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Emerging Challenges for Indian Education Policy

by

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Emerging Challenges for Indian Education Policy

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Abstract

This paper employs a large data set (1993 Human Development of India) to examine whether and how school quality affects households' enrollment decisions in India. Regressions using instrumental variables find that better school quality, measured by lower student-teacher ratios, tends to increase the probability that both boys and girls will attend school. The paper also finds the effect of school quality to vary with the socio-economic characteristics of the household. In particular, households and regions with a lower level of education attainment are more adversely affected by poor school quality than are better-schooled households and regions. Government expenditure on schooling is negatively correlated with variations in school quality, or schooling inequality. To explain why school quality matters less for more educated households, this paper investigates the role of privately financed inputs. Although richer households have increased their use of private schools and home tutors more than have poorer households, we cannot conclude, therefore, that households use private schooling inputs to substitute for the poor quality of public schools. The empirical evidence seems to suggest that higher public schooling expenditures are positively correlated with more rapid growth in private school enrollments. This is the "public" nature of India's "private" schools, which may reflect governmental regulation of private schools.

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1. Introduction

The Indian economy has witnessed significant improvements in the level of schooling over the past fifty years. For example, literacy rates have increased from 27% for males (ages 5 and above) and just 9% for females in 1950, to 64% for males and 39% for females in 1991. Despite such improvements, the quality of elementary schooling in India remains very low (World Bank 1997). Drèze and Sen (1993) document the deficiencies in "unobservable" aspects of school quality, such as teacher attendance and performance. However, Indian schools fall short not just in such unobservable aspects of quality. They are also characterized by very low levels of "observable" measures of school quality, such as student-teacher ratios. The average student-teacher ratio in primary schools is 37 in urban India, and 41in rural India.[1] This ratio varies considerably across India, averaging 31 in rural Kerala and 50 in rural areas of Andhra Pradesh and Bihar.

This paper provides evidence of the importance of observable measures of school quality for the schooling decisions made by Indian households. It also provides evidence that school quality has a greater effect on the schooling decisions of less-advantaged households, i.e., those with relatively low levels of parental schooling. While a number of studies have examined the dependence of schooling outcomes in India on student-teacher ratios and other measures of school quality, most of these studies have been based on relatively small samples of data from selected regions of the economy. This is because national household surveys which provide information on the schooling of Indian children as well as on the quality of the schools they attend were, until now, not available. This study uses one of the few Indian data sets that provide this information, the 1993 HDI (Human Development of India) data set collected by the National Council of Applied Economic Research (NCAER).

The differential effect of school quality on households from different socio-economic backgrounds suggests that low school quality may increase inequality in schooling attainment. While increased schooling inequality is of direct concern, it is also of concern because of recent research which links inequality to growth. Using data from recently released national sample surveys spanning the decade 1986 to 1996, this paper provides evidence that schooling inequality in India has, indeed, increased significantly over the past decade. It also provides evidence of the correlation between schooling inequality and governmental investments in the schooling sector. Such evidence has not previously been documented.

A rigorous empirical analysis of the factors that underlie the differential effects of school

quality on household schooling investments is beyond the scope of this paper. However, preliminary data analysis suggests that part of the explanation lies in households' increasing use of privately financed schooling inputs. Data on enrollments in private schools and on the use of home tutors reveal that households have significantly increased their use of both these inputs in recent years. This increase has been particularly notable amongst better-off households, suggesting that the growth of private schooling inputs may underlie the observed growth in schooling inequality. However, the available data also suggest that the negative correlation between governmental schooling expenditures and inequality reflects the rise in home tutoring rather than the growth of private schools. This may reflect the "public" nature of many of India's "private" schools; the majority of private schools are financed by state governments. It may be the case that the growth of the private schooling sector and, correspondingly, the extent to which it offers households an alternative to low quality public schools is limited by government regulation.

The rest of this paper is organized as follows. Section 2 presents a brief overview of schooling in India, describing data on both the level of attained schooling and its quality. The substantive empirical analysis of this paper is in Section 3, which establishes the effects of school quality on enrollments. This section also examines whether these effects differ across households differentiated by levels of parental schooling, and provides evidence of a correlation between public expenditures on schooling and schooling inequality. Section 4 undertakes a preliminary analysis of the hypothesis that the use of private schools and home tutors explains the differential effects of school quality on enrollments. Section 5 concludes.

2. Overview of Schooling Attainments in India

India has made substantial strides in improving educational attainment over the past fifty years. Gross enrollment rates, for example, have increased from 82% for boys and 33% for girls in 1951 to 116% for boys and 88% for girls in 1992.[2] Despite relatively high dropout rates, currently, 65% of all boys and 60% of all girls complete the first five-year cycle of primary schooling.

But much remains to be done. There are significant regional differences; primary school completion rates vary from 100% in Kerala to 40% in Bihar. And, there are significant gender differences; in Rajsthan, 1993 data showed that only 38% of rural girls between the ages of 6 and 11 are *enrolled* in schools. Nevertheless, it appears that the margin of choice for many households in the country is slowly shifting away from a decision on whether or not to send their children to primary

school to a decision on whether or not to enroll in the next level of schooling, i.e., middle schools.

These improvements in the level of schooling are partly the consequence of increased governmental expenditures on schooling. Table 1 provides data on schooling expenditures in constant 1980-81 Rupees for India and for the 16 major states. For the country as a whole, schooling expenditures per student have increased from just Rs. 190 in 1980-81 to Rs. 341 in 1995-96. State governments have considerable autonomy in educational decision-making, and this is reflected in the significant variation in both the level of expenditure and in its growth across the states.[3] Thus, in 1995-96 the state of Kerala spent Rs. 777 per student, an increase of 89% from Rs. 411 in 1985-86. In contrast, West Bengal increased its schooling expenditures per student by only 11% in this period, from Rs. 178 in 1985-86 to Rs. 198 per student in 1995-96.[4]

Government investments have financed a tremendous growth in the number of schools and in schooling infrastructure. The number of primary schools has increased from 209,671 in 1950 to 572,923 in 1993, so that currently 95% of the rural population has access to a school within a walking distance of 1 km. Public schooling expenditures have also financed a number of initiatives intended to improve other aspects of schooling infrastructure and hence school quality. These include "Operation Blackboard," a scheme introduced in 1987-88 with the objective of improving schooling infrastructure, including teachers, in all primary schools. More recently, the Government has implemented an ambitious District Primary Education Programme (DPEP), which decentralizes decision making so as to improve the delivery of educational services. The government has simultaneously taken steps to improve the quality of teaching. It has set up a National Council for Teacher Education to maintain standards for teacher education programmes. And, it offers pre-service and in-service training facilities for school teachers and those involved in adult education and non-formal educational programs at the district level through District Institutes for Education and Training (DIETs).

Despite these measures, the growth in infrastructure has barely kept pace with the growth in the school-age population. Data from the *All-India Educational Surveys* conducted by the National Council of Educational Research and Training (NCERT) reveal that the ratio of the number of children ages 6 to 11 to the number of primary school teachers actually *increased* between 1978 and 1993, in both rural and urban India. The 1978 ratios were 70.8 and 63.8 in rural and urban areas respectively, while the 1993 ratios were 88.6 in rural India and 68.8 in urban India. Student-teacher ratios in rural middle schools showed little change; the ratio of the number of rural children ages 11

to 14 to the number of rural middle school teachers fell from 58.9 in 1978 to 58.5 in 1993. Significant improvements occurred only in urban middle schools, where the student-teacher ratio fell from 55.9 in 1973 to 48.9 in 1993.

3. Does School Quality Affect Schooling Attainment?

3.1 Regression estimates of the effect of student-teacher ratios on enrollment

The Appendix to this paper sketches a theoretical framework that explains the determinants of schooling decisions. This framework suggests that the demand for schooling will depend on the quality of schools, as well as on traditional factors such as household income and the direct and opportunity costs of schooling. It also suggests that the effect of school quality on schooling may differ across households distinguished by wealth.

This section takes this framework to the data to test whether school quality affects enrollment decisions. The available empirical evidence on this issue is mixed. While much of the literature suggests that school quality has little or no effect on schooling,[5] Lazear (1999) and others have suggested that estimates of the effect of school quality based on least squares regressions are biased. This is because student-teacher ratios may be correlated with unobservable determinants of schooling attainment. If so, it would be wrong to interpret the effect of the student teacher ratio on schooling attainment as a pure "quality" effect. The correlation between student teacher ratios and unobservable components of schooling attainment may reflect the endogenous determination of the number of students, but may also result if the number of teachers is endogenