

# **Policy Reforms and Financing of Elementary Education in India: A Study of the Quality of Service and Outcome<sup>\*</sup>**

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**Abstract**

*Even as a case can be made out for public spending on elementary education, its link with enrolment rates does not appear strong. However, once efficiency and demand-side factors are accounted for, public spending is seen to make an impact on the rate of enrolment and quality of education as measured by teacher-pupil ratio. Teacher-pupil ratio and the number of schools, in turn, are seen to have a stronger impact on the rate of enrolment in efficient states. Literacy rates as well as state domestic product were seen to have a positive influence on education. The share of public expenditure on elementary education in GDP peaked in 1990-91 but never achieved the targeted level of 6 per cent of GDP. The reforms brought a break in the growth rate of public expenditure on elementary education, from which not all the states could recover even over an extended period of time.*

## I Introduction

Adjustment experiences in several parts of the world have raised concerns that social sector expenditures are vulnerable to cuts during periods of financial constraint. We consider an important sub-sector of the social sector, namely, elementary education, to look at the question of the impact of adjustment on public expenditure and hence on outcome. There are three principal questions in this regard, which in our view are crucially interlinked. First, is there a case for public spending on elementary education? Second, does public spending make an impact on the quality of education and educational outcome, particularly enrolment? Third, what has been the impact of adjustment on public spending on elementary education? The third question gains relevance only if the answer to the first two is in the affirmative.

A rich literature has come up to answer the first question, and the answer seems to be an undisputed yes. There are three principal arguments in support of public spending on education. The first is based on the link between education and economic growth. Crucial factors include the high rates of return to education and large externalities associated with it. The second is the recognition of the public good character of education. The third is the particular historical context of the developing countries. These are discussed in Section II.

The second question gains relevance because of the controversy in the literature as to which aspects of school quality influenced by government policy and expenditure are relevant for determining educational outcomes. Hanushek has reviewed the existing research on schooling to argue that school inputs (such as teacher-pupil ratio, expenditure per pupil, teacher's experience) do not determine schooling outcomes either in developed countries (1986) or in developing countries (1995). While it is admitted that schools do differ in quality, i.e. in their ability to improve student differences (Harbison and Hanushek 1992), these differences are not seen to be highly correlated with measured characteristics of teachers and schools. Moreover, as Kremer (1995) in his comment on Hanushek (1995) notes, most studies

were designed to give a small probability of falsely detecting a significant effect of educational inputs so that chances of obtaining an insignificant effect are large even if the true correlation is positive. Thus, with reference to 12 studies on expenditure per pupil quoted by Hanushek, Kremer notes that assuming a 5 per cent chance of each study yielding a significantly positive result if the true coefficient was zero, the chances of six or more studies out of twelve being significantly positive would be only one in a million. Dearden, Ferri, and Meghir (2002) found that after controlling for ability and family background, pupil-teacher ratio (a measure often used for education quality) does not affect educational qualifications or men's wages though it has an impact on women's wages at the age of 33. Feinstein and James (1999) find that parenting is more important than pupil-teacher ratio for educational attainments. On the other hand, Singh and Santiago (1997) find evidence from Mexico that policy variables, government expenditure, and pupil-teacher ratio are strong determinants of children's attainment of primary schooling. Similarly, controlling for household background variables, Case and Deaton (1999) find strong and significant effects of pupil-teacher ratios on enrolment, educational achievement, and on test scores for numeracy. In the Indian case, Sipahimalani (1999), and Dreze and Kingdon (1999) report that school quality matters a lot in explaining school participation even after controlling for household characteristics. Sipahimalani presents evidence in favour of school quality affecting school participation. Dreze and Kingdon's study shows that child-teacher ratio seems to matter more in the case of the enrolment of girls than that of boys, where it explains initial enrolment (ever been to school) but not current enrolment. In India, most studies tend to concur that mid-day meals have a significant positive influence on school participation and, probably, more so in the case of girls. However, tracing the precise influence of specific aspects of school quality turns out to be a difficult task. According to Dreze and Kingdon, this is partially to be expected, because the crucial school quality variables (e.g. teacher motivation) remain unobserved. Tilak (2002) reports that household expenditure on education is nearly unitary elastic to government expenditure on education, but the effect of pupil-teacher

ratio is not statistically significant. However, other school-related variables such as the availability of school within the habitation and incentives for attending school (mid-day meal, textbooks, uniform) are found to reduce household expenditure considerably and, hence, may affect demand for schooling positively. The question of participation or non-participation in schooling is not examined here.

Our results suggest that wide variation in school participation across Indian states may be because of two factors: the efficiency of public expenditure and the influence of the demand-side factors. Another important feature is the scale of funding with respect to child population and the size of the state. This question is discussed in the Indian context in Sections III, IV, and V. Section III starts by exploring the link between the rate of growth of expenditure and educational outcomes for 16 major states of India. Then, it explores whether public expenditure per child over a period makes an impact on educational outcomes. The results do not show a strong link with enrolment ratios. To explain this, the demand-side factors for enrolment, as shown by the MIMAP-India survey results for the reference year 1994-95, are explored. In Section IV we look at the link between public expenditure and private expenditure by households. Again the link does not turn out to be strong. Based on the discussion in Sections III and IV, we segregate the 32 states and Union Territories in terms of the technical efficiency of expenditure into 16 efficient and 16 inefficient geographical regions (states and Union Territories) and try and explore the link between public spending and educational outcomes. The results suggest a link between public spending and the quality of education, and from there to the rate of enrolment for efficient states. Thus, the efficiency of expenditure and the demand-side factors tend to explain the lack of link between public spending and educational outcomes. It also seems plausible that in efficient states, public activism due to a higher level of awareness results in ensuring greater public spending and also possibly maintaining the higher level of efficiency of expenditure.

The point raised in the third question, too, has seen a growth in literature in terms of the broader issue of impact of adjustment on public spending. Studies of public expenditure patterns and their outcomes across regions, and at times even within regions, have shown vastly differing results. Bourguignon and Morrisson (1992) report that the inter-country picture with respect to social expenditures is more diverse for the African countries, as compared to the Latin American and Asian ones. In Morocco, social expenditure as a percentage of GDP fell in the adjustment years (1983 to 1986), although the share of social expenditure in the total government spending did not decline. In both Indonesia and Malaysia, social expenditures were protected during the reform period. The study presents a confusing picture regarding the impact of reforms on the social sector, because of its choice of the same period for all the three sets of indicators, i.e. expenditure, maintenance of service, and outcome indicators. According to Hicks and Kubisch (1984), the overall picture is that the social sector was comparatively less vulnerable (subject to smaller reduction as compared to that in the total expenditure) to public expenditure reduction in a number of countries during the seventies and the eighties. Social sector expenditure increased in Brazil, Indonesia, and the Philippines during this period, despite cuts in government spending. In the case of Turkey, Guyana, and Sudan, social expenditures were found to be vulnerable. In times of austerity, social sectors, administration, and defence were generally protected, while infrastructure and production sectors were subject to large reductions. Whenever a cut was needed in the social sector, capital expenditure was affected more than recurrent expenditure. But, empirical evidence after the eighties does not support all the findings of Hicks and Kubisch. Taylor (1993) observed that countries affected by shocks adjusted in significantly different ways, depending on both internal and external factors such as institutions, macroeconomic structures, and their socio-economic environments (Bourguignon and Morrisson 1992; Sahn 1987). Therefore, outcomes, including those with respect to expenditure changes (not necessarily cuts), were bound to differ. Moreover, the level of public spending has not always been related to development. This difference is sought to be captured in this

study by looking at the divergent performances of the states within India. We begin by looking at the overall expenditure on elementary education in India in Section VI, and then at the variations across 16 major states of India in Section VII. Section VIII concludes the paper.

## **II. Is there a case for public spending on elementary education?**

In order to answer this question we look at the vast literature on linking education to growth, in recognising the political factors in developing countries that emphasised education at the time of independence, and in establishing the public good character of education.

