illiterate	59.1	76.3	69.4	50.9	58.7	51.0	40.2	35.8	27.8
Literate and < Middle School	82.8	90.4	85.9	72.8	82.6	76.8	66.7	61.8	52.3
Middle School complete	90.5	94.0	90.9	79.5	91.1	85.8	77.6	71.8	62.7

Data source: National Family health survey, 1998-99.

Neonatal mortality: The probability of dying in the first month of life.

Postneonatal mortality: The probability of dying after the first month of life but before the first birthday.

Infant mortality ($_1q_0$): The probability of dying before the first birthday (Neonatal + Postneonatal Mortality).

Child mortality ($_4q_1$): The probability of dying between the first and fifth birthdays.

Under-five mortality ($_5q_0$): The probability of dying before the fifth birthday.

Child mortality rates are probably influenced by prevalence of *immunization*. Again immunization of child increases significantly with mother's education. Immunization of children against six serious diseases, namely *Tuberculosis, Diphtheria, Pertussis, Tetanus, Poliomyelitis and Measles*, has been cornerstone of the child health care system in India. As part of National Health Policy, the National Immunization Program is being implemented in India on a priority basis. The government of India in 1978 with the objective of reducing morbidity started the Expanded Program on Immunization (EPI), mortality and disabilities due to these against Polio was introduced to the program in 1979-80 and Tetanus Toxoid for the school children was added in 1980-81. BCG was brought under EPI in 1981-82. Another addition to the program is vaccination against measles, introduced in 1985-86 (NFHS). It is followed from Table 8 that there is a significant increase in child vaccination among children with more educated mothers. Now as the children of today are the fathers of tomorrow, then it is very essential to provide them all the necessary vaccinations and educated mothers are successful in this respect. This example suggests how necessary elementary education is for mothers.

Again, death of children suffering from *Diarrhea* is also very severe for the children in India. Deaths from acute Diarrhea are most often due

to the dehydration that results from the loss of water and electrolysis. For this reason, nearly all diarreal deaths can be prevented by prompt administration of rehydration solution. As death of significant number of children is from Diarrhea, government has launched Oral Rehydration Therapy Program. Mothers are instructed how to manage Diarrhea by using Oral Rehydration Salt packet (ORS). Here also literate mothers are more conversant in using ORS packet and have knowledge regarding signs for medical treatment of Diarrhea. 77.2% of mothers, completed middle school, know to use ORS packet beside 51.2% of illiterate mothers.

Mother's schooling also influence children's *nutritional status* (World Bank, 1997). Children of more educated mothers are likely to be better nourished. From table 10, we have some idea of the difference made by literate and illiterate mothers of child nutrition. The proxy variables that have been taken here for nutrition effect are weight for age and height for age. It has been assumed that better nourished children shall have more weight and height than poorly nourished children of the same age group. The values of weight for age and height for age have been shown in standard deviation (SD) format. Each indices are expressed in standard deviation units (SD) from the median of the international reference population. The percentages of children, more than three and more than two SD units below the median of international reference population (-3sd, -2sd), are shown according to selected characteristics. What is importantly evident is that children of illiterate mother are more deviating from median weight and height of the international reference population. The deviation improves with improvement in mother educational attainment level. More than twice proportion of children are -3SD unit deviated from median height and weight of international reference population for illiterate mother beside the mothers who have completed middle school. So what we see here again that elementary education makes a lot of difference, rather improvement, again.

Table 1.9: Knowledge and ever use of ORS packet.

Education	*Knows about ORS packet*	*Percentage who know two or more signs for medical treatment of diarrhea.*
Illiterate	51.2	34.9
Literate and < Middle School	72.3	38.3
Middle School complete	77.2	42.1

Data source: National Family health survey, 1998-99

Table 1.10: Nutritional status of children.

Mother's Education	*Weight for age*		*Height for age*	
	-3sd	*-2sd*	*-3sd*	*-2sd*
Illiterate	24.1	55.0	30.2	54.4
Literate and < Middle School	13.1	44.6	18.3	40.7
Middle School complete	10.8	36.6	13.4	34.0

Data source: National Family health survey, 1998-99.

Table 1.11: Antenatal Care (ANC)

Education	*ANC at home*	*Doctor*	*No ANC*
Illiterate	7.3	32.1	48.4
Literate and < Middle School	4.8	62.1	19.3
Middle School complete	3.0	71.8	13.5

Data source: National Family health survey, 1998-99.

Table 1.12: Tetanus toxoid vaccinations and iron and folic acid tablets.

Education	*Number of Tetanus Toxoid Injections*			*Percentage given iron and folic acid tablets*
	None	*One dose*	*Two or more dose*	
Illiterate	35.3	9.1	54.7	43.6
Literate and < Middle School	12.5	8.4	78.4	70.4
Middle School complete	7.5	7.5	84.2	78.5

Data source: National Family health survey, 1998-99.

- **Antenatal and postnatal care for mother and child:**

Like child health and nutritional status women's health is also a matter of concern. Better male health in an economy leads to an improvement in productivity in a direct way, but contribution of better women health to economic productivity can't be denied. Better women health implies better health for future generation, since mother's health is directly related to child health. Now along with better women health, antenatal and postnatal care for mother and child fall among the bare necessities for reduction in child mortality and better child health. Let us provide the evidences for improvement in these areas along with betterment of mother's education. First of all let us consider the case for *Antenatal Care (ANC).* It is better for both mother and upcoming children if the ANC is taken from any specialized institution, particularly to consult any doctor. What is evident from the table is that more than double proportion of illiterate women takes ANC at home beside the women completed middle school. The condition is really poor in case of having no ANC care. 48.4% of illiterate women do not take any ANC care; this condition improves with education level of mother. More than double proportion of educated mother consults to doctor beside illiterate mothers.

Neonatal Tetanus is widely prevalent among the children in India. Neonatal Tetanus is caused by infection of the new born with tetanus organism. Neonatal Tetanus is most common when delivery takes place in an unhygienic environment and non-sterilized instruments are used for cutting the umbilical cord. Tetanus develops during first week or second week of life and is fatal in 70-90% cases. Two doses of Tetanus Toxoid vaccine, given to the pregnant women one month apart from during when she is 16 week pregnant and 20 week pregnant, are nearly 100% effective in preventing tetanus. Provision of iron and folic acid tablets are also very important for child health in initial stages. Again, it is explicitly evident from table 12 that proportion of

women having two or more, proper, dose increases significantly with their education level. 84.4% of women completed middle school and 78.4% of women, educated up to primary school, have proper doses of tetanus toxoid vaccination and 78.5% and 70.4% of women respectively have iron and folic acid tablets properly. So, here also, elementary education among mothers plays a crucial role.

Place of delivery also plays a crucial role in determining child survival. Chance of spreading tetanus is high in non-hygienic places during delivery. So, it is always better if delivery takes place in any health institution rather than at home. But unfortunately, from table 13, 81.4% of illiterate women prefer delivery at home where the chance of fatality is high. Only 17% of illiterate women prefer health institutions. This unfortunate situation improves with higher attainment of education level. 42.3% of women, educated up to primary level and 54.1% of women, completed middle school, prefer health institution, reducing the risk of child survival and accidents.

Like place of delivery, *assistance during delivery*, is also important both for child and mother survival. Doctors and nurses are more conversant in preventing accidents and the care that they provide can be surrogated neither by the traditional birth attendants nor by the relatives. But as is clear from table 14 that in general child of unfortunate illiterate mother take birth in the hands of traditional birth attendants and relatives. Out of the number of women surveyed only 24.9% of illiterate mothers achieve the assistance of doctors or nurses/midwives during delivery, the rest of 75.1% of mother give birth to their child with the assistance of either traditional birth attendants or relatives, whereas, the proportion of women, assisted by doctors or nurses/midwives, increase significantly with mothers education. The proportion increases to 52.7% for women, educated till primary school, and 66.6% for the women completed middle schools; provide the necessity for improvement in elementary education.

- **Prevention of AIDS:**

Like cancer the preventive medicines has still not been discovered for *AIDS*. It is a serious disease and often proves fatal and dangerous. It is the responsibility of the government to prevent this disease from spreading. But before prevention what we need is to inform the inhabitants about this plague. Only after everybody is well informed steps can be taken. But what we see from table 21 that most of the illiterate women are not even aware of the term AIDS. Only 18.4% is informed. Among the informed illiterate women the proportion that got the information from the newspaper is very less. Obvious reason is their inability in reading. For poor women radio and television may not be easily accessible but newspapers are. So what is needed is expansion of the light of education to those illiterate persons. And as it is evident that elementary education can make the thing better so our government must endeavor to improve that sector of the economy.

- **Preventing Tortures:**

In this patriarchal society women are still tortured by their husbands and other relatives. That is to be prevented but it is not possible to winnow them out individually and prevent the malpractices. But the indirect way to deal with it is to raise the education level. It is not the case that literate women are not facing mistreatment but the number of incidents is less. Since a literate woman can sustain without depending on other, an illiterate women cannot. Level of education may affect to whom they are marrying (Dreze and Murthi, 2001). As is evident from the table 16, collected from NFHS data, is that proportion of physical mistreatments and beatings is reduced by increase in the education level of the women.

Till now we were discussing the socio-economic effect of elementary education, let us now discuss the *purely economic* effects one by one. The

economic effects of education have been estimated using a range of techniques, including aggregate production functions, enterprise based production functions and rate of returns analysis. Aggregate production functions suggest that one year of in average education of work force can raise output by 13% and that increase in output level can contribute around one quarter of the increase in economic output (World bank, 1997). Different studies show that education has also a significant effect on agricultural production. An educated labor force can augment the technologies and farming practices. And rate of return analysis shows that different level of education has different rate of returns and return from elementary level education is highest. Let us now discuss the effects on the factors one by one.

Table 1.13: Place of delivery.

Education	*Health institution*		*Home*	
	Public	Private	Own	Parents
Illiterate	10.2	6.8	68.1	13.4
Literate and < Middle School	23.3	19.0	42.3	13.4
Middle School complete	28.5	25.6	32.8	11.1

Data source: National Family health survey, 1998-99.

Table 1.14: Assistance during delivery.

Education	*Doctor*	*Nurse/ Midwife*	*Traditional birth attendant*	*Relatives*
Illiterate	15.6	9.0	44.7	29.6
Literate and < Middle School	37.3	15.4	28.4	18.1
Middle School complete	49.5	17.1	21.0	11.7

Data source: National Family health survey, 1998-99.

Table 1.15: Source of knowledge about AIDS.

Education	*Percentage heard about AIDS*	*Heard from*		
		Radio	*Television*	*News paper*
Illiterate	18.4	33.6	61.7	1.2
Literate and < Middle School	53.8	39.9	76.3	15.7
Middle School complete	74.0	44.3	83.7	30.2

Data source: National Family health survey, 1998-99.

Table 1.16: Women's experience with beatings or physical mistreatments.

Education	*Beaten by any family member*	*Beaten by husband*
Illiterate	25.5	23.6
Literate and < Middle School	19.2	16.7
Middle School complete	15.2	12.1

Data source: National Family health survey, 1998-99.

- **Growth of the Economy:**

Recent measures of the effect of education have increasingly focused on the broad macroeconomic perspective. These measures try to capture the mechanism through which education if affecting the productivity of entire workforce and thus affecting the growth rate prevailing in the economy. A study of particular relevance for India examined eight East Asian export led economies by World Bank 1993 (World Bank, 1997). Its results show that increasing enrollment in elementary education – and later, secondary education – has been significant in explaining these economies' sustained high level of growth. For the last few decades these economics has grown several times as the rest of East Asia and Latin America. For the last few decades' elementary level of education has been the largest predicted contributor behind the economic growth rates of these countries.

Most of the studies find a positive correlation between educational attainment levels where some find that coefficient of educational variable does not enter significantly into growth accounting regression. Now, there are two ways in which educational investment can contribute to economic growth. Firstly, human capital can directly participate in production as a productive factor. In this sense, the accumulation of human capital would directly generate economic growth of output. This method is called *level effect* of educational investment on economic growth. Secondly, human capital can contribute to raising technical progress since education eases the innovation and adoption of new technologies. In this way, human capital affects productivity growth. This second effect is called the rate effect. The empirical findings suggest that education affect growth through rate effect than level effect. Physical capital accumulation is an investment decision of each individual; people accumulate human capital by spending time in school. Evolution of human capital, i.e. growth rate of average rate of educational

attainment, depends on two variables, the average level of output and present value of human capital and actual output determines the willingness of individuals to increase their educational level (Maria Jesus, 2001).

A work on effect of primary education on economic growth by Papergeorgiou, 2003, is of special mention. He used World Bank's STARS database for 80 countries for required data and ran regression on three sets of countries- High income, Middle income and Low-income countries. Motive was to derive the effect of primary and secondary education on growth of the economies. He assumed that primary education as, basically, helpful for final good production, whereas, post primary education as helpful in Research and development (R&D) production. What he derived was that for High-income countries post primary education had a positive and significant effect but primary education had not. Results were quite similar for Middle-income countries. But for the Low-income countries he derived an almost reverse result, primary education had a positive and significant effect. What it meant was that less developed countries benefited most from the accumulation of primary education employed in primary good production. One possible explanation of that result would be Rostow's development stages. Primitive economies benefit most from accumulation of primary education as they rely heavily on final good production. After improving their primary education the under developed countries could rip off the return from R&D in future. In this study papergeorgiou considered India to be under the category of low income countries. So what we conclude from the above discussion of effect of education on economic growth is that elementary level of education has a significant effect on raising India's economic growth.

- **Rise in Agricultural Productivity:**

A strong notion prevails that education dispels the darkness of adversity and brings the blessing of improvement. But how does it happen? An under-developed economy basically survives on agriculture and India is not an exception. Share of agricultural income in GDP was 24.7% in recent past, in the year of 2001. It may seem less but if we mention that 68% of employed are involved in agricultural sector then its sounds huge (Economic survey). Again using agricultural product as input generates 50% of manufacturing sector income. Lastly, out of total export volume of India 70% is generated, directly or indirectly, by agricultural sector. For the last few decades many works have been done in search for the relationship between education and agricultural productivity, and fortunately some strong positive relationship have been established.

At lease four years of Primary schooling is required to have a significant effect on farm productivity (Sharada Weir, 1999). According to this paper – unpredictable weather, pests, crop disease – all contribute to an environment in which farmer must adapt frequently in order to survive. There must be an efficiency advantage for the farmers who are better prepared to anticipate and cope with disequilibria. Thus even in the absence of an innovation, farm productivity can be enhanced by investing in education. From many studies in Asia, it is found that in modernized regions, mean increase in output owing to at least four years of education in several times higher than in traditional agricultural regions. Education may have both cognitive and non-cognitive effects upon productivity of labor. Cognitive effects of schooling include the transmission of information and formation of general skill and efficiencies. Again, non-cognitive skills produce changes in attitudes, beliefs and habits. Increase in education improves the numeracy along with literacy, which help in acquiring information and comprehending situations in a rapidly

changing environment. Improve attitudes, beliefs and habits induce to take more risk, adopt innovations and embrace productive practices. Benefit of investment in education not only helps the person concerned but also perpetuates to other household members or even to neighbors. In his paper, Sharada Weir, has mentioned about four stages of agricultural technology adaptation. *Stage one* is Traditional farming where information is perpetuated from father to son and no or little schooling is needed. *Stage two* tells about single input adoption (e.g. fertiliser), where basic education and numeracy is necessary, basic science knowledge is necessary, here, to understand the instruction and adjustment of quantities of the new input. *Third stage* is about adoption of more than one input where more education is required. And *stage four* necessitates the requirement for a further education since the farmer has to deal with irrigation-based projects. Sharada Weir has worked on another under developed country, Ethiopia, where some satisfactory results have been derived.

More school farmers in India, at the onset of Green Revolution, were more likely to adopt the new seed varieties. In particular, more schooled farmers may experience higher returns from the new seeds because they allocate inputs, such as fertilizer, better (Foster and Rosenweig, 1996). Faced with new information, educated individuals are better able to take advantage of technical change. In other words technical changes are likely to have a greater effect on profit in an educated population than in an uneducated one. In this paper the evidence has been derived from the period of Green Revolution using 4000 rural households. This paper concludes that the policies resulting in greater technical change are complementary with those increasing investment in schooling: The return to investment in technical change will in general be higher when primary schooling is accessible and the returns to investment in schooling will be higher when technical change is more. So not only technical change, but investment in schooling is also essential for increase in

productivity. In another study Foster and Rosenweig calculated that for every 1 rupee increase in profit due to the effect of exogenous technical change, households with primary schooling receive and additional 1.38 rupees (Rs).

- **Rate of return:**

Over several decades many of the economists have tried to calculate the rate of returns of education. They have basically tried to calculate two types of returns - private rate of returns and social rate of returns. Private rate of returns are used to explain people's behavior in seeking education at different levels and types and distributive measures of the use of public resources. Social rate of returns, on the other hand, can be used to set priorities for future educational investment. Two types of methods are there, as well, to calculate rate of returns - elaborate method and earning function method. The later has gained popularity due to its ease in estimation. What is basically found from then studies that among the mail levels of education, primary education continues to exhibit the highest social profitability in almost all the parts of the world. What Psacaropaulos have found that rates of return decline with the level of per capita income, i.e. for poor countries the rate of returns are higher. According to his calculation India's private rate of return was 29.3 and social rate of return was 33.4 in 1978. From the paper of Heyneman, 1980, we get some of the estimates on returns to education calculated previously, as follows. What is evident from table 17 is that social rates of return are always higher for elementary (primary and tertiary) education than for secondary and higher education. The explanation that can be put behind this fact is that in an underdeveloped economy, unlike developed economy, basically final goods are produced rather than research and development or other technologies, which require knowledge on higher education. Consequently in an underdeveloped country return should be higher for elementary i.e. base level education.

Table 1.17: Different social rates of returns.

Economists	Primary	Middle	Secondary	B.A.
Blaug (1980)	13.7	12.4	9.1	7.4
Psacaropaulos (1973)	20.2	16.8	-	12.7
Nalla Gounden (1967)	16.8	11.8	10.2	7.01
Pandit (1976)	13.4	15.5	-	10.7

So what is evident from this long discussion that for an underdeveloped country such as India, governments should put a significant stress on elementary education due to the essential role it plays behind the development. Development cannot be measured by mere growth rate of a nation; it basically depends on a feel good factor of its inhabitants. So as we have seen that expense on elementary education not only raises economic growth, agricultural production and has a higher rate of return, but also it has some socio-economic effects as well. As discussed earlier it helps in reducing fertility and mortality of child, improve health etc.

CHAPTER II

State of Indian Education System:

In the preceding chapter, we saw why India requires elementary level education. Working groups of Planning commission of India established ambitious target dates for achieving Universal Elementary Education (UEE) target that were revised throughout the 1960s and 1970s. In 1966 Kothari commission proposed achieving goal no later than 1986. A key strategy for achieving Universal Elementary education has been to provide an alternative to formal schooling for working children and girls not in school. In 1978, the department of education established a program of grant to states to develop non-formal education classes. The programs that have been initiated over time by the states since the initiation of National Policy of Education (NEP), 1986, to improve the status of Universalisation of Elementary Education (UEE), include – Operation Black Board (1987-88), Teachers Training Program (1986), District Primary Education Program (1994), Nutritional Support to Primary Education (1995), National Council of Teacher Education (1995), Sarva Shiksha Abhiyan (1998) etc.

Initiatives taken by Indian Government:

Operation Blackboard:

In pursuance of the NPE 1986, the *Operation Blackboard* (OB) scheme was launched in 1987-88 with the aim of improving the human and physical resources available in the primary schools of the country, existing as on 30 September 1986.

Three main components of Operation Blackboard:

- Provision of at least two classrooms in each primary school with facilities of separate toilets for boys and girls.
- Provision of additional teacher to single–teacher primary schools.
- Provision of essential teaching-learning equipment (TLE), like – maps, charts, games and other materials.

During the Eighth Five-Year Plan the scheme was revised in 1993-94 and was expanded to provide a third classroom and a third teacher to primary schools where enrolment exceeded 100 students. It was also extended to cover upper primary schools.

Teacher Education:

In accordance with the National Policy on Education (NPE) and Programme of Action (POA) 1986, the Centrally Sponsored Scheme of Restructuring and Reorganization of *Teacher Education* was taken up in 1987 to create a viable institutional infrastructure, academic and technical resource base for orientation training and continuous upgradation of knowledge, competence and pedagogical skills of elementary school teachers in the country.

District Primary Education Program (DPEP):

The *DPEP* is a centrally sponsored scheme providing special thrust to achieve Universalisation of Primary Education (UPE). The programme takes a holistic view of primary education development and seeks to operationalise the strategy of UPE through district-specific planning with emphasis on decentralised management, participatory processes, empowerment and

capacity building at all levels. The programme is structured to provide additional inputs over and above the provisions made by the state governments for elementary education. The programme fills in the existing gaps in the development of primary education and seeks to revitalize the existing system. The programme components include construction of classrooms and new schools, opening of non-formal/alternative schooling centres, appointment of new teachers, setting up of Block Resource Centres/Cluster Resource Centres, teacher training, development of teaching learning material, research-based interventions, special interventions for education of Scheduled Castes and Tribes. The programme mainly aims at providing access to primary education for all children, reducing primary dropout rates to less than 10 percent; The DPEP is an externally aided project. The Government of India meets 85 percent of the project cost and the concerned state government shares the remaining 15 percent. The programme, which was initially launched in 1994 in 42 districts of 7 states, has now been extended to cover 273 districts of 18 states: Assam, Haryana, Karnataka, Kerala, Maharashtra, Tamil Nadu, Madhya Pradesh, Chhattisgarh, Gujarat, Himachal Pradesh, Orissa, Andhra Pradesh, West Bengal, Uttar Pradesh, Uttaranchal, Bihar, Jharkhand and Rajasthan. In this paper as the time period that has been taken into account, is before th creation of Chattrisgarh, Uttaranchl, and Jharkhand, that is why those three states have been included in Madhya Pradesh, Uttar Pradesh and Bihar respectively: for the ease of calculation. Achievements, claimed by the central governments, are – opening up of 1,60,000 new schools, increasing the enrolment in DPEP district from 79.33 lakh in 1997-98 to 90.26 lakh in 2001-02, About 1,77,000 teachers, including Para-teachers or Shiksha Karmis have been appointed etc.

National Council for Teacher Education (NCTE):

The *National Council for Teacher Education* (NCTE) was established under the provisions of the National Council for Teacher Education Act 1993 (No. 73 of 1993) as a statutory body on 17 August, 1995 with a view to achieve planned and coordinated development of the teacher education system throughout the country, the regulation and proper maintenance of norms and standards in the teacher education system and for matters connected therewith.

National Programme of Nutritional Support:

A nation-wide programme of *Nutritional Support to Primary Education* (popularly called *Mid-day Meals Scheme* or MDM) was launched on 15 August 1995, with the objectives to give a boost to UPE and simultaneously impacting on the nutritional status of students in primary classes studying in government, local body and government-aided schools. During the current year, the programme has also been expanded to children of Education guarantee scheme (EGS) centres, which are being opened in the school-less habitations. The programme aims to provide wholesome cooked/processed food through local bodies/authorities such as Panchayats and Nagar Palikas who are expected to develop institutional arrangements for the purpose. Where such arrangement has not taken place, food grains (wheat/price) at the rate of 3 kg per student per month are distributed to the targeted children, subject to a minimum attendance of 80 percent. The central support under this programme is to provide food grains free of cost to children through the Food Corporation of India.

It is found from the above table that a definite improvement has occurred due to introduction of MDM Scheme. Enrolment, which was 100.2

percent some year ago, became 88.6 percent in 1995-96. But after the introduction of MDM scheme, it increased gradually to 95.7 percent.

Table 2.1: Improvement after implementation of MDM Scheme

Year	No. of Children (in crores)	Quantity of Food grains In MTs		Expenditure Incurred (Rs in crores)	Enrolment Ratio for Elementary Stage
		Allocated	Lifted		
1995-96	3.34	713223	536016	441.21	88.6
1996-97	5.57	1585388	1112489	800	88.8
1997-98	9.1	2567372	1810164	1070.38	91.1
1998-99	9.79	2706274	1147917	1600.15	92.1
1999-00	9.9	2767251	1401765	1500	94.9
2000-01	10.54	2480692	1517816	1300	95.7

This table is taken from 'Annual report on Education 2002-03' presented by Department of Education, Ministry of Human Resources and Development, Government of India.

Sarba Shiksha Abhiyan:

The Scheme of *Sarva Shiksha Abhiyan* (SSA) has evolved from the recommendations of the State Education Ministers' Conference held in October 1998, to pursue universal elementary education in a mission mode. The programme seeks to open new schools in habitations which do not have schooling facilities and strengthen existing school infrastructure through provision of additional classrooms, toilets, drinking water, maintenance grant and school improvement grant. Existing schools with inadequate teacher strength would be provided additional teachers under the programme. The capacity of existing teachers would be built by extensive training, provision of grant for developing teaching-learning material and development of academic support structure. The SSA also seeks to provide computer education in rural areas The SSA aims to involve the community in this effort towards UEE. The local village community is responsible for the following specific activities under the programme:

- Preparation of need-based habitation level plans based on detailed household survey
- Implementation of the approved habitation plan, including civil construction
- Monitoring of the functioning of school to ensure regular quality teaching

Current state:

In the previous chapter, most of the readings, mentioned, are concerned with improvement in primary education. Now from Indian evidence, what we find is that not only primary education is required but also upper primary level of education has equal or rather more importance. As we have seen from 2000-01 selected educational statistics that Primary level Gross Enrollment Ratio for India as a whole was 95.66 percent, but this ratio decreased severely as we move to upper primary level of education. Disappointingly, it was only 58.64 percent. This evidence shows how critical the problem of dropout rate was and is still now, since within 3-4 years nothing has changed overnight. This discontent performance had pulled down the overall elementary level school enrollment to 81.58 percent, far away from cent percent, i.e. universalisation of elementary education. Condition of girls' enrollment is little worse. For primary education the gross enrollment ratio (GER) was 85.9 percent, GER for upper primary education was mere 49.5% percent and overall GER for primary education was 72.36 percent. In the first chapter the factors have already been introduced which are influenced by elementary education. Correlations have been calculated between those socio-economic factors and level of school attendance of female across 25 states and the results have been presented in table 2.2. What is explicitly evident is that correlations are much higher with middle schools or upper primary education.

Table 2.2: Correlation between the socio-economic factors and level of school attendance of female

Variables	Middle school attendance	Primary school attendance
TFR (NFHS 2)	-0.46	-0.09
Median age at first birth	0.44	-0.02
Use any contraceptive method	0.40	0.13
Knowledge of at least one method of contraceptive use	0.47	0.20
Percentage of women exposed to family planning messages	0.71	0.23
Infant mortality	-0.73	-0.10
Child mortality	-0.61	0.06
Under five mortality	-0.72	-0.04
All immunization measures have been taken	0.63	-0.05
Percentage of mother having knowledge on ORS packet	0.58	-0.03
Percentage of women heard about aids.	0.76	0.17
Nutritional status(weight for height, -3SD)	-0.24	-0.02
Percentage of births delivered in a medical institution	0.54	-0.02
Median age at first marriage	0.59	0.07
Read newspaper at least once a week	0.57	0.01

Child and infant mortality of children are highly and negatively correlated with mothers completing middle schools. In other words, the states, with more mothers completing middle schools, result in better child health. These correlations are reasonably high for the states with more enrollments in middle schools but not so high for states with better primary schooling enrollments. For other factors as well we find some good results and correlations are strong with middle school enrollment than the primary enrollment. AIDS is a solemn disease and women of the states with more middle school girl enrollment are better informed about the disease. The worse reflection in enrollment ratio is basically caused by two states - Bihar and Uttar Pradesh. Girls' enrollments in those two states, at primary stages, are 64.49 percent and 50.30 percent respectively. Most of the states have achieved the GER of more than 90 percent for girls and more than 100 percent for boys. Enrollment ratios are defined by proportion of child enrolled out of total child population in that age cohort. Then how can the enrollment ratio be more than 100 percent? This is due to the presence of over aged children into that section of students. So improvement in primary education is not sufficient for India, it has to improve its upper primary level of education as well. So let us now check the expenditure pattern of India in education department. Total public expenditure was Rs. 35.6 per pupil in 1950-51, which increased to Rs. 3957.1 per pupil in 2000-01. An increase of 111 times but this impressive figure turns into a bland one if we incorporate inflation factor into consideration. Calculated at 1993-94 prices, total per pupil expenditure in 1950-51 was Rs. 524, which increased to Rs. 2488.9 in 2000-01, an increase of mere 4.75 times. The table is presented below showing the expenditures in current and constant (1993-94) prices.

Almost throughout '90s total per pupil expenditure had been stagnant. Some improvement had taken place since 1997-98. In 1997-98 there was an increase of 27.60 percent over the previous period. In 1998-99 and 1999-00 the

increment was 14.4 percent and 18.2 percent over the respective previous years. During the initiation of National education Policy 1986, the expenditure in constant price was Rs. 1273 per pupil, which has become Rs. 2489 per pupil. That means it has just got doubled. So from expenditure point of view there has been no significant improvement. Next two columns are presented for public expenditure in elementary education. Per pupil expenditure in elementary education is lower than total per pupil average expenditure. In 1950-51 it was only Rs. 13.33 per pupil, which increased to Rs. 2027.82 per pupil in 2000-01, a 152 time increment which is higher than the average increment in education as a whole. In other words expenditure in elementary education has increased as a proportion of total education expenditure.

Table 2.3: Per pupil expenditure on elementary education and education as a whole (Rs.)

Year	Education as a whole at current price	Education as a whole at current price ('93-94)	Elementary education at current price	Elementary education at constant price ('93-94)
1950-51	35.60	524.00	13.33	196.20
1987-88	723.30	1272.90	395.50	696.02
1988-89	824.70	1339.00	437.59	710.47
1989-90	960.40	1439.90	531.91	797.48
1990-91	1071.60	1455.30	605.44	822.23
1991-92	1144.70	1366.40	636.21	759.43
1992-93	1206.80	1325.00	740.32	812.83
1993-94	1308.00	1308.00	842.09	842.09
1994-95	1548.90	1413.30	893.21	815.01
1995-96	1710.80	1431.80	1052.40	880.78
1996-97	1937.70	1510.80	1220.13	951.32
1997-98	2639.50	1927.90	1361.25	994.26
1998-99	3262.20	2205.90	1661.00	1123.17
1999-00	3990.50	2607.00	1792.24	1170.87
2000-01	3957.10	2488.90	2027.82	1275.44

This table is derived from 'Financing Education in India' – Edited by JBG Tilak, NIEPA for the first two columns and the last two columns have been calculated from analysis of budgeted expenditure and selected educational statistics.

But again the situation losses its impressiveness if we consider the inflation factor into account. Then expenditure on elementary education shows an increase of 6.5 times in 2000-01 over 1950-51. The per capita expenditure grows from Rs 196.20 in 1950-51 to Rs 1275.44 in 2000-01. Over the fourteen years after New Education Policy (NEP), 1986, per pupil expenditure on elementary education, at constant price ('93-94), has increased at a rate of 4.77 percent per annum. A constant rise has been seen from the year 1995-96 onward. In this short period per pupil expenditure on elementary education has increased by 7.68 percent per annum.

Apart from public expenditure there are some other factors as well that influence education pattern. Those are number of teachers and number of institutions. Total number of teachers was 624 thousands, 538 thousands in primary school level and 86 thousand in upper primary or middle school level, in 1950-51. The number of teachers has increased to 3396 thousand, 1928 thousand in primary schools and 1468 thousand in middle schools, in 2000-01. So overall elementary level teachers have increased by 5.44 times, primary level teachers have increased by 3.58 times and middle school teachers have increased by 17 times. Now a huge improvement in seen on the teaching front. Let us now consider the case of number of institutions. Total number of elementary level institutions has increased from 223267 to 883667; just four fold increase. But number primary institutions have increased almost three times and number of upper primary institutions by 16 times. So what is explicit is a massive improvement in middle schools, where number of teachers has increased by 17 times and number of institutions has increased by 16 times. But still we have a severe amount of drop out in middle schools. But these refulgent figures become dull if we incorporate the increment of enrolment. In 1950-51 total enrolment was 22.3 million, out of which 19.1 million students were enrolled in primary stages and 3.2 million were in middle stages. This enrolment increased to 158.7 million, became almost seven times than it was in

1950-51. Out of the total enrolment in 2000-01 113.9 million was in primary stage and 44.8 million in upper primary stage. Again the number of enrolment was 14 times in 2000-01 than in 1950-51, almost nullifying the effect of massive increase in number of teachers and number on institutions. So if we calculate the ratio of pupil per teacher and ratio of student per institution then there is not going to be a significant difference. In 1950-51 pupil teacher ratio for elementary education, as a whole, was 35.74, which increased to 46.73 in 2000-01. This increase was basically a resultant of increase in pupil- teacher ratio in primary stages. Pupil teacher ratio increased from 35.69 to 59 whereas, for middle stages it decreased from 36 to 30.5. Students per institution also increased from 99.88 in 1950-51 to 179.6 in 2000-01. Like, pupil-teacher ratio, increase in overall students per institution was caused by increase in primary stages. In middle stages it rather improved. We present some graphs showing pupil teacher ratio, students per institutions and enrolments ratios separately for, throughout 50 years and throughout 14 years after National Educational Policy (NEP), 1986.

Now as we have seen previously growth rate of per pupil expenditure on elementary education has been 7.68 percent per annum over the six-year period from 1995-96 to 2000-01. This looks impressive beside the growth rate of 4.77 percent per annum over the fourteen-year period ranging from 1987-88 and 2000-01. But we should take some other factors into consideration. As we have discussed in the previous paragraph that number of teachers and number of institution has a crucial role to play in determining the expenditure pattern.

Table 2.4: Growth of different factors over the two separate periods (per annum)

Years	1995-96 to 2000-01	1987-88 to 2000-01
Growth of teachers in primary schools	1.80	1.24
Growth of teachers in middle schools	2.33	2.08
Growth of teachers in Elementary schools	2.02	1.57
Growth of Primary institutions	1.48	1.25
Growth of middle institutions	3.44	2.97
Growth of Elementary institutions	-1.94	-1.63
Growth of primary enrolment	1.22	1.57
Growth of middle enrolment	2.68	2.80
Growth of Elementary enrolment	1.61	1.89
Growth of expenditure on Elementary education	7.69	4.77

Values have been calculated using data from 'Analysis of Budgeted Expenditure on Education' and Selected Educational Statistics.

From the above table it is clear that growth in number of teachers and number of institutions has been much higher over the last six-year period, from 1995-96 to 2000-01. Annual growth in teachers of primary schools has been 1.80 percent beside only 1.24 percent over the fourteen-year period. Middle schools also achieve a higher rate of growth in the same department. Like number of teachers, number of institutions also grows in a higher rate during the period 1995-96 to 2000-01 than the period 1987-88 to 2000-01. Overall growth of institution has been 1.94 percent per annum over the period 1995-96 to 2000-01 beside 1.63 percent per annum during 1987-88 to 2000-01. Strikingly, growth in total enrolment has been lower, 1.61 percent per annum, during 1995-96 to 2000-01 beside the growth during 1987-88 to 2000-01; it had been 1.98 percent per annum. Now per pupil expenditure basically rises owing to increase in number of teachers and institutions and falls due to increase in the number of enrolments. So the impressive growth rate of per pupil expenditure, over the later six years, is owing to higher growth rate of

number of teachers and number of institutions and falling enrolments. Had enrolment been grown at the same rate the condition would not seem so impressive.

Total number of enrolment has shown a continuous increase over all the period, i.e. growth in enrolment has always been positive, which is a sign of improvement. But what had been the performance in Gross enrolment ratio sector? Gross enrolment ratio is defined as percentage of enrolment out of total population into that age cohort. Overall gross enrolment ratio in elementary education was 82.29 in 1987-88. For primary education it was 97.9 and for middle school education it was 55.1. By the year 2000-01 this ratio for overall elementary primary education became 81.6, a fall! For middle schools it became 58.6 and for primary education the condition became critical since it fell to 95.7. So, where is the improvement? Where was the money spent on? Population is increasing over time and proportion of non-enrolled students has risen from 17.71 to 18.4. Then, what does it imply? There was an increase in the number of non-enrolled children, whom the government could not provide the basic level of education to. The change in gross enrolment ratio has not been uniform over the years. It fell sharply during 1993-94, to 72.3, and then increasing gradually. The trend of gross enrolment ratio is depicted in chart 3a and 3b. Chart 3a describe the growth in gross enrolment ratio over the 50 years from 1950-51 to 2000-01 and chart 3b describe the growth of the same over the 14 years period after NEP, 1986. Now if we compare the relevant government policies then we find that, after implementation of Operation Blackboard (1987-88) and Teacher Training Program (1986) there was no improvement as such. By operation it meant a quick action that had to be taken immediately. It was progressing slowly to its goal as overall elementary enrollment gradually increased from 82.29 percent in 1987-88 to 87.7 percent by 1991-92, but it fell sharply to 77.2 percent by 1992-93 and further to 72.3 percent in 1993-94. Then the government was compelled to take some new and

innovative steps. Government introduced - District Primary Education Program (1994), Nutritional Support to Primary Education (1995), National Council of Teacher Education (1995), Sarva Shiksha Abhiyan (1998), etc to augment the level of enrolment ratio. Though Enrolment Ratio was upgraded over time but the progress was really slow and till 2000-01 it could not recover the 1987-88 level of enrolment ratio.

Chart 1a, 1b, 2a, 2b depicts the growth in number of teachers and number of institutions over the fifty years period ranging from 1950-51 to 2000-01 and for the period of fourteen years after NEP, 1986, ranging from 1987-88 to 2000-01. It is evident from the chart 1a that during the initial stages of planning situation of middle schools was poor; students per institutions were very high but by the next two plans a large emphasis was put on developing the upper primary stages of schooling as is depicted in chart 1a, that number of students per institution fell drastically from 230 to near about 130. It was of course an improvement since from the table below it is evident that during the decade of 1951-61, number of students increased by 82.29 percent whereas, number of institutions increased by 265.28 percent. This was the cause of sharp fall in SPI. But from the third plan onward SPI was gradually increasing and by 1990 it reached almost the same figure that prevailed in 1950-51. This was not due to a sudden deluge of students. Since for the next decades, growth rate of upper primary institutions have never surpassed the growth rate of upper primary students. During the decade 1961-71 the growth rate of middle institutions has been marginally lower than growth rate of students in that stage but for the next two decades the growth rate of number of upper primary institutions has been almost half of the number of enrolments. But at the last decade again number of upper primary institutions has risen at a significantly higher rate than upper primary enrolments. But the last decade fall in the category of our research, so it is possible to make a microanalysis of this decade. From Chart 1a what we find that for four years, from 1990-91 to 1993-

94, total enrolment was stagnant but institutions increased almost at the same rate and owing to that reason SPI fell sharply. Another important thing is to be noticed that Gross Enrolment Ratio (GER) for upper primary stages also fell sharply by 1993-94 and 1994-95. Though they increased in the later stages of 90s but could not recover the level it achieved during the initial years of 90s. So after the first year of initiation of NEP, 1986, the level of GER for middle schools was 55.1, which increased to 62.1 in 1990-91 but by 2000-01 it became only 58.6. So we saw the pattern of middle institution, let us now see the pattern of primary institutions. Over the fifty years, from 1950-51 to 2000-01, SPI for primary institutions increased in a steady rate, because growth of primary institutions has never been higher than the growth of primary enrolments. Over the last decade of 1990s SPI for primary schools, as well as overall elementary level, has remained almost same, except for the years 1992-93 and 1993-94, when it improved little bit. But, unfortunately, that fall was the cause of a decrease in enrolment rates. Primary GER fell sharply to 84.6 and 81.9 by the years 1992-93 and 1993-94 respectively beside 100.2 in 1991-92. Just the next year of NEP, 1986, the enrolment ratios in primary and overall elementary stages were 97.9 and 82.29, which, instead of improving, fell marginally to 95.7 and 81.6 respectively.

Table 2.5: Decadal growth rates of schools, teachers and enrolments

Decades	Primary enrolment	Upper primary enrolment	Primary teachers	Upper primary teachers	Primary institutions	Upper primary institutions
1951-61	82.29	116.13	37.92	301.16	57.58	265.28
1961-71	62.86	98.51	42.86	84.93	23.60	82.47
1971-81	29.47	55.64	28.58	33.39	21.09	30.83
1981-91	31.98	64.25	18.56	26.09	13.43	27.75
1991-01	16.84	25.88	17.33	23.58	13.87	36.19

Figures have been calculated by using data from different issues 'Selected Educational Statistics'.

Like SPI, pupil teacher ratio (PTR) also showed a marked increase over the first decade of planning for middle institutions. From table 3, we find that number upper primary teachers increased by 301.16 percent beside an increase of 116.13 percent in number of students. But after that the situation has almost been same for the next decades. Only for the last decade the situation has improved slightly and increases in number of enrolment and number of teachers has been almost same. But if we analyze the period after NEP, 1986, then we see that there has been no change, neither improvement nor degradation, in PTR. Again what we find is that after implementation of NEP, 1986, there has been no significant improvement.

Lastly, chart 4 has been plotted, showing expenditure on elementary education as a proportion of GDP. It is evident from the chart that by 1987-88, 1.54 percent of GDP was spent in elementary education but the proportion was gradually decreasing for the next years and could not recover that level until 1997-98. After that it increased marginally to 1.66 percent by 2000-01. That mean in expenditure front, as well, no improvement is found.

After discussing the current education state of India let us derive a model, which will explain the expenditure pattern of elementary education. We have seen that India could not even get close to the desired target. Now what have been the determinants of this elementary education expenditure after the period of 1986? We are going to set up the model in the next chapter.

Chart 2.1a: Change in Student Per Institution (SPI) over the fifty years after independence.

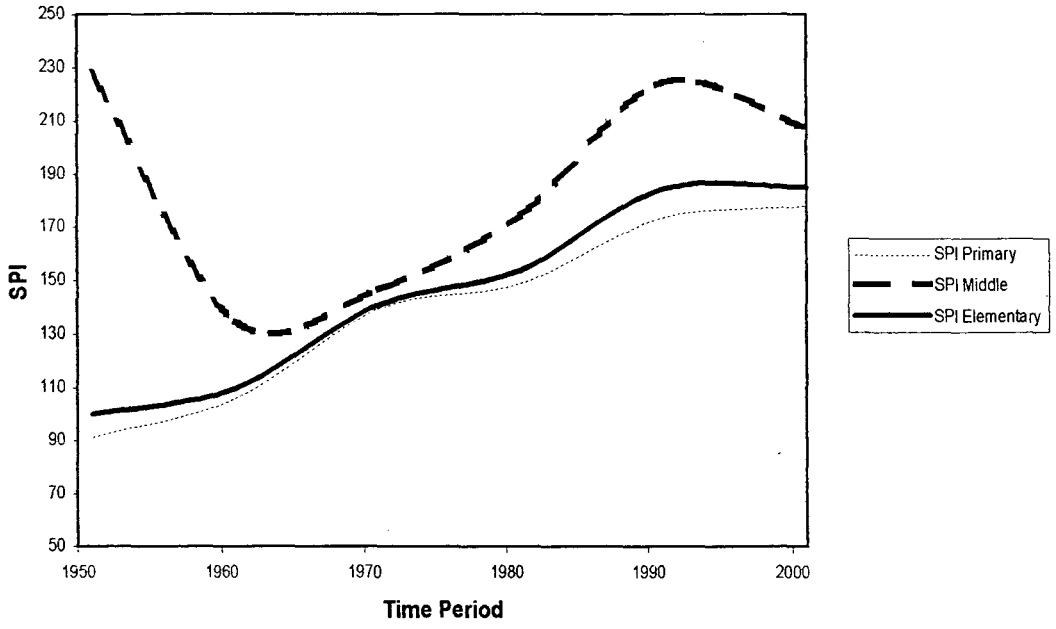

Chart 2.1b: Change in Student Per Institution (SPI) over the fourteen years after NEP, 1986.

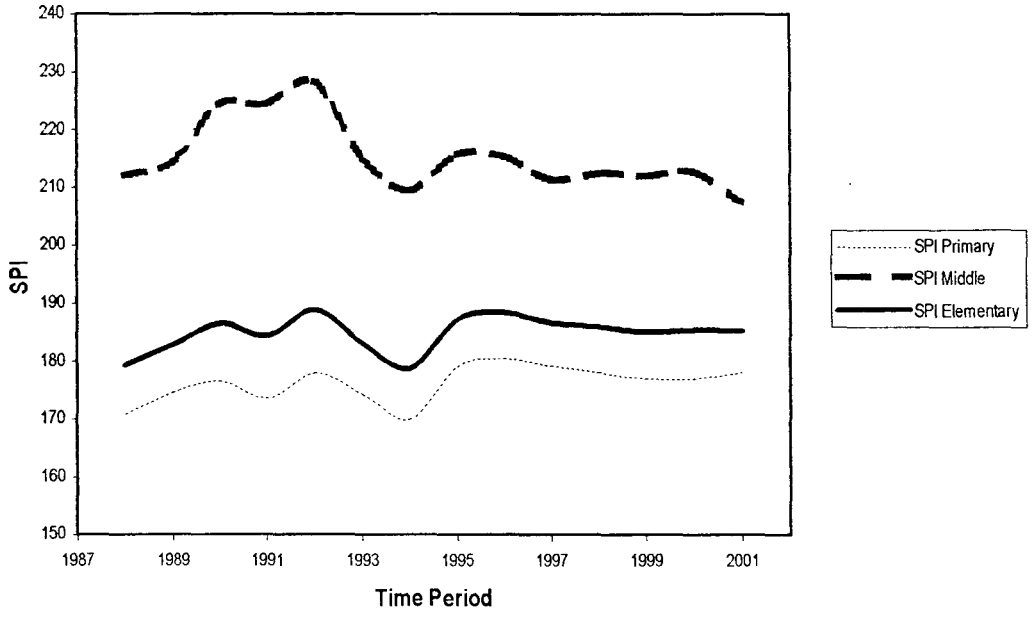

Chart 2.2a: Change in Pupil Teacher Ratio (PTR) over the fifty years after independence.

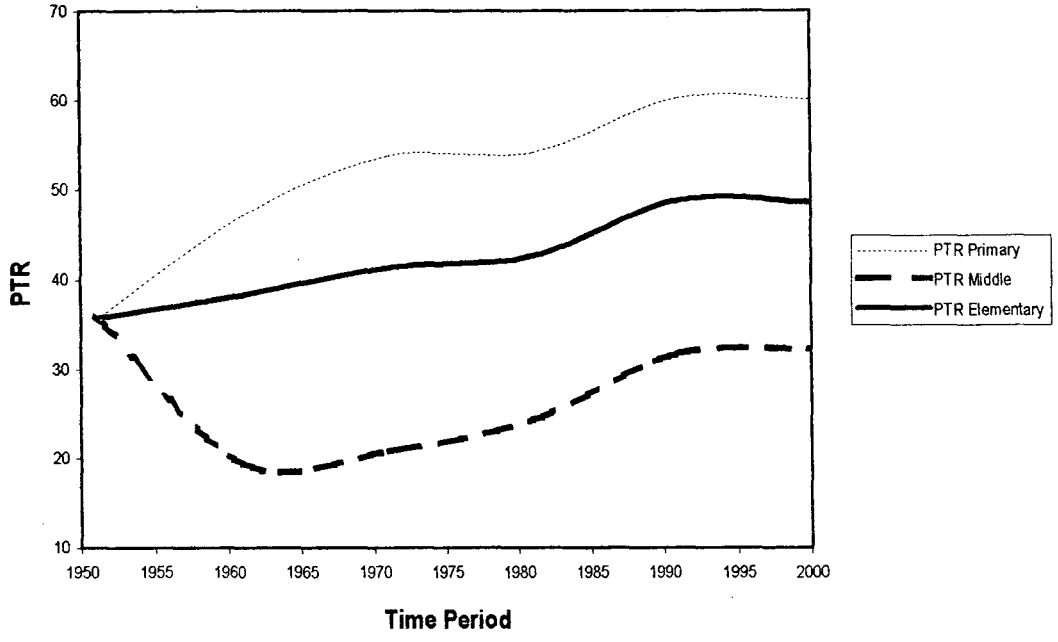

Chart 2.2b: Change in Pupil Teacher Ratio (PTR) over the fourteen years after NEP, 1986.

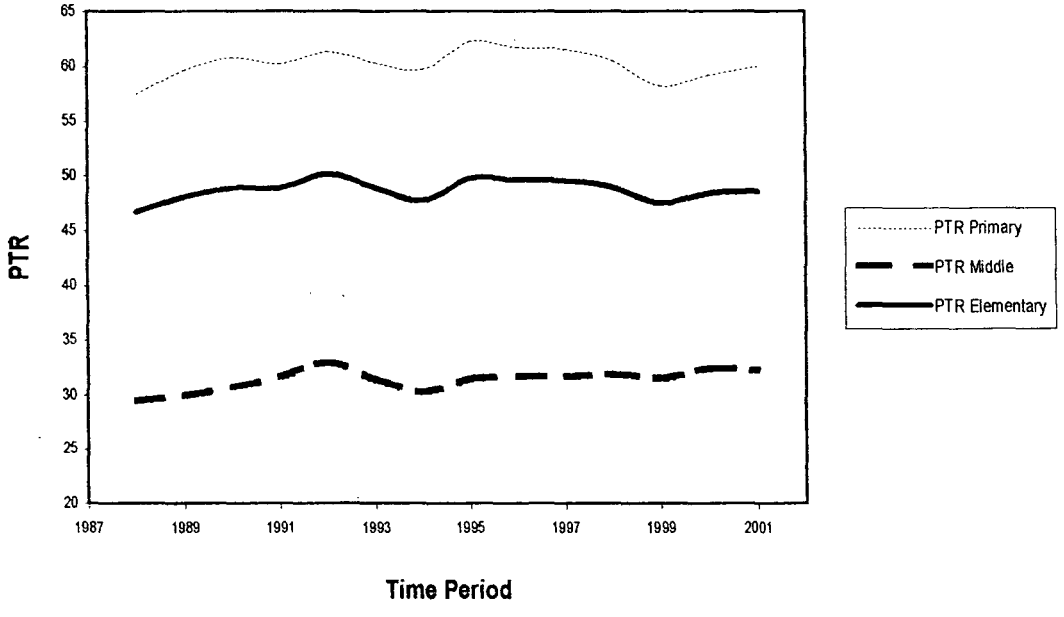

Chart 2.3a: Change in Gross Enrollment Ratio (GER) over the fifty years after independence.

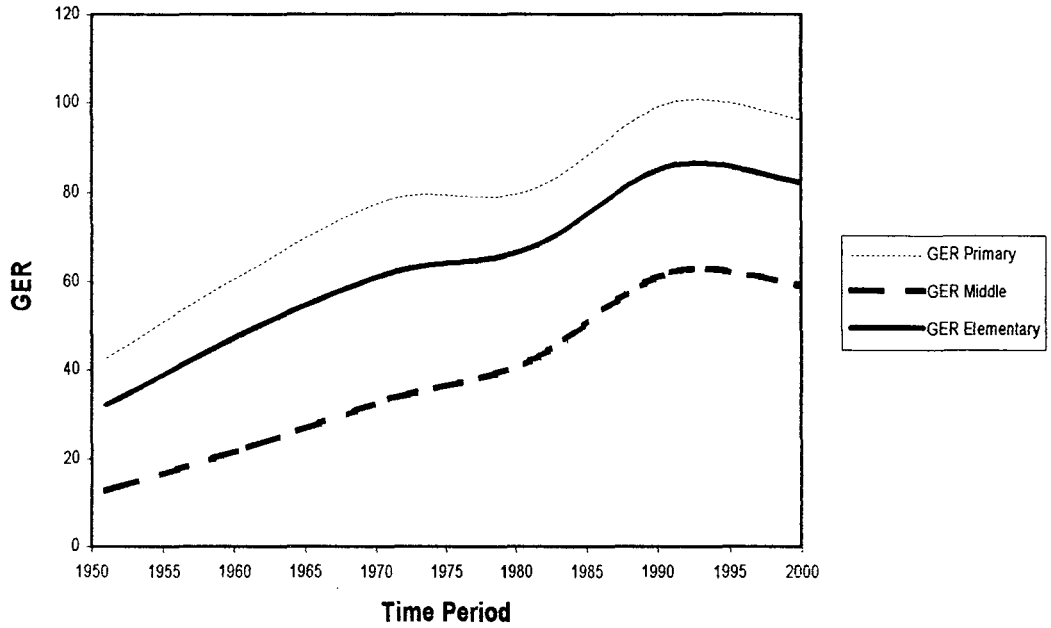

Chart 2.3b: Change in Gross enrollment ratio (GER) over the fourteen years after NEP, 1986

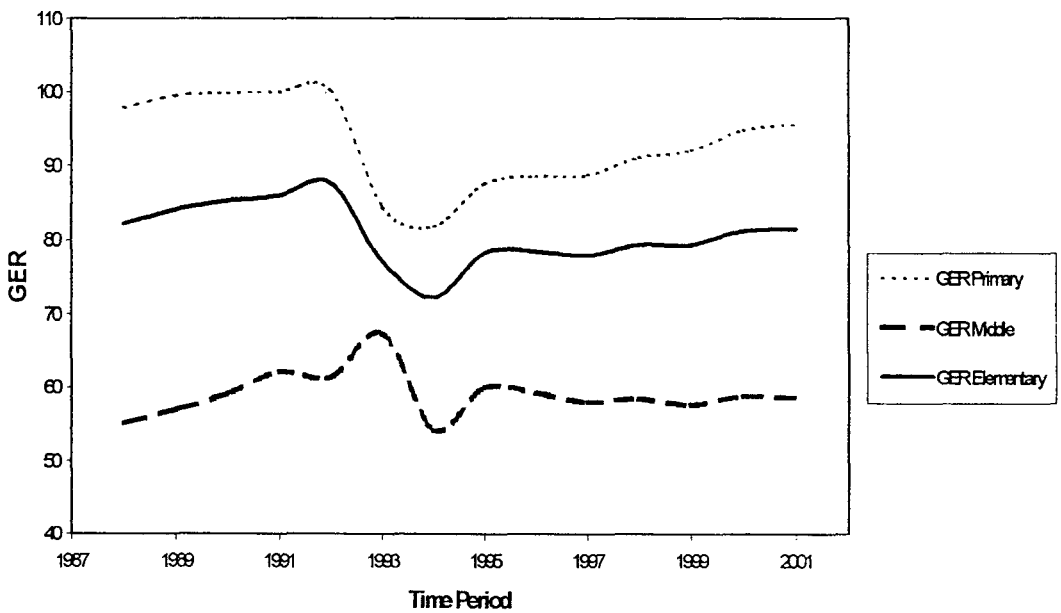

Chart 4: Elemenrary Education Expenditure as a proportion of GDP

CHAPTER III

Model:

In a developing country there are different aspect of developments. Let us assume that the citizens of that country have a grand utility function (U), which needs to be maximized, with respect to some constraint. Now, let us take the different sectors as different commodities. So the commodities are education (E), power (P), road-transport (T), railways (R), telecommunications (L), etc. Total utility of all the citizens, rather the country as a whole consists of these sectors as commodities. Now the constraint is total money available to that country.

$$\therefore \text{Maximise } U = U(E, P, T, R, L, ...)$$

$$\text{Subject to } M = a_E E + a_P P + a_T T + a_R R + a_L L + ...$$

Within the feasible set of money income the country needs an optimum allocation of resources among those sectors. By maximizing the utility function relative to a constraint, we derive the demand function of each sector. Now when the demand function is available government can infer about the total demand for that commodity. Now government is required to produce that commodity in his industry. The equilibrium will be achieved when total demand is equal to total supply of that commodity.

$$\therefore D_i = S_i \text{ ; where } i = E, P, T, R, L, ...$$

Among all these commodities we are only interested in one, education. Demand for education can be split up into some factors. In other words total demand for education is subdivided into some sub-demands.

$$\text{i.e., } D_E = \Sigma d_i , \qquad \text{where } I = 1, 2, \ldots.$$

To meet all this demand government needs to spend money that has been in its treasury. Total supply of fund to education sector is what available to government and every sub-demand has a unit cost, which is to be met. Now total expenditure required is nothing but the sum total of expenditure required for each and every sub-demand. If total demand is D_E and each sub-demand is measured by d_i then

$$E_{ER} = \Sigma e_i d_i \text{ ; where, } i = 1, 2, \ldots..$$

Where, E_{ER} is total expenditure required in education sector. e_i is unit expenditure required for sub-demand d_i. So total expenditure required is the sum total of expenditures required to meet each sub-demand. Now if total resource available to government is E', then in equilibrium total expenditure required should be equal to total expenditure available.

$$\therefore \mathbf{E'} = E_{ER}$$

Here, we have established a model and then have empirically verified the strength of the variables in determining expenditure patterns. As we want to check the effect on expenditure in elementary education, the explained variable that have been taken is per student expenditure in elementary education for each state, instead of expenditure as a proportion of net state domestic product. We have already discussed the superiority on the later over the former in the earlier chapter, where literature survey has been illustrated. Increase in per student expenditure in elementary education measures the importance a state puts on each pupil, while expenditure, as a proportion of

Gross Domestic Product may remain constant if Gross Domestic Product and expenditure on education increase or decrease in same proportion.

The demand side factors are the explanatory variables for this model, which will explain the expenditure pattern on elementary education. The explanatory variables that will determine the pattern of expenditure in elementary education are 1) Pupil teacher ratio 2) Student per institution 3) Proportion of scheduled castes and tribes in total students 4) Per capita expenditure in Net State Domestic Product 5) Per capita expenditure on higher education 6) a dummy variable which incorporates the hilly, deserted and low populated area. Let us now give some explanation why we have chosen these variables.

1) **Pupil teacher ratio:** - Pupil teacher ratio, defined as number of students per teachers, is an excess demand factor. In India teachers' salaries account for a major share in state revenue account. So, it is obvious that expenditure will increase along with increase in number of teachers. Moreover, total teachers have increased from 2214 thousands in 1987-88 to 3396 thousands in 2001-02. This growth is bound to raise the expenditure significantly. But as we have considered our dependent variable as expenditure per pupil, it is better to take pupil per teacher instead of total teachers. Now increase in the number of student will reduce the burden of expenditure spent on teachers by the operation of economies of scale. This increase in excess demand, pupil teacher ratio (PTR), results in a fall in price level, which is nothing but the per student expenditure in elementary education (PCE), i.e. $\delta PCE/\delta PTR < 0$.

2) **Student per institution:** - Here we have a similar kind of variable. This variable also works as an excess demand factor as students per institution (SPI). Beside state expenditure on teacher salaries, states

have to bear some other expenditure as well. These are – salaries of non-teaching staff, fee exemption, expenditure on maintenance of buildings and furniture, expenditure on sports etc. Now these factors depend on the size of the institution, which in turn depends on the number of students in that institution. Salaries of non-teaching staff decrease with increase in number of students but the other expenditure heads increase with increase in the number of students. So this variable should have an ambiguous sign. It may be positive or negative depending on which factor has a stronger effect. If per pupil salaries of non teaching staff off sets the other per pupil expenditures then this variable as a whole will have a positive impact, otherwise the impact will be negative, i.e. $\delta PCE/\delta SPI < 0$ if other expenditures is offset by salaries of non-teaching staff, otherwise $\delta PCE/\delta SPI > 0$.

We have included this variable instead of enrollment ratios and drop out ratios. Enrollment ratio cannot be treated as true indicator since it does not incorporate the intensity factor into account. Firstly, if number of institutions is very low then higher enrollment ratio indicating a lower PCE is quite misleading. Secondly, as capital expenditure is very low then it is of interest to check how total enrolment affects the rest of the revenue expenditure pattern apart from teachers' salaries.

3) **Proportion of SC & ST in total student:** - Proportion of scheduled castes and tribes students in total number of students (PSCST) will raise the cost of education and $\delta PCE/\delta PSCST > 0$.

We have included this variable for the following reasons.

i) The department of education continues to lay special emphasis on SC and ST. The National Policy on Education (NPE), 1986, updated in 1992, lays special emphasis on the removal of the prevailing disparities

and equalization of educational opportunities by attending to the specific needs of those who have been denied equality so far.

ii) In order to enhance the access to primary education SC/ST children, the norm for opening of primary school, which is generally one kilometer walking distance from habitation of 300 populations, has relaxed in the case of SC/ST habitations in whose case the norm is to have a primary school within one kilometer.

iii) All state governments have abolished tuition fees in government schools at least up to upper primary level. In most of the states, education is free in the schools run by local bodies and in private aided institutions.

iv) Most of the states provide assistance to students belonging to economically backward, SC and ST communities for meeting other costs of education such as textbooks, uniforms, school bags and transport etc. In the expanded scheme of Operational Blackboard (OB) priority would be given to schools located in SC/ST habitations.

4) **Per Capita NSDP:** - As mentioned by Tilak, 1984, that provision of abundant resources is a prerequisite of development in education, especially elementary education, where almost all the expenditure has to be met by governments. Now a state's wealth can be measured by its per capita state domestic product (PCNSDP). So more per capita net state domestic product means more resource available in the hand of state government leading to more investment in elementary education i.e. $\delta PCE/\delta PCNSDP > 0$.

5) **Per Capita Expenditure on Higher Education:** - Share of expenditure on education, as a proportion of SDP hasn't increased significantly over the years. But a thorough study shows that share of

expenditure on elementary education as a proportion of total education has increased after declaration of National Educational Policy, 1986. Where is it coming from? Is it a resultant of sacrifice on the higher education front? Since expenditure on higher education as a proportion of total expenditure on education has fallen from 23 percent in 1987-88 to 13 percent in 1999-00. This fall in total expenditure on higher education should affect per capita expenditure on higher education adversely since number of students is increasing over time, i.e., $\delta PCE/\delta PCEHE < 0$.

6) We had taken another demand side factor, which is a dummy (D_1), variable and incorporate the hilly, less populated and backward and small states. Due to adversity cost of education is going to be higher in these states comparison to other states suffering from less adversity, i.e., $\delta PCE/\delta D_1 > 0$.

7) The last variable that we have chosen is another dummy variable D_2 to incorporate the differentiated relationship between expenditure in elementary education and higher education for the years ranging from 1993-94 to 1997-98. Prediction is that the relationship should be negative. Since what we want to say is that elementary level expenditure has been increased at the cost of higher-level education, i.e. $\delta PCE/\delta D_2 > 0$.

So we have the Theoretical Model as a whole as: -

$$PCE = \alpha + \beta.TP + \gamma.SI + \delta.PSCST + \tau.PCNSDP + \mu.PCEHE + \nu.D_1 + \phi.D_2 + \varepsilon.$$

The coefficients of the variables measure the costs of respective factors. α is intercept, and β, γ, δ, τ, ϕ, μ, ν are slope coefficients and ε is error term, which incorporates the effect of the rest the effect.

CHAPTER IV

Data collection:

After construction of a model, it is essential to search for data to empirically verify the model. First of all the period needs to be mentioned over which we are going to test the model. For this paper the time, that has been concerned, is after the New Education Policy (NEP), 1986, till 2000-01, the data has been collected for fourteen consecutive years, i.e. from 1987-88 to 2000-01 and for all the 25 states. In our research paper we have tried to take all the states into consideration. We could not take into account three present states – Jharkhand, Uttaranchal and Chattrishgarh, since they were not established during the initial stages of our study period and consequently the relevant data are not available separately from their parent states. As we have mentioned several times that we are basically concerned with the elementary level of education, so, the data that has been collected, are basically on primary and middle schools. According to the Education Policy elementary stage of education includes the age group of 6 to 14 years of age. Now the age cohort of 6-14 years of age falls in the category of primary and middle school stages. In some states primary level of education constitute classes I to IV, but in some other states primary level constitute classes I to IV. And for some institution middle school constitute classes VI to VIII and for some others constitute classes V to VIII. As a whole elementary level of schooling, i.e. primary plus upper primary level of schooling, constitutes classes I to VIII in all states.

The variables that we have introduced in the model are - 1) Pupil teacher ratio 2) Student per institution 3) Proportion of scheduled castes and tribes in total students 4) Per capita expenditure in Net State Domestic Product 5) Per capita expenditure on higher education 6) a dummy variable which incorporates the hilly, deserted and low populated area. For each variable data

have been collected from multiple sources. Let us now describe the sources as follows, one by one.

To calculate pupil teacher ratio we need to have state-wise data on enrolments and state-wise data on teachers. We have collected these data from different issues of Selected Educational Statistics. We have collected the data in isolated form for primary schools and upper primary or middle schools and then summed it up to finally calculate pupil teacher ratio.

Next for Student per institution we need to have state-wise data on enrolments and institutions. These data have also been collected from Selected Educational Statistics and then arranged to arrive at the desired variable.

As we have already discussed earlier in our literature survey that existence of large resources in the hand of state is thought to be a prerequisite for investment in elementary education. It is a sole responsibility of the state to invest in elementary education since private entrepreneurs are not going to be attracted to invest into this stage of education. Moreover, a developing economy cannot exclusively rely on household expenditure since this is also scarce in supply and emphasis on household expenditure may create an adverse impact in the form that households may become reluctant to send their children to school at their own cost. So, to achieve the goal of universalisation of elementary education endowment of states is an effective criterion. Now an obvious question comes; how to measure the endowment for states. We can think of Net state domestic product (NSDP) as a proxy for state's endowment. But if we consider total NSDP as our explanatory variable then it explains a little since total NSDP explicitly depends on the size and population of the state. A large state should have more NSDP. Hence, to nullify the effect of the size of states or the size of the population, total NSDP for each state has to be divided either by corresponding area of the state or by the corresponding size

of the population and the later is a better option taking into account the factor of population density. So to measure the endowment of the states we are going to consider the variable in terms of per capita net state domestic product (PCNSDP). Now data regarding per capita NSDP have been collected from different issues of Economic Surveys.

Next variable that we have taken into account is per capita expenditure on higher education. Out intention, for inclusion of this variable, is to test whether increment in per capita expenditure in elementary education is a resultant of a sacrifice of expenditure on higher education. Whether expenditure has been switched from higher education to elementary education. Since after last few years of 80s, proportion of expenditure has been plummeted drastically throughout nineties and increased marginally only at the last year of this century. Now, calculation of per capita expenditure requires acquiring isolated data on state governments total revenue expenditure on higher education and total number of students in the stage of higher education. In the category of higher education we have included students from PhD, Master of Arts (MA), Master of Science (MSc), Master of Commerce (MCom), Bachelor of Arts (BA), Bachelor of Science (BSc), Bachelor of Commerce (BCom), Bachelor of Education (BEd), M.B.B.S (Doctor). We have not included IITs and IIMs, since they fall in the category of technical education. Expenditure data have been collected from Different issues of Analysis of Budgeted Expenditure on Education and Budgetary Resources for Education. For years 1987-88 to 1993-94, expenditure data have been collected from Budgetary Resources For Education and for rest of the years, i.e. from 1994-95 to 2000-01 data have been collected from different issues of Analysis of Budgeted Expenditure on Education. Data on number of students have separately been collected from Selected Educational Statistics and then arranged to reach the required variable.

The last variable that we have considered is a dummy variable; whose value is one; if the state is small, deserted, hilly and backward and zero; otherwise. Now among the category of hilly areas there are two states, Jammu & Kashmir and Sikkim. We have included the North Eastern states among this category assuming them as backward. In normal life we find many reservations of these North Eastern peoples in almost all the government educational institution. The fact is that they are really backward and have been neglected till now. So these states need to spend more per pupil in elementary level of education. We have excluded Rajasthan due to its formidable size and number of population.

Now let us consider the dependent variable, Per pupil expenditure on elementary education. We have mentioned earlier that per capita expenditure on elementary education signifies the emphasis a state put on the students of that stage of education. Like higher education the data on total expenditure on elementary education on state revenue account has been collected from different issues of Analysis of Budgeted Expenditure on Education and Budgetary Resources for Education. For years 1987-88 to 1993-94, expenditure data have been collected from Budgetary Resources For Education and for the rest of the years, i.e. from 1994-95 to 2000-01 data have been collected from different issues of Analysis of Budgeted Expenditure on Education. As usual, enrolment data have been collected from Selected Educational Statistics.

After we collect all the data some deficiencies were felt. First of all, the expenditure levels were reported without taking into account the fact of inflation. If we don't collect the information regarding inflation, then with inflated values we cannot reach to a definite and real conclusion. Here we dealt with three variables, which has been expressed in monetary terms and needed to be deflated Those three variables are per capita expenditure on higher

education, per capita expenditure on elementary education and per capita net state domestic product. We collected different deflators for all the states calculated by Central Statistical Organization (CSO). Secondly, for Mizoram, values of net state domestic product, for all the fourteen years, were not available in constant price. So it was not possible to calculate the deflator for this state. So, we have taken the average of the deflators of all North Eastern states as deflator of Mizoram. Thirdly, for Sikkim, some enrolment data was missing for three years, so we have taken the average of four years; two consecutively preceding and two consecutively following years.

After gathering all the data and then arranged to get the required variables we were prepared to run the regression. We pooled the data for 14 years and 25 states and ran ordinary least square method. Number of observations is 350 and number of explanatory variables is 6. Actually we ran two regressions. One, in which, we have included all the 25 states and another regression where we have included only 17 large states.

CHAPTER V

Results and conclusions:

After describing all the data and methodology and estimating the model we need to interpret the results of the model. In the first case, we pooled the observations of all the 25 states for 14 consecutive years and ran ordinary least square method of regression analysis, and in another case we included only 17 states. Here Per pupil expenditure on elementary education has been regressed on 7 variables for the first regression and 6 variables for the second regression. The explanatory variables are Per capita net state domestic product (PCNSDP), Per pupil expenditure on higher education (PCEHE), Student per institution (SPI), Pupil teacher ratio (PTR), Proportion of scheduled castes and tribes in total students (PSCST) and two dummy variables D_1 and D_2. D_1 incorporates the hilly, backward states and D_2 incorporates years 1993-94 to 1997-98. We have included D_2 to capture whether per capita higher education have been weak for those above mentioned years. We present our result as follows.

Almost all the variables are significant either in 1 percent or in 5 percent level of significance. According to our prediction coefficient of teacher pupil ratio is negative and showing a high value, this signifies that teacher pupil ratio has a significant and negative impact on Per capita expenditure on elementary education. Teacher's salaries consume a major share of states revenue expenditures, per capita expenditure increases with appointment of a new teacher but increase in total number of students can reduce the cost by a reasonable amount and that is evident from regression result. This result contradicts with results of the paper by Roy, Kamaiah and Rao, 2000. In their paper they found the effect of teacher pupil ratio as insignificant. Per capita net state domestic product also has positive and significant effect on per pupil expenditure on elementary education. This implies that wealthier states spend

more on this stage of education and proves Tilak, 1984, that large resources are a prerequisite for investment into this stage of education.

Table 5.1 – Regression results.

Variable	For all 25 states	For large 17 states
Intercept.	645.67475** (5.33)	616.73900** (6.50)
Per Capita Net State Domestic Product.	0.05954** (9.32)	0.01414* (2.09)
Per Capita Expenditure in Higher Education.	0.01262** (2.61)	0.01645** (3.26)
Student Per Institution	0.64397* (2.28)	1.19587** (4.66)
Proportion of SC & ST in Total Student.	5.08467** (4.04)	17.31884** (9.69)
Teacher Pupil Ratio	-11.95771** (-6.02)	-12.55418** (-7.55)
D_1	551.47392** (8.23)	
D_2	-0.00320 (-0.63)	-0.00076173 (-0.17)
R-square	0.6280	0.5640
Adjusted R-square	0.6204	0.5527
F-value	82.48**	49.81**

** - Significant in 1% level.
* - Significant in 5% level.
D_1=1 if states are small, which include Mizoram, Meghalaya, Manipur, Tripura, Nagaland, Sikkim, Himachal Pradesh, Goa.
D_2=1 if years fall within **1993-94 to 97-98**, D_2 it is a slope dummy but D_1 is intercept dummy

Existence of scheduled caste and tribe students in total elementary level student affects per capita expenditure directly and significantly. As we have mentioned earlier that each and every states are putting their best effort to equalize the education system for all the students, even if they are from backward classes of the society and the result is showing a significant effect. So existence of scheduled caste and scheduled tribe students leads to an increase in per pupil expenditure on elementary education. We have another significant and positive effect of the dummy variable, which was introduced for hilly, backward states where per capita expenditure should be costly and

from econometric analysis we find that our prediction is correct. The expenditure is almost double for these states. Student per institution has a positive effect in the Indian context but the effect is less significant. As we discussed earlier that states' expenditure includes salaries of non-teaching staff, fee exemption, expenditure on sports, expenditure on maintenance of building and furniture, apart from teachers' salaries. We also mentioned that number of non-teaching staff mostly depends on number of institutions and less on number of students but rest of the expenditures depend, basically, on number of students. So, two opposite effects work for the variable Student per institution. On the one hand increase in number of institution raises the expenditure on salaries of non-teaching staff, which is reduced by increase in number of student, on the other hand increase in number of students increases the other costs as well. Hence, a positive and significant effect suggests that other costs of elementary education, apart from teacher and non-teaching staffs' salaries, nullifies the effect of number of students on non-teaching staffs' salaries. The economies of scale effect of number of students on number of non-teaching staff, rather number of institutions, is suppressed by the maintenance cost of building furniture, sports etc. But Per pupil expenditure on higher education has a surprising effect, though the effect is very small; the effect is positive and significant. It is true that proportion of expenditure on higher education has decreased over time but the effect has not been same in all the states. In some states the effect have been seen earlier, whereas in some other states the effect have been see later. So due to this aberrant nature of the states the desired result have not been found. Moreover, though variable D_2 is showing a negative sign, implying that for those years per capita elementary expenditure is attributed to fall in higher education, but the result is not significant. As we have already mentioned that, it may be due to the fact that per capita expenditure on higher education might have not fallen during same time for all the states. At the time of running the regression we introduced literacy rate as a variable but we found insignificant result. Basically

expenditure in elementary education is done to reduce the literacy level, not the other way round. This result contradicted with the result of Roy, Kamaiah and Rao, 2000. They showed that literacy level of the states have a significant effect on expenditure level of each state.

So we found the effects of the variables introduced. For only one variable we found the undesired result, which did not match to our prediction. In India the expenditure on elementary education is improving over time but at a very slow pace. From the results we find that almost all the variables are significant. Among the explanatory variables the dummy variable and the variable on proportion of literacy cannot be changed or determined by the government. But rest of the variables can be. To improve the quality of education governments have to increase the number of teachers, buildings, furniture, non-teaching staffs etc. It is explicitly evident from the above results that pupil teacher ratio is inversely related to per capita expenditure, which means per capita expenditure is bound to rise with increase in number of teachers. And also, per capita expenditure is going to rise with number of students enrolled since student per institution is positively related to per capita expenditure. Per capita expenditure can be checked or reduced by increase in the number of institutions so that SPI falls over time. We also observe that a state with higher per capita net state domestic product is going to invest more on elementary education. But this result has some dire effects. If wealthier states are spending higher than the poor states then over time the literacy gap will increase. Literate states will become more literate over time and illiterate states will become poorly literate over time. So, as a conclusion we can say that India need a lot of improvement in elementary education sector and to make the improvement India need to spend more, at least up to the recommendation of Kothari commission. Otherwise even after 100 years of independence India would yet to accomplish universalisation of elementary education.

Variable-wise Ranks in 2000

	By PCE	By PCE	By PCHE	By PCHE	By SPI	By TPR	By PSCST	By DPCNSDP	By Lit C
1	Sikkim	Sikkim	Jammu & Kashmir	Jammu & Kashmir	Kerala	West Bengal	Mizoram	Goa	Kerala
2	Mizoram	Mizoram	Kerala	Mizoram	Maharastra	Bihar	Nagaland	Punjab	Mizoram
3	Nagaland	Nagaland	Mizoram	Kerala	Tamil Nadu	Addhra Pradesh	Meghalaya	Maharastra	Jammu & Kashmir
4	Himachal Pradesh	Himachal Pradesh	Arunachal Pradesh	Arunachal Pradesh	Tripura	Goa	Arunachal Pradesh	Haryana	Goa
5	Arunachal Pradesh	Manipur	Goa	Goa	Gujarat	Punjab	Tripura	Tamil Nadu	Maharastra
6	Manipur	Arunachal Pradesh	Manipur	Manipur	West Bengal	Tamil Nadu	Punjab	Gujarat	Himachal Pradesh
7	Goa	Goa	Nagaland	Nagaland	Haryana	Haryana	Orissa	Karnataka	Karnataka
8	Kerala	Meghalaya	Meghalaya	Meghalaya	Rajasthan	Rajasthan	Madhya Pradesh	Mizoram	Tamil Nadu
9	Tripura	Kerala	Tamil Nadu	Tamil Nadu	Punjab	Maharastra	Manipur	Himachal Pradesh	Tripura
10	Jammu & Kashmir	Tripura	Orissa	Orissa	Bihar	Gujarat	Himachal Pradesh	Kerala	Gujarat
11	Meghalaya	Jammu & Kashmir	Addhra Pradesh	Maharastra	Karnataka	Kerala	West Bengal	Sikkim	Punjab
12	Assam	Bihar	Maharastra	Addhra Pradesh	Sikkim	Uttar Pradesh	Sikkim	Addhra Pradesh	Sikkim
13	Bihar	Maharastra	Tripura	Tripura	Addhra Pradesh	Karnataka	Assam	West Bengal	West Bengal
14	Maharastra	Tamil Nadu	Sikkim	Sikkim	Goa	Madhya Pradesh	Addhra Pradesh	Arunachal Pradesh	Manipur
15	Tamil Nadu	Assam	Punjab	Punjab	Uttar Pradesh	Orissa	Karnataka	Meghalaya	Haryana
16	Punjab	Gujarat	Haryana	Gujarat	Nagaland	Assam	Maharastra	Tripura	Nagaland
17	Haryana	Punjab	West Bengal	Haryana	Assam	Arunachal Pradesh	Haryana	Nagaland	Assam
18	Gujarat	Haryana	Gujarat	West Bengal	Arunachal Pradesh	Himachal Pradesh	Uttar Pradesh	Rajasthan	Orissa
19	Uttar Pradesh	Karnataka	Madhya Pradesh	Madhya Pradesh	Madhya Pradesh	Jammu & Kashmir	Gujarat	Manipur	Madhya Pradesh
20	Karnataka	Uttar Pradesh	Rajasthan	Bihar	Manipur	Meghalaya	Rajasthan	Jammu & Kashmir	Meghalaya
21	Rajasthan	Rajasthan	Bihar	Rajasthan	Orissa	Tripura	Bihar	Madhya Pradesh	Addhra Pradesh
22	Orissa	Orissa	Himachal Pradesh	Karnataka	Jammu & Kashmir	Nagaland	Tamil Nadu	Assam	Rajasthan
23	Madhya Pradesh	Madhya Pradesh	Karnataka	Himachal Pradesh	Himachal Pradesh	Manipur	Kerala	Uttar Pradesh	Uttar Pradesh
24	Addhra Pradesh	Addhra Pradesh	Uttar Pradesh	Uttar Pradesh	Mizoram	Sikkim	Goa	Orissa	Arunachal Pradesh
25	West Bengal	West Bengal	Assam	Assam	Meghalaya	Mizoram	Jammu & Kashmir	Bihar	Bihar

PCE – Per Capita Expenditure on Elementary Education.
PCE – Deflated Per Capita Expenditure on Elementary Education.
PCHE – Per Capita Expenditure on Higher Education.
D-PCHE – Deflated Per Capita Expenditure on Higher Education.
SPI – Student Per Institution.
TPR – Teacher Pupil Ratio.
PSCST -- Proportion of Scheduled Castes and Scheduled Tribes in Total Students.
DPCNSDP – Deflated Per Capita Nat State Domestic Product.
Lit C – Literacy calculated by Census data.

Bibliography

Abusaleh Shariff, P.K. Ghosh (2000), *Indian education scene and public gap* – Economic and Political Weekly, April 15, pp. 1396-1406.

Allen Roy, B. Kamaiah, M. Govinda Rao (2000), *Educational expenditure of large states: A normative view* – Economic and Political Weekly, April 22, pp. 1465-1469.

Andrew. D. Foster and Mark. K. Rosenweig (1996), *Technical change and human capital returns and investments – evidence from green revolution* – American Economic Review, vol. 86(4), pp. 931-53.

Behrman. Jere R. and Wolfe Barbara L. (1984), *The Socio-Economic impact of schooling in a developing country* – Review of Economic and Statistics, vol. 66, pp. 296-303.

Chris Papageorgiou (2003), *Distinguishing between the effects of primary and post-primary education on economic growth* – Review of Economic Development, vol. 7(4), pp. 622-644.

Development in practice, Primary education in India (1997) – World Bank publication.

J.B.G. Tilak (1984), *Political economy of investment in education in South Asia* – International Journal of Educational Development, vol. 4, No. 2, pp. 155-166.

J.B.G. Tilak (1987), The *Economics of Inequality in Education* – Sage publication, New Delhi.

J.B.G. Tilak (1988), *Cost of education in India* – International Journal of Educational Development, vol. 8, No. 1, pp. 25-42.

J.B.G. Tilak (1997), *Five decades of underinvestment in education* – Economic and Political Weekly, September 6, pp. 2239-2241.

J.B.G. Tilak (1999), *National human development initiative: Education in the Union budget* – Economic and Political Weekly, March 6-13, pp. 614-620.

J.B.G. Tilak (2003), *Financing Education in India* – National institute of Economic Planning and Administration.

J.B.G. Tilak (2004), *Public subsidies in education in India* – Economic and Political Weekly, January 24, pp. 343-359.

Jean Dreaze and Mamta Murthi (2001), *Fertility, Education and Development* – Population and Development Review, vol. 27, pp. 33-66.

Kirit S Parikh and Chiranjib Gupta (2001), *How effective if female literacy in reducing fertility?* – Economic and political Weekly, September 1, pp. 3391-3398.

Maria Jesus Freire-Seren (2001), *Human capital accumulation and Economic growth* – Investigaciones Economiccas, vol. XXV(3), pp. 585-602.

Sharada Weir (1999), *The effects of education on farmer productivity in rural Etheopia* – Working paper S99-7, Center for study of African Economics, Dept. of Economics, University of Oxford.

Simon Appleton (1996), *How does female education affect fertility? A structural model for the Cote D'ivoir* – Oxford Bulletin of Economics and Statistics, vol. 58, pp. 139-66

Stephen P. Heyneman (1980), *Investment in education: uneconomic?* – World Development, vol. 8, pp. 145-163.

V.K. Ramchandran, Vikas Rawal, Mathura Swaminathan (1997) – *Investment gap in primary education: A statewise study*, Economic and Political Weekly, January 4-11, pp. 39-45.

Data Source

Selected Educational Statistics – Department of education, Ministry of Human Resource development, Government of India.

Budgetary Resources for Education – Ministry of Human Resource Development, Department of Education, Government of India.

Analysis of Budgeted Expenditure on Education – Ministry of Human Resource Development, Department of Education, Government of India.

Economic Survey – Ministry of Finance, Economic division, Government of India.

State-wise deflator of Net state domestic product – Central Statistical Organization, Government of India.