### *Elementary education and economic growth*

Elementary education is considered an important contributor to economic growth. With the work of Schultz (1961), the investment approach to education gained currency, over-riding Keynes' influence that considered education as consumption good, based on who made the decision to purchase. The instrumental role of education in achieving economic development is now widely acknowledged. Various estimates of rates of return to education suggest that investment in education may be more productive than investment in physical capital, and the rates of return are higher at lower levels of education (Psacharopoulos 1993; Tilak 1987; Blaug *et al.* 1969). The literature indicates that a substantial proportion of the rate of growth of the economies may be attributed to the rise in the educational level of the workforce. The New Growth theories have tried to explain sustained long-run growth by an unceasing accumulation of knowledge based on the argument that investment in human capital is likely to yield constant or increasing returns (Romer 1986; Lucas 1988). This has been held to explain the divergent growth profiles of nations, whereby the less developed economies have failed to catch up with the developed economies. In 1950, a threshold adult literacy rate of 40 per cent was found to be a necessary, though not sufficient, condition for attaining a per capita income above \$200 by Bowman and Anderson (1963). Lau *et al.* (1993) attributed nearly a quarter of Brazil's economic growth during the 1970s to the increase in

the average education of the workforce. Mathur (1993) also found a positive association between stocks of human capital and economic development that was stronger at increasingly higher levels of education. Even in terms of reduction in income inequality, the contribution of primary education is more significant. In agriculture, primary schooling affects productivity positively, especially when technology is changing rapidly (Chaudhri 1979). The level of education in a society (i.e. the proportion of population receiving some education) has also been found to be positively correlated to decline in fertility, improved child health, reduced infant mortality, and greater social and gender equity (World Bank 1997). Education, particularly mass primary education, has been projected as one of the vital ingredients in the success of East Asian economies (World Bank 1993). Therefore, most governments adopt a pro-elementary education strategy in their development plans.

#### *Historical factors*

During their struggle for independence, most of the Third World countries had realised the need for broad-based mass education and were acutely aware of the gap between them and the developed countries. Education was accorded high priority by the governments of the Third World countries and the subsequent explosion in education narrowed the gap considerably. The most impressive increase took place in enrolment in higher education, which grew from less than a million in 1950 to 18 million in 1981, at almost 19.8 per cent per year (Patel 1985).

After independence, the political leadership in India sought to make mass education a basis of the national reconstruction, the aim being a carryover from the objectives of the struggle for independence. Education would not only serve as a vehicle for the economic independence of the individual but would be a harbinger of social change, assuming a special role in breaking economic and caste barriers. The Directive Principles of the Indian Constitution enshrined the objective of free compulsory education for all children till the age of 14, and protective discrimination in favour of the weaker sections of the population. There has been an improvement in literacy rates as well as



other indicators of human development over time, but in comparison with some of the other Asian economies like South Korea, Sri Lanka and China, it fades into insignificance (Table I). But even within India, we find a wide diversity in human development profiles across states. While Kerala's performance is comparable to Asian countries with a high human development record, states like Uttar Pradesh and Bihar show levels of human development comparable to sub-Saharan Africa. This further makes it important to look at the role of the state in improving education.

<b>Table I: Indicators of Human Development, 1997</b>			
Country	Life expectancy at birth (years)	Infant mortality rate (per thousand live births)	Adult literacy rate (per cent)
India	62.4	71	62
Kerala	72.0	12	93
China	69.8	38	83
Korea	72.4	6	97
Thailand	68.8	31	95
Source: Govt. of India (2000).			

Some of the least developed countries today spend as much, if not higher, a share of their GDP and national budgets on social services as the industrialised countries (United Nations 1996). The problem is not just reduction or misallocation in resources across sectors of the economy, but is also one of misallocation within sectors and of the inefficiency of their use. It is in this context that the review of the impact of reforms initiated in India since 1991 on public expenditure on elementary education, and its link with educational quality and outcomes, gains relevance. Differing economic structures and performances prior to adjustment can result in disparate outcomes of reform programmes, social and otherwise, expenditure levels notwithstanding.

*Is education a public good or a private good?*

We have seen the importance of expenditure on education for the growth of the economy and also noted the growing perception that it may be of greater relevance to the developing countries. But in the current atmosphere of growing scrutiny of the nature of state expenditures, we have to consider whether education is to be treated as a public or a private good, and whether expenditure on education is to be treated as consumption or investment. If it is seen as consumption good, that is, private in nature, then the market mechanism may be regarded as the most effective means of ensuring its adequate supply and state expenditure on it must be reduced to increase investment in other areas of greater importance like infrastructure. However, education not only offers private monetary as well as non-monetary benefits to its consumers but also has externalities associated with it, which confer benefits to society at large, even to those who have not had any education. Externalities associated with an average level of human capital affect a worker's productivity as much as the effect of her own human capital (Lucas 1988). Thus, it combines in it the nature of both an investment good and a consumption good (Blaug 1970) and public as well as private good (Musgrave 1959). Apart from its intrinsic importance, education serves certain instrumental roles in ensuring the freedom of a person (Dreze and Sen 1995), which not only guarantees personal gains but also possesses social ramifications including empowering the disadvantaged and reducing inequality.

There are a few practical problems in which the economist has a more direct interest than those relating to the principles on which the expense of the education of children should be divided between the state and the parents (Marshall 1910: 217). The objective of the state in incurring expenditure on education is linked to the macro effects of education over a much longer time horizon, and so is different from that of the individual who is concerned with the immediate returns of education to him and his family over a lifetime. Education can not only ensure economic growth with equity but also has externalities associated

with it, which make the public financing of education imperative (Tilak 1989). The benefits that accrue to the individual in terms of higher earnings are a reason why the individual should pick up a part of the cost. If we look at the state as a supplier of education and the individual as a buyer of it, then investments by both appear to be complementary; and this may be the best model on grounds of equity<sup>1</sup>. Hence, the right balance between public and private expenditures is crucial to the success of any educational policy or programme (Psacharopoulos and Woodhall 1985; Majumdar 1983).

### **III. Public expenditure on elementary education and outcome**

A question often asked with respect to public spending is the rate of growth of expenditure. Assuming that public spending affects educational outcomes with a lag of a couple of years, we try to see whether there is any link between the rate of growth of expenditure during 1991-92 and 1993-94 and the change in educational outcome between 1992 and 1996. Next we look at the influence of average spending per child over the period 1985-86 to 1993-94 on educational outcomes in 1996. Then we include a discussion on the demand side to explain the results.

Table II presents four indicators, namely, enrolment ratio and dropout rate for educational achievements, and pupil-teacher ratio, along with the number of schools per 100 sq. km, for the level and quality of educational services. However, we were unable to find any relationship between the rate of growth of expenditure and the educational achievements of the state during the reforms period. For example, if we compare the rate of growth in expenditure during the period 1991-92 to 1993-94 (given in Table XIII) with the difference in enrolment ratio between 1992 and 1996, we find that Kerala, with a negative growth rate in expenditure, experienced a tremendous increase in enrolment ratio. But Orissa, Gujarat, and Andhra Pradesh, even with a positive rate of

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<sup>1</sup> Milton Friedman (1955) has presented a laissez-faire view of financing education where the primary responsibility of the state is to *enforce contracts, prevent coercion and keep markets free*. There can be three reasons for making an exception: when monopoly or market imperfections exist, where external or neighbourhood effects are important, and thirdly, in favour of those who cannot take responsible decisions like children.

growth in expenditure, experienced a decline in enrolment ratio. Even if we include 1994-95 and 1995-96 on the expenditure side, the story does not change much since Gujarat and Madhya Pradesh show a higher rate of growth in expenditure than Kerala. Similar results are found in the case of dropout. Assam, Gujarat, and Punjab experienced an increase despite a positive rate of growth of expenditure, while Uttar Pradesh and West Bengal experienced a decline despite a negative rate of growth of expenditure. Similarly, when we look at the level of services, we find that Orissa, with a very high rate of growth of expenditure, shows no improvement in the level of services. States like Haryana and Uttar Pradesh, with much lower or even negative rates of growth in expenditure, show substantial improvement.

A variety of reasons may explain the results. One important factor is the demand side, which may have much greater impact on the outcome than the supply side (Pradhan and Roy 2003). Secondly, the efficiency of expenditure may be different across states. Thus, while we concentrate merely on pupil-teacher ratio, what may remain hidden is the quality of teachers themselves. For example, in 1992 Tamil Nadu showed a much better performance than Bihar in terms of enrolment and literacy in rural areas even though Bihar had a higher percentage of qualified primary school teachers and primary schools within habitation. But when we take “*trained* matriculate and above” for teachers, we find the figures to be 26 per cent for Bihar and 51 per cent for Tamil Nadu. Similarly, when we consider that only 30 per cent of the rural primary schools in Bihar had usable blackboards, while the figure for Tamil Nadu was 75 per cent, we find the reason for this apparent paradox (Pal and Pant 1995). Thirdly, indicators like enrolment ratio and dropout rate are also dependent on the rate of growth in population. If the rate is low, even a low rate of growth of expenditure may influence the outcome much more substantially, as seen in the case of Kerala and Tamil Nadu.

<b>Table II: Educational attainment and quality of services</b>								
	Enrolment ratio		Dropout rate		Pupil–Teacher ratio		No. of elementary schools per 100 sq. km.	
	1992	1996	1992	1996	1992	1996	1992	1996
State			*					
Andhra Pradesh	72.8	69.6	75.94	62.82	65	52	20.6	20.6
Assam	81.3	96.3	69.22	70.96	40	36	44.1	47.7
Bihar	60.7	59.0	78.61	79.07	54	48	38.4	38.8
Gujarat	100.8	96.5	58.36	59.39	44	42	16.4	17.1
Haryana	39.9	73.1	35.56	23.91	88	43	14.3	16.5
Himachal Pradesh	85.8	89.0	19.61	15.77	39	31	15.5	15.8
Karnataka	89.1	89.8	61.09	60.96	46	52	21.0	21.6
Kerala	63.8	92.0	2.4	1.96	48	32	25.0	25.0
Madhya Pradesh	89.0	85.0	53.52	44.68	41	41	19.0	22.1
Maharashtra	82.6	100.8	51.21	47.38	49	39	20.0	20.5
Orissa	88.8	77.3	69.24	61.21	35	35	34.0	34.8
Punjab	64.1	74.2	45.37	46.44	55	37	27.6	30.1
Rajasthan	67.2	81.0	81.88	64.77	47	40	11.9	13.6
Tamil Nadu	95.3	100.6	38.85	34.74	57	47	27.5	27.8
Uttar Pradesh	69.4	65.1	48.39	37.93	60	53	32.0	37.7
West Bengal	124.3	97.9	74.29	46.67	76	70	62.0	61.0
Total	80.1	80.8			52	46	24.2	25.8
All India	79.0	80.7	61.1	52.74	51	45	22.1	23.6
Source: Calculated from Govt. of India, 1993, and 1997b.								
* Govt. of India, 1998b.								

Keeping in mind the above factors, a more relevant analysis may be to relate the final outcome in 1996 to expenditures incurred by state governments per child in the few years prior to that. The results have been presented in Table III. Even here we do not find a very high correlation between enrolment rate and public expenditure per child. Again, the demand side and the efficiency of expenditure become important variables that would help the transformation of expenditure into a better outcome. The correlation with dropout rate is higher, suggesting that public expenditure has a much higher impact on retaining children at school rather than bringing about greater enrolment. The impact on pupil-teacher ratio is the highest. The negative value is to be expected, because pupil-teacher ratio shows the number of students per teacher that would be expected to decline with greater expenditure. Thus, public expenditure has a higher impact on improving the quality of services. However, so far as infrastructure in terms of the number of schools per 100 sq. km is concerned, we find a small but negative correlation with expenditure. This is much more difficult to explain, but it may be argued that the link is reverse; the states with limited educational infrastructure are spending more in order to overcome the limitations of infrastructure, to catch up with the more advanced states. Or due to political reasons, in some states there may be greater emphasis on generating employment by increasing the number of teachers, while less funds are available for building schools.

<b>Table III: Correlation between per child expenditure and educational attainment</b>					
State	Average expenditure per child 1985-86 to 1993-94*	Enrolment 1996	Dropout rate 1996	Pupil - Teacher ratio 1996	No. of elementary schools per 100 sq. km. 1996
Andhra Pradesh	128.8	69.6	62.82	52	20.6
Assam	205.8	96.3	70.96	36	47.7

Bihar	137.4	59.0	79.07	48	38.8
Gujarat	215.6	96.5	59.39	42	17.1
Haryana	149.7	73.1	23.91	43	16.5
Himachal Pradesh	360.8	89.0	15.77	31	15.8
Karnataka	182.1	89.8	60.96	52	21.6
Kerala	303.4	92.0	1.96	32	25.0
Madhya Pradesh	137.5	85.0	44.68	41	22.1
Maharashtra	186.0	100.8	47.38	39	20.5
Orissa	157.0	77.3	61.21	35	34.8
Punjab	161.5	74.2	46.44	37	30.1
Rajasthan	149.2	81.0	64.77	40	13.6
Tamil Nadu	213.5	100.6	34.74	47	27.8
Uttar Pradesh	117.8	65.1	37.93	53	37.7
West Bengal	114.4	97.9	46.67	70	61.0
Total	156.8	80.8		46	25.8
All India	165.0	80.7	52.74	45	23.6
<b>Correlation</b>		<b>0.46</b> <b>(10%)</b>	<b>-0.58</b> <b>(2%)</b>	<b>-0.63</b> <b>(1%)</b>	<b>-0.34</b>

Source: Government of India, 1993 and 1997a.

\* Government of India, 1995: Average expenditure for 1985-86 to 1993-94 has been divided by child population in 1991.

Thus, merely public expenditure on education does not explain differences across states in educational achievements. While it does tend to explain the differences in the quality of education to some extent, it does not explain the educational achievements to the same extent. There is a need to look at the demand side and to analyse whether public and private expenditures on education are complementary. Also, an important feature of state financing is the proportion of spending that goes to elementary education.

Given these factors, along with the above analysis, which shows that there is more to educational attainment than merely a public supply of education, it is necessary to look at the causes of non-enrolment as investigated by the MIMAP-India Survey (Pradhan and Roy 2003). In the case of rural areas, the household response (Figure I) shows that the major reasons for non-enrolment are unconstrained demand (interest-related factors being 51 per cent) and constrained demand (economic factors accounting for 39 per cent). The NSSO results of the 35th round for 1980-81 also confirmed these two as important factors in non-enrolment. This re-establishes that demand reasons, and more so the interest-related factors rather than economic factors, are more important than other reasons in explaining non-enrolment and dropouts in India. Supply-related factors such as “school too far”, “school dysfunctional”, and “teacher’s attitude discouraging”, account for only 2 per cent. Similarly, custom- and health-related factors each account for only 4 per cent. As compared to the above-poverty-line group (48 per cent), a larger percentage (52 per cent) of the population in the below-poverty-line category (Figures II and III) attribute their non-enrolment to unconstrained demand (interest-related factors). However, constrained demand is the next prominent reason of non-enrolment for both above-poverty-line and below-poverty-line categories of population, although the degree is less for the former (38 per cent) than the latter (40 per cent). The state has to deal with the interest-related factors in more innovative ways; merely an increase in state funding may not be enough. This seems to be one of the primary reasons why we do not find a close link between state expenditure and educational attainment. Hence, in rural areas, the major reason for non-enrolment is unconstrained demand, which negates the popular perception that poverty or financial constraint is the major factor for poor households.

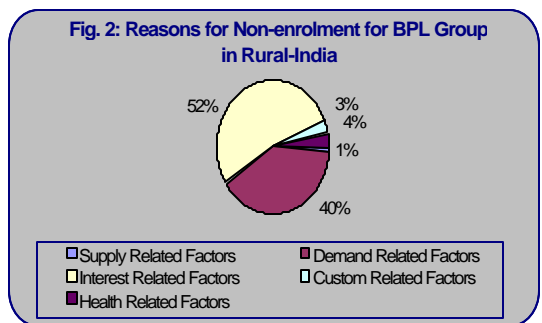
In urban areas, however, constrained demand (52 per cent) is the major reason for non-enrolment (Figure IV). But, a contrast is observed between the poor and non-poor in urban areas. While constrained demand (57 per cent) is the major reason for the non-enrolment of the poor (Figure V), unconstrained demand (45 per cent) is the major reason



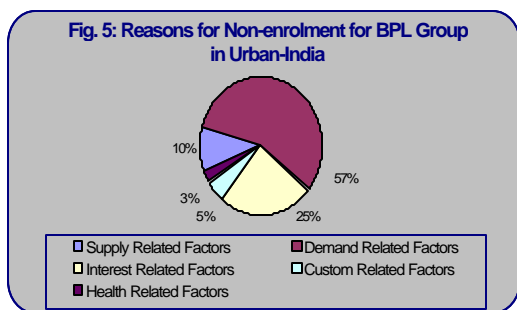
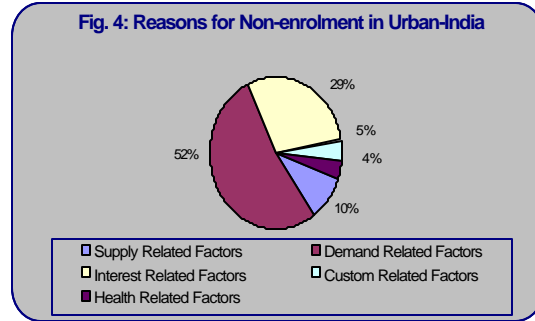
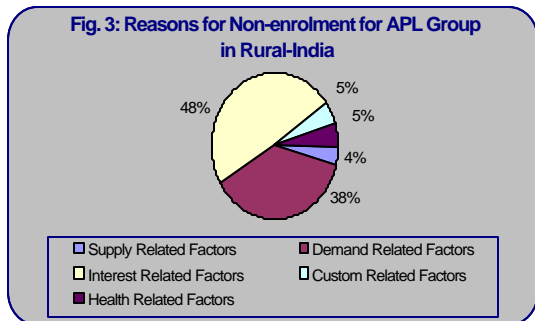
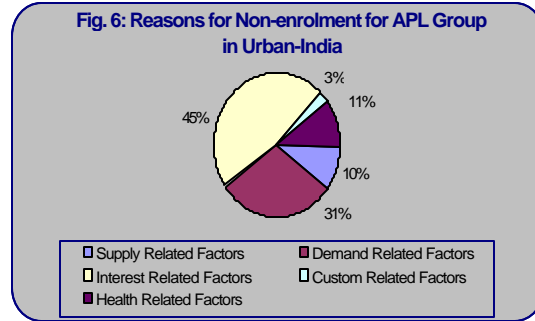
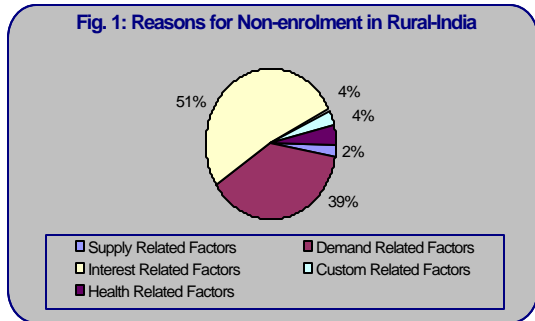
for the non-enrolment of the non-poor (Figure VI). Thus, based on the above data, among the reasons for the non-enrolment of various groups of population on the basis of places of residence and the level of poverty, the primacy of demand factors (either unconstrained or constrained) is established beyond any doubt. On the contrary, supply-, custom- and health-related factors, which are no doubt important, rank lower as reasons of non-enrolment as stated by the respondents of the MIMAP-India Survey.

In this context, it is important to note that most studies for India have estimated the returns to primary education to be low (Kingdon 1999). The returns to education are generally seen to go up with the level of education, contrary to the conventional worldwide pattern. As Kingdon notes, this seems to be consistent with the suggestion that over time the rates of return to primary education may have collapsed in many countries. This may explain the low interest in acquiring education. Pradhan and Subramanian examine the role of returns to education in the household decision-making process on school participation in a modelling framework by explicitly taking “the lack of interest” as a proxy for returns to education. They also find that even after controlling for household variables, wage rates remain significant in explaining school participation. Another important conclusion from their study is that education-based welfare programmes not only have significant impact on the decision to send children to school, but also improve the performance of the expected returns to education.

The importance of demand-side factors does not imply that the state has no role to play in expanding the educational base. What it implies is that government spending on education has to be accompanied by other programmes to address non-monetary constraints that individuals face in their decision to attend school (Inchauste 2000). Public expenditure has to be directed towards inducing the demand for elementary education. For example, education-based welfare programmes such as mid-day meals and improvements in the quality of



schools may be demand-inducing. The link between education and employment opportunities has to be made stronger and needs to be clearly perceived by the population. Besides, custom- and health-related factors might also be a cause of lack of interest that can be taken care of by the state. In the case of the poor, the state can also bring about a change by easing the economic constraints, particularly in the urban areas.



#### IV. The role of private expenditure on education

At this stage, it may also be worthwhile to examine the link between public expenditure and private expenditure on elementary education. Does higher spending by the government bring forth higher spending by the households? The correlation between the two turns out to be very small, suggesting no link between public and private expenditure on

elementary education across states (Table IV). However, we may note that household expenditure on elementary education is very high, contrary to the popular perception that education is mostly free in India. Even households in rural areas belonging to the lower socio-economic group spend considerable amount on books, uniform and fees (including examination and other fees) (Tilak 2002). This, coupled with low rates of return to lower levels of education, suggests why there is a lack of interest in acquiring education. The positive response to welfare programmes such as mid-day meals, noted by a number of studies, suggests that government spending in these areas is likely to induce demand for education and increase enrolments.

Taking a log of both the variables and then regressing private household expenditure (primary) per student on public expenditure (elementary) per child, we find a strong and statistically significant positive relationship between the two [Table IV, regression (1)]. This is similar to Tilak's (2002) observation that there is nearly unitary elasticity between government and private household expenditure, suggesting complementarity between the two. It must be noted that the exercises conducted in these two studies are different because the variables considered are very different. One, Tilak takes the average household expenditure per student on elementary education, calculated from HDI survey data for rural households. We take the average household expenditure per primary class student taken from the NSSO survey. The advantage of using the NSSO survey is that the sample size is very large and includes urban and rural population. However, it does not provide the average expenditure of households on elementary school students. Second, public expenditure in our case is per child in order to reflect the scale of funding for the state, whereas Tilak has taken public expenditure per student. Also, Tilak relates household expenditure in rural areas to the total state expenditure per student. Rural households are much more dependent on state education facilities, and so may be affected much more by state expenditure than urban households. The conclusions, however, are not very different. The ideal method for looking at substitutability or complementarity between government and

private expenditure on education would be to do a time series analysis. The results could be substantially different for different states over time. However, the paucity of data with respect to household expenditure on education does not allow this. An interesting feature is that elasticity with respect to per capita state domestic product, which may be taken as a proxy for household incomes, comes out to be lower than that for public expenditure, though more significant [Table IV, regression (2)]. Tilak too reports a very low elasticity of household expenditure on education in general, and elementary education to household incomes. Thus, if government expenditure on elementary education is reduced, the result may be a decline in household expenditure, affecting enrolments negatively.

Reflecting the highly significant relationship we found between the log of per capita state domestic product and private expenditure per student, a much higher level of correlation is observed between these two than with public expenditure (Table V). This suggests that economic factors do play a role in higher demand for education. Again, comparing with the results obtained by Tilak, the link is clearly in the same direction. It has to be noted that state domestic per capita is not merely an indicator of household income. It is likely to be related to the level of development of the state, measured by such factors as the share of industry in total employment and state domestic product (SDP). Thus, the relationship between household expenditure and SDP per capita may also be indirect, through the perception of increased opportunity to exploit the employment potential.

<b>Table IV: Ranking of states in descending order by expenditure per child</b>			
States ranked by public expenditure per child on elementary education	Public expenditure per child (average for 1993-94 to 1995-96)*	States ranked by private expenditure per student on primary education	Private expenditure per student (1995-96)**

Himachal Pradesh	1344	Punjab	1162
Kerala	1209	Haryana	953
Gujarat	917	Kerala	725
Assam	871	Himachal Pradesh	573
Tamil Nadu	846	Maharashtra	540
Rajasthan	701	Rajasthan	518
Karnataka	701	Uttar Pradesh	507
Maharashtra	697	Tamil Nadu	464
Orissa	654	West Bengal	433
Haryana	605	Andhra Pradesh	430
Madhya Pradesh	557	Gujarat	423
Punjab	545	Madhya Pradesh	333
Bihar	474	Bihar	330
Andhra Pradesh	446	Karnataka	294
Uttar Pradesh	431	Orissa	284
West Bengal	376	Assam	251
Simple correlation between public and private expenditure = 0.06			
Regression:			
(1) $\ln(\text{priexp}) = b_1 \ln(\text{govexp})$		(2) $\ln(\text{priexp}) = b_2 \ln(\text{income})$	
Elasticity coefficient( $b_1$ ) = 0.943 (t -value = 46.749)		Elasticity coefficient( $b_2$ ) = 0.678 (t -value = 74.241)	
Adj R-squared = 0.9927		Adj R-squared = 0.9971	
Source: * Govt. of India, 1993 & 1998a (Average public expenditure for the period has been divided by the estimated child population in Sep., 1993). ** NSSO, 1998.			

Education constraints may be divided into resources, values, incentives, and institutions (Dreze & Saran 1993). A higher level of general education in a state is likely to strengthen the institutional mechanism to demand more resources and better education from the state, thus creating a positive impact on all the above factors mentioned by Dreze and Saran. The correlation between the literacy rate in 1991 and public expenditure per child comes out to be fairly high (Table V).

Private expenditure on education, too, is positively associated with the literacy rate in 1991, suggesting that a higher level of education has a positive influence on the demand side, possibly by reinforcing the positive attitude towards education. The quality of education, too, influences demand positively.

<b>Table V: Factors explaining higher private expenditure</b>		
State	Per capita net state domestic product at current prices 1995-95**	Literacy rate 1991**
Andhra Pradesh	9274	44.09
Assam	6624	52.89
Bihar	3533	38.48
Gujarat	12914	61.29
Haryana	13573	55.85
Himachal Pradesh	8747	63.86
Karnataka	9359	56.04
Kerala	9004	89.81
Madhya Pradesh	6775	44.2
Maharashtra	15770	64.87
Orissa	6236	49.09
Punjab	16053	58.51
Rajasthan	7523	38.55
Tamil Nadu	10222	62.66
Uttar Pradesh	5872	41.6
West Bengal	8491	57.7
Correlation with average private expenditure per student (primary)*	0.67	0.36

Correlation with average public expenditure per child (elementary)*	0.10	0.68
Source: * Same as table 4 above ** Economic Survey, 1999-2000.		

## V. Technical efficiency of elementary education across states

Having seen that the efficiency of expenditure can be an important factor in explaining the divergent performances of states in terms of enrolment and dropout, this section considers the technical efficiency of states based on two inputs: schools, as a measure of the capacity, and the number of teachers. The efficiency of factor inputs in generating educational output (such as enrolment and dropout) can be low due to a variety of factors. One of the problems can be the need to reach out to a larger population over a wider geographical region. Inefficiency would come due to decreasing returns to scale. Hence, factor productivity would appear to go down. The other can be inefficiency, because factor inputs that should be measured by technical efficiency are not being utilised properly. It must be noted here that this technical efficiency can come also due to a lack of certain complementary inputs or because the quality of inputs is bad, which may not have been accounted for. For example, schools may not have roofs or blackboards; in certain areas there might be teachers but schools may not have been built; and the teachers may not be trained and hence may not be good. There is evidence that these reasons are important in the Indian context. The PROBE (1999) survey, for instance, found the following with respect to government schools: (a) only a fourth of the sample schools had at least two teachers, two all-weather classrooms, and some teaching aids; (b) at the time of the investigator's visit, one-third of the headmasters were absent, one-third of the schools had a single teacher present, and about half of the schools had no teaching activity; (c) in many schools class I students were systematically neglected. These represent serious flaws in the schooling process. If teachers are absent from schools or do not teach, the overall teacher-pupil ratio would not be of any meaning.

Similarly, since education is a cumulative process, a systematic neglect of education at the early stage implies that students' current level of achievement as well as interest in schooling would decline.

It is difficult to account for all the factors that go into educational output, due to lack of data. Hence, the results presented here can be only taken to be indicative and not conclusive. The ranking is expected to be due to the aggregate effect of all the factors mentioned above and more. However, it is precisely these effects that we are not able to trace when we deal with aggregate data across states. So the conclusion that with the same level of inputs some states would do better is important.

The method adopted was input-oriented Data Envelopment Analysis (DEA) with variable returns to scale. DEA makes no assumption about production function and hence is more appropriate for studying the efficiency of conversion of inputs into outputs with respect to education, because no good estimate of appropriate frontier for education is available (Harbison and Hanushek 1992). It measures efficiency by ranking the "producers" from within the sample in order to establish the production frontier based on certain very unrestrictive assumptions such as convex production frontier. A parametric approach based on the assumption of a functional form of the production function can be considered doubtful, given the small sample. DEA also is better than Free Disposable Hull (FDH) analysis, used by Gupta, Honjo, and Verhoeven (1997), and Clements (1999), because the latter, with no restrictions on the shape of the frontier, can identify very small observations as inefficient. In the case of multiple inputs and outputs, FDH is even more limited.

Table VI ranks the states in terms of technical efficiency with variable returns to scale and then by scale efficiency. West Bengal and Delhi turn out to be the most efficient. Maharashtra and Uttar Pradesh, both large states, turn out to have the problem of scale inefficiency. Thus, the size of the state matters, because a larger area, particularly rural, would imply spreading the resources thin, resulting in decreasing



returns to scale. The usage of inputs, therefore, would also show inefficiency, because reaching the last child involves a much larger increase in input than may be shown by the performance of states with relatively low enrolment levels. Kerala and Himachal Pradesh are ranked among relatively inefficient states, but that is primarily because the inputs by the states are very high, which has helped in creating very high levels of enrolments in these states<sup>2</sup>. But the interesting feature is that most of the states are in the region of increasing returns to scale, implying that they can expand enrolments faster if they increase the inputs.

Having so distinguished the states by the level of technical efficiency, we test the hypothesis that the relatively efficient states would show a stronger link between enrolment and public expenditure. One of the channels through which this would work is the impact of public expenditure on the quality of education, and hence outcome. As can be seen from Table VII, public expenditure per child does determine the rate of enrolment across states. The coefficient for the efficient states is higher than for the inefficient states, suggesting that it makes greater impact on enrolment depending upon the efficiency of expenditure. However, it explains less of the variation in rates of enrolment across efficient states than the inefficient states, as seen from a lower value of adj-R<sup>2</sup>. The reason becomes clear from the next regression, where we include the household annual expenditure per student. They together explain a higher amount of variation in enrolment across efficient states than inefficient states. The household expenditure term is insignificant for inefficient states, while both public expenditure and private expenditure turn out to be significant in explaining enrolment in efficient states. The coefficients are also higher for the efficient states. This suggests that where public expenditure is efficient, private expenditure tends to complement it in increasing the educational outcome.

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<sup>2</sup> These states have extremely low dropout rates (see Table II). Hence, if we account for dropout rates and look at retention rates, these states will turn out as relatively efficient. On the other hand, a state like Bihar, with the highest dropout rate, would move down in the rankings. These states may be considered as outliers.

**Table VI: Ranking of states by technical efficiency (constant returns)**

State	Crste	Vrste	Scale	
West Bengal	1	1	1	
Delhi	0.92	0.943	0.976	irs
Uttar Pradesh	0.619	1	0.619	drs
Madhya Pradesh	0.615	0.615	1	
Andhra Pradesh	0.611	0.612	0.999	irs
Punjab	0.532	0.538	0.988	irs
Maharashtra	0.507	0.606	0.836	drs
Karnataka	0.495	0.496	0.998	irs
Haryana	0.478	0.484	0.987	irs
Bihar	0.476	0.476	0.999	
Orissa	0.463	0.466	0.994	irs
Rajasthan	0.462	0.463	0.998	irs
Tamil Nadu	0.459	0.46	0.999	irs
Assam	0.431	0.434	0.994	irs
Gujarat	0.389	0.39	0.997	irs
Tripura	0.346	0.374	0.925	irs
Pondicherry	0.321	0.41	0.783	irs
Daman & Diu	0.313	1	0.313	irs
J&K	0.31	0.32	0.968	irs
D&N Haveli	0.309	0.819	0.377	irs
Goa	0.303	0.372	0.815	irs
Himachal Pradesh	0.295	0.307	0.962	irs
Kerala	0.293	0.296	0.993	irs
Chandigarh	0.289	0.432	0.668	irs
Meghalaya	0.278	0.312	0.892	irs
Manipur	0.223	0.254	0.88	irs
Nagaland	0.216	0.245	0.879	irs
Arunachal Pradesh	0.204	0.253	0.804	irs
Mizoram	0.191	0.244	0.783	irs
Sikkim	0.187	0.27	0.693	irs
A & N	0.156	0.269	0.581	irs

Lakshadweep	0.137	0.678	0.202	irs
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Source: Calculated on the basis of data provided in Government of India, 1997a.

Note: crste = technical efficiency from CRS (Constant Returns to Scale)

DEA

vrste = technical efficiency from VRS (Variable Returns to Scale)

DEA

scale = scale efficiency = crste/vrste

irs = increasing returns to scale

drs = decreasing returns to scale

Looking at the impact of public expenditure per child on the quality of education, as measured by the number of teachers per 1,000 students, we find that the impact is insignificant in inefficient states and significant in efficient states. The small value of the coefficients is to be expected, because we are dealing with the ratios of very large numbers. Thus, whether or not public expenditure affects the quality of education depends on the efficiency of utilisation of public funds and hence, so does the impact of this expenditure on educational outcome. The next stage is to look at whether the quality of education makes an impact on the rate of enrolment or not. As can be seen from the regression results presented in Table VIII, teacher–pupil ratio and the number of schools per sq. km are significant in explaining the rate of enrolment in efficient states but both the variables are completely insignificant in the case of inefficient states. The high value of the constant term, along with the fact that it remains significant in both the cases, may be taken to reflect the importance of demand-side factors. If we rank efficiency based on variable returns to scale, it turns out that in the case of efficient states teacher–pupil ratio becomes the most significant and the constant term becomes insignificant. The value of adj-R<sup>2</sup> also improves. However, in the case of inefficient states, the results do not change much. It may be argued that enrolment depends to a great extent on the demand-side factors, but the quality of education and infrastructure, which can be influenced by government policy and expenditure, can increase the rate of enrolment and can even push demand for education.

We further look at what determines private and public expenditures. The link would come from, one, a higher capacity to spend, resulting in greater spending on education, and two, greater awareness because of a high level of educational attainment in a geographical region, resulting in greater spending. A higher level of awareness would imply that public activism could result in greater expenditure by the government on education, and also greater efficiency in expenditure. It could also motivate the people to spend more on education if they have the capacity to do so. The capacity to spend would depend on the income levels of the households, which may be proxied for by the per capita income of the state. However, a higher per capita income would imply that the people can afford to pay for education and hence the state would have less pressure to spend. We regress public and private expenditure on the literacy rate (proxy for the level of awareness) and per capita income (proxy for capacity to pay) (Table IX). There is a problem here concerning the availability of data on per capita income with respect to inefficient states, including Union Territories. Hence, the number of observations is less. The results vary across efficient and inefficient states. Overall, literacy only seems to be significant (at 5 per cent) in explaining the variations across states in public expenditure on elementary education per child. In efficient states, literacy puts greater pressure on state governments to spend more on elementary education. Private expenditure is related negatively to literacy, suggesting that more informed population groups pressurise the government to spend more, and they spend less. The sign with respect to literacy is negative for private expenditure, but it is not significant in explaining this expenditure. On the other hand, per capita income has the reverse effect. Greater capacity to pay on the part of the people leads to greater expenditure on education, and the government releases itself of the burden. In inefficient states, literacy and per capita income both tend to have a negative effect on private expenditure, while per capita income has a positive effect on public expenditure. Both literacy and per capita income are insignificant in explaining private expenditure. The link is likely to be through the quality of education. Since the quality of

education is bad, there might be a satisfaction with relatively a small amount of education so that population groups with some educational attainment do not put pressure on the government to increase expenditure. They themselves would not be interested in spending on education, because they do not perceive adequate benefits from it.

It may also be noted here that merely looking at pupil-teacher ratio and its impact on school participation or attainment is not enough. Part of the reason that pupil-teacher ratios do not seem to affect schooling is that variations in pupil-teacher ratios, in general, are small. The issue is also related to what the case would be if the demand for schooling increases and also over time the absolute number of children getting enrolled increases. There is hence a need to increase expenditure on elementary education in order to meet the demand that may grow from two sides: (1) an increase in the rate of enrolment, and (2) to keep up with the rise in child population and hence an increase in absolute numbers seeking education at the same level of rate of enrolment.

<b>Table VII: Expenditure as a determinant of rate of enrolment and quality of education</b>			
Independent variables	Dependent variable		
	1. Rate of enrolment (1996)	2. Rate of enrolment (1996)	3. Teachers-per-1000-pupil
Constant	67.85 (9.26)	59.79 (6.26)	18.30 (6.82)
Public expenditure per child (average for 1993-94 to 1995-96) (pub exppe)	0.0328 (8.72)	0.0326 (8.77)	.0043 (3.11)

Average annual expenditure per student in primary school in 1995-96 (households) (average)	-	0.010 (1.29)	-
$\bar{R}^2$ (N=32)	0.7075	0.7139	0.2187
Efficient states			
Constant	60.51 (5.31)	45.05 (3.99)	12.11 (3.87)
Pub exppe	0.0416 (2.49)	0.05 (3.47)	.0126 (2.75)
Average	--	0.017 (2.60)	-
$\bar{R}^2$ (N=16)	0.2581	0.4737	0.3038
Inefficient states			
Constant	76.80 (3.68)	69.06 (1.93)	
Pub exppe	0.0298 (3.81)	0.031 (3.38)	.0026 (0.899)
Average	--	0.005 (0.27)	--
$\bar{R}^2$ (N=16)	0.4734	0.4360	-0.0129

Note: Figures in parenthesis show the t-statistics.

<b>Table VIII: The impact of quality variables on the rate of enrolment</b>		
Independent variables	Dependent variable: Rate of enrolment (1996)	
Constant	73.16 (2.905)	
Teachers-per-1000-pupil	1.67 (2.065)	
Number of schools per sq. km.	0.11 (0.456)	
$\bar{R}^2$ (N=32)	0.0687	
Efficient states	Based on crste	Based on vrste
Constant	54.62 (3.246)	23.63 (0.881)
Teachers-per-1000-pupils	1.25 (1.578)	2.94 (2.247)
Number of Schools per sq. km.	0.19 (2.044)	0.28 (1.807)
$\bar{R}^2$ (N=16)	0.2412	0.3534

Inefficient states		
Constant	160.19 (3.459)	153.379 (3.132)
Teachers-per-1000-pupils	-0.155 (-0.131)	-0.104 (-0.082)
Number of schools per sq. km.	-0.196 (-0.388)	-0.361 (-0.584)
$\bar{R}^2$ (N=16)	-0.1402	-0.1188

Note: Figures in parenthesis show the t-statistics..

<b>Table IX: The determinants of public and private expenditure on elementary education</b>		
Independent variables	Dependent variable:	
	Pub exppe	Average
Constant	-74.65 (0.075)	-76.42 (0.24)
Literacy (1991)	24.37 (1.288)	3.19 (0.527)
Per capita income (1995-96)	0.004 (0.067)	0.056 (2.971)
$\bar{R}^2$ (N=27)	0.0116	0.3167
Efficient states		
Constant	-143.88 (0.504)	-120.07 (0.238)
Literacy (1991)	22.25 (3.169)	-3.37 (0.272)
Per capita income (1995-96)	-0.041 (2.737)	0.092 (3.465)
$\bar{R}^2$ (N=16)	0.3561	0.6088
Inefficient states		
Constant	2862.933 (1.928)	1068.55 (2.264)
Literacy (1991)	-29.899 (1.439)	-1.88 (0.285)
Per capita income (1995-96)	0.154 (1.803)	-0.015 (0.551)
$\bar{R}^2$ (N=11)	0.1907	0.1789

Note: Figures in parenthesis show the t-statistics..

## VI. Public expenditure on education in India

The sources of finance for education in India are the central and the state governments, local bodies, consumers of education (fees, etc.), and foreign aid. Primary among these is the source of state governments. However, the role of the central government is crucial because its expenditure is of strategic importance. It not only expands existing programmes, but also funds new programmes and initiatives.

The share of expenditure on education in GDP increased from 1.19 per cent in 1951 (not given in the table) to 2.78 per cent in 1975-76 (Table X), i.e. more than double the share. It peaked at 3.87 per cent in 1990-91, after which it suffered a decline, from which it never recovered till 1998-99, and it even fell below the levels achieved in the eighties. The target of 6 per cent of GDP (Government of India 1968) was never achieved. Elementary education was always accorded the highest priority in government budgets, but could never reach 50 per cent of the total central and state government budgets on education (revenue account).

The target of free and compulsory education for all below 14 years of age—set in 1950, the target was to be attained by 1960—is yet to be fulfilled till date. Although there has been progress, the current levels of elementary enrolment continue to be low (Table XI). The fact that the enrolment rates are lower for the below-poverty-line (BPL) households as against the above-poverty-line (APL) households, and that they are lower for rural areas as compared to urban areas, lays further emphasis on the role of the state. The state needs to take care of the special problems that the vulnerable groups may face to improve the educational status of the population. Of special concern here is the status of women, particularly so because their education has the most crucial effect on the health and education of children. As can be seen from Table XI, their position is worse in the case of the BPL group and in rural areas.

<b>Table X: Trends in expenditure on education</b>		
<b>Year</b>	<b>Educational expenditure as</b>	<b>Percentage allocation of total (Centre+state) budget</b>



	<b>percentage of GDP - All India</b>	<b>to elementary education</b>
1975-76	2.78	46.2
1980-81	2.96	45.5
1985-86	3.53	46.2
1990-91	3.87	46.3
1991-92	3.72	46.3
1992-93	3.67	45.2
1993-94	3.52	46.2
1994-95	3.50	46.4
1995-96	3.46	48.3
1996-97	3.46	49.1
1997-98	3.53	49.6
1998-99	3.90	49.1
1999- 2000	4.07	48.1
Source: Government of India, 2003.		

A study by the Institute of Applied Manpower Research (IAMR) of the level of educational deprivation for 1991 and 1996 in sixteen major states has considered financial allocation as one of the major variables in measuring the educational status of the states (IAMR 1999). The study concludes that per capita allocations were low for the states with higher deprivation values and high for the states with lower deprivation values and that a substantial increase is necessary to reduce deprivation levels. Since a greater part of the spending effort is undertaken by the states, their expenditure patterns need to be reviewed. This needs to be complemented by the pattern of household spending. Since education expenditure on the capital account is very small, the expenditure on the revenue account alone has been considered.

**Table XI**  
**Elementary enrolment rates (%) and gender disparity**  
**by place of residence and poverty category**

<b>Place of Residence</b>	<b>Persons</b>	<b>f/m</b>
All-India	76.2	0.90
BPL	65.6	0.82
APL	84.8	0.95
Rural-India	73.2	0.88
BPL	63.8	0.81
APL	81.1	0.93
Urban-India	86.7	0.94
BPL	72.4	0.85
API.	96.4	0.99

Source: Pradhan and Roy, 2003.

## VII. The variations across states

While most states show a marked increase in revenue expenditure on elementary education in the period immediately preceding the reforms, Uttar Pradesh and Orissa show the highest increase with almost a doubling of expenditure (Table XII). Expenditure on elementary education was hit hardest in 1991-92, when ten out of the sixteen major states we have considered showed a negative growth rate. It picked up slowly after that, but not all. The states that have been of greatest concern like Uttar Pradesh, Bihar and West Bengal in fact suffered a decline even in absolute amount when we compare the 1990-91 figures with the 1995-96 figures. Andhra Pradesh and Punjab increased the expenditure only marginally. If we look at the figures for all the states and UTs, then too we find much higher annual growth rates for the pre-reforms period than for the reforms period (Table XIII). However, for the sixteen major states considered here, a higher annual rate of growth is observed for the entire reforms period from 1990-91 to 1999-00. This has been due to the exceptional performance of four states—Assam, Gujarat, Maharashtra, and Kerala. If we ignore the one exceptional year of 1987-88, the same result does not hold for the expenditure incurred by the Centre. This was the year when the National Policy on Education was brought within the budget provisions and so we find nearly a 500

per cent increase in expenditure. Barring this exception, the Centre's contribution to elementary education seems to have increased steadily in the reforms period. But such stability is not found in the contributions made by the states. West Bengal shows a negative growth rate for the period 1990-91 to 1995-96 and a small 2 per cent rate of growth for the entire reforms period. For the ten-year period from 1985-86 to 1995-96, Andhra Pradesh, Bihar and West Bengal have shown the greatest instability in expenditure, in that comparatively there were many years in which there was a negative growth rate (not shown in the table). In the case of West Bengal, as already noted above, it was entirely concentrated in the reforms period.

Comparing the average annual growth rates for the pre-reforms and the reforms periods (Table XIII), we generally find a sharp decline in the rate of growth of revenue expenditure on elementary education in the period immediately following the introduction of reforms (viz. 1991-92 to 1993-94). That tends to get corrected when we consider a longer period in the reforms period up to 1995-96. The exceptions are Gujarat, which shows a continuous increase, and Karnataka, which shows an increase in the initial period of reforms and a subsequent decline (can be seen from Table XII). Maharashtra, Gujarat, and Assam managed to overcome the initial shock of reforms and the rates of growth from 1991-92 to 1995-96 turn out to be higher than from 1985-86 to 1990-91. On the other hand, Andhra Pradesh, Himachal Pradesh, Karnataka, and Punjab have shown a lower rate of growth for the period 1990-91 to 1995-96 than in the initial years of reforms. But Bihar, Uttar Pradesh, and West Bengal show a negative growth rate for the reforms period up to 1995-96. Even considering the period up to 1999-00, since the introduction of reforms only six states show a higher annual growth rate than the pre-reforms period. Overall, reforms have had a negative impact on the rate of growth of revenue expenditure on elementary education, and the recovery has not been strong enough even over a longer time horizon except for Kerala, Maharashtra, Gujarat, and Assam.

If we look at the period between 1985-86 and 1993-94, Orissa, Himachal Pradesh, and Karnataka had the highest rates of growth. Gujarat, West Bengal, and Kerala had the lowest rates of growth of elementary education expenditure, in that order. However, the period up to 1995-96 shows that Orissa, Rajasthan, and Himachal Pradesh had the highest growth rates while Andhra Pradesh, West Bengal and Punjab had the lowest. For the period up to 1999-00, it is found that Punjab comes to the bottom of the list and Himachal Pradesh moves to the second position. Punjab and West Bengal, thus, were affected the most by the introduction of reforms in terms of expenditure on elementary education. But looking merely at rates of growth of public expenditure on education is not enough. What we need to do is to complement the analysis of trends in financing elementary education with the results in terms of educational achievements and the level as well as quality of services.

**Table XII: Public expenditure Index with base year 1985-86 as 100**

State	1985-86	1990-91	1991-92	1993-94	1995-96	1996-97	1999-00
Andhra Pradesh	100	123.3	119.2	130.2	124.2	120.8	188.3
Assam	100	132.7	144.6	157.5	194.6	209.0	298.6
Bihar	100	157.6	145.9	146.6	154.3	179.3	282.4
Gujarat	100	111.7	114.1	121.8	143.0	148.9	196.8
Haryana	100	155.7	148.1	159.4	191.4	178.0	225.1
Himachal Pradesh	100	180.6	155.3	211.5	197.1	210.8	316.4
Karnataka	100	136.4	137.8	185.8	169.9	191.1	249.7
Kerala	100	125.5	113.3	124.3	153.4	159.7	213.8
Madhya Pradesh	100	151.1	151.1	161.0	186.1	188.2	201.1
Maharashtra	100	127.1	143.5	134.0	183.6	164.2	239.2
Orissa	100	186.1	209.5	228.8	271.6	264.2	377.2
Punjab	100	133.7	122.0	144.2	136.4	141.0	164.7
Rajasthan	100	165.3	151.9	165.2	216.1	225.4	313.3

Tamil Nadu	100	150.7	156.1	157.3	163.4	170.8	203.2
Uttar Pradesh	100	210.1	162.5	170.4	180.2	215.6	278.1
West Bengal	100	150.9	131.8	124.4	129.2	123.3	180.2
Total	100	149.0	142.1	150.6	201.1	225.6	366.7
Total (All States & UTs)	100	148.8	142.2	150.2	169.6	177.1	239.6
Centre (Total)	100	627.7	691.2	916.2	2471.5	3612.1	4046.1
Grand Total	100	148.4	142.4	151.6	180.9	195.8	259.2

Source: Government of India, 1995, and Government of India, *Analysis of Budgeted Expenditure on Education*, various years.

We arrived at the inter-state differences in public expenditure per child, by taking the average of expenditures at constant prices (base 1993-94) for the period 1993-94 to 1995-96 and dividing it by the 6–14 year child population on September 30, 1993. The highest spender came out to be Himachal Pradesh, while the lowest was West Bengal. Of the 16 major states considered here, seven states had expenditure less than the average of Rs 654. Orissa is just at the average when expenditure by the Centre is included and slightly above the average when only the combined average for states and Union Territories is considered. The worst performers turn out to be West Bengal, Uttar Pradesh, Andhra Pradesh and Bihar, in that order. The best are Himachal Pradesh, Kerala, Gujarat, Assam, and Tamil Nadu, in a descending order.

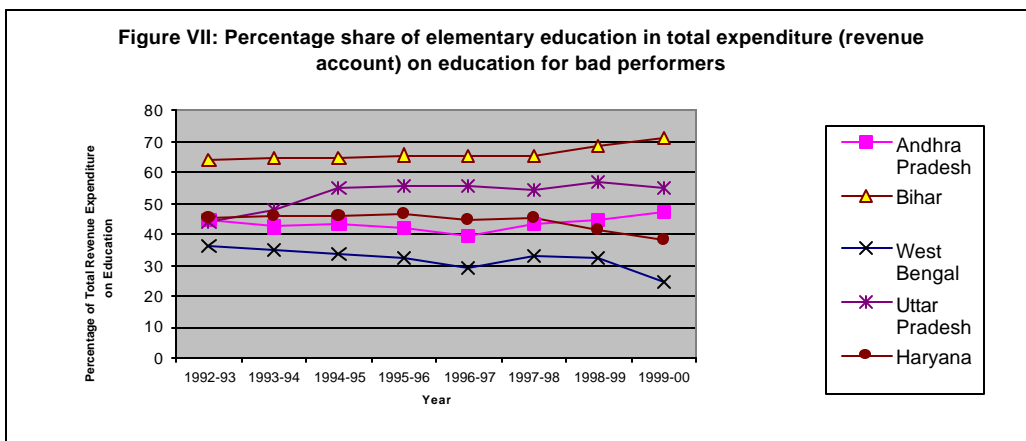
State	Pre reforms	Reforms period	Including both pre reforms and reforms period

	1985- 86 to 1990- 91	1991- 92 to 1993- 94	1991- 92 to 1995- 96	1991- 92 to 1999- 00	1985- 86 to 1993- 94	1985- 86 to 1995- 96	1985- 86 to 1999- 00
Andhra Pradesh	4.27	1.85	0.15	4.82	3.36	2.19	4.62
Assam	5.82	5.86	7.95	9.43	5.84	6.88	8.13
Bihar	9.52	-2.37	-0.42	6.69	4.90	4.44	7.70
Gujarat	2.24	2.92	5.06	6.50	2.50	3.64	4.96
Haryana	9.26	0.78	4.22	4.18	6.00	6.71	5.97
Himachal Pradesh	12.54	5.41	1.77	6.43	9.81	7.02	8.58
Karnataka	6.41	10.84	4.49	6.95	8.05	5.45	6.75
Kerala	4.66	-0.32	4.09	6.09	2.76	4.37	5.58
Madhya Pradesh	8.60	2.15	4.25	3.23	6.14	6.41	5.12
Maharashtra	4.91	1.79	7.64	7.28	3.73	6.26	6.43
Orissa	13.22	7.14	7.86	8.17	10.90	10.51	9.95
Punjab	5.98	2.55	0.40	2.34	4.68	3.15	3.63
Rajasthan	10.57	-0.01	5.51	7.36	6.48	8.01	8.50
Tamil Nadu	8.54	1.45	1.64	3.38	5.83	5.03	5.20
Uttar Pradesh	16.01	-6.75	-3.02	3.16	6.89	6.07	7.58
West Bengal	8.58	-6.23	-3.06	1.99	2.77	2.59	4.29
Total	8.30	0.37	6.18	10.53	5.25	7.23	9.72
Total (All states & UTs)	8.28	0.30	2.65	5.43	5.21	5.43	6.44
Centre (Total)	44.39	13.43	31.54	23.00	31.90	37.81	30.25
Grand total	8.21	0.72	4.04	6.40	5.34	6.11	7.04

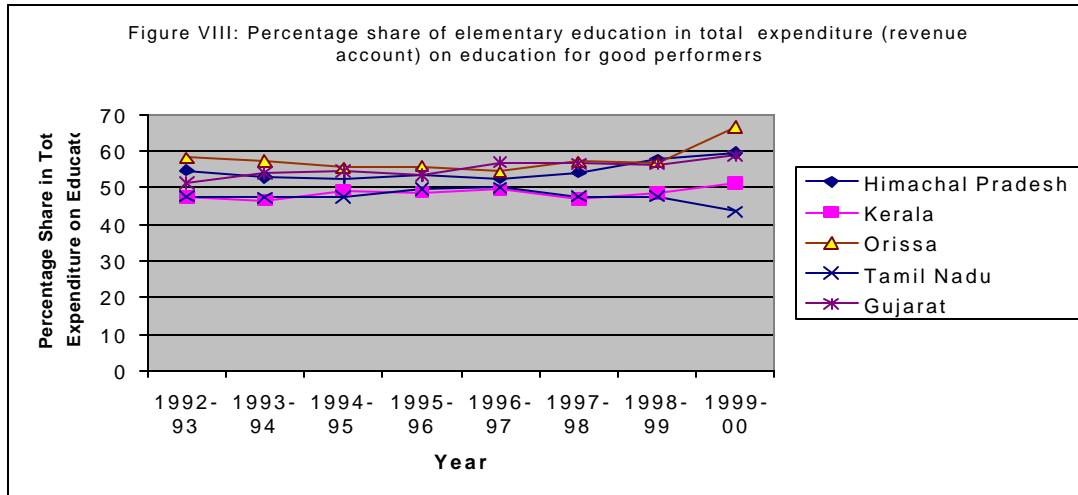
Source: Calculations based on Govt. of India, 1995 and *Analysis of Budgeted Expenditure on Education*, various years.

It must be noted here that Kerala and Himachal Pradesh show the lowest dropout rates and the best teacher–pupil ratio in 1996—the two indicators, our analysis shows, are affected the most by public expenditure. An interesting case is that of Rajasthan, which is often

clubbed with Uttar Pradesh and Bihar. Rajasthan features among the higher-than-average spenders on elementary education. Figure VII shows the percentage of the total (plan + non-plan) budgeted revenue expenditures that goes to elementary education for the worst performers mentioned above. Bihar does provide a large share to elementary education (although the absolute amount is very low). While it has gone up for Uttar Pradesh, it has been declining for Haryana and West Bengal. There seems to be an effort being made by Bihar and Uttar Pradesh to take care of elementary education. Figure VIII presents the share of elementary education on the revenue account in the total budgeted expenditure on education for the better-performing states. Orissa, which comes closest to the all-India average, has put in a higher share for elementary education. Gujarat shows an increasing trend in general. Himachal Pradesh has maintained a more than 50 per cent share of elementary education. Kerala and Tamil Nadu show almost the same levels of share of elementary education that is tending towards the 50 per cent level. Thus, in the reforms period there seems to be greater stress being placed by the low-performing states of Bihar and Uttar Pradesh on basic education in terms of allocation to elementary education. West Bengal, on the other hand, not only spends less on elementary education per child but is also reducing the share of elementary education in the total expenditure on education. This could lead to a dismal state of the education sector in this state.



Source: Government of India, *Analysis of Budgeted Expenditure*, various years. Figures for 1999-00 are Budget Estimates.



Source: Government of India, *Analysis of Budgeted Expenditure*, various years. Figures for 1999-00 are Budget Estimates.

### VIII. Conclusion

Elementary education gains relevance because it is the base of the educational pyramid, and the success of East Asian economies has given further credence to the idea of having a wider educational base. Since education has the nature of both a public and private good, there is a case for the cost of education to be shared by both the state as well as the individual. Further, in a poor country like India, elementary education needs to be fully financed by the state, especially for the poorer groups.

The importance of public expenditure cannot be gainsaid, particularly in retaining children in school and improving the quality of services. Public expenditure per child and the rate of growth of expenditure did not seem to have a strong influence on the rate of enrolment for 16 major states of India. However, the argument that the quality of schooling and public expenditure on education does not affect educational output may be due to the fact that the efficiency of this expenditure is ignored. Once the efficiency of expenditure is taken note



of, the effect is seen to be stronger. In general, it may be argued that some states employ better educational processes so that the link between school input and educational outcome becomes stronger. In these states, increases and decreases in public expenditure would influence outcome strongly. While public expenditure may not directly influence private expenditure on education, it certainly does have an effect via improved quality and greater expenditure efficiency. Literacy rates as well as state domestic product were seen to have a positive influence on education. A higher level of education is seen to positively influence public expenditure on education and may influence the government to improve the quality of services. Higher per capita income has a strong link with private expenditure on education, which may be related to both—a higher capacity to incur expenditure as well as a perception of returns from education. Thus, a virtuous cycle is likely to start with the demand- and supply-side factors positively influencing each other. The state then needs to take care of factors that influence demand for education, more importantly, non-monetary constraints that generate interest in education. The low rates of return to lower levels of education, noted in the literature in the Indian context, coupled with the high expenditure that households incur, tend to explain the lack of interest shown by households in providing education for children. It also suggests that government expenditure directed at reducing the expenditure of households on books, uniform and examination and other fees may prove to be demand-inducing, and hence, increase enrolments.

Although elementary education has been given high priority by the state in India in terms of the share of expenditure on elementary education in GDP, the targeted level of 6 per cent was never achieved. What is of great concern is that the enrolment rates remain low even after 50 years of independence, particularly in the case of the poor, women and those residing in rural areas. Public expenditure, thus, assumes a very significant role, keeping in mind the externalities associated with education. The state governments incur a major part of the spending. Since spending is related to deprivation levels, the state governments assume a special role in improving the educational level.

The regional variations in educational achievements also suggest the same conclusion. Kerala and Himachal Pradesh, with the highest per child public expenditure, have the lowest dropout rates and the lowest number of students per teacher. The level of 50 per cent of the total budgeted expenditure on education may be the level that other states need to target.

The reforms brought a break in the growth rates of public expenditure on elementary education, from which not all the states could recover. Only the Centre maintained a continuous growth in expenditure. The worst performers such as Uttar Pradesh and Bihar showed the greatest negative impact of reforms. The worst affected was West Bengal. What is important is that the laggards in terms of educational achievements seem to be spending more on elementary education in order to correct the historical anomaly. This is an encouraging sign.

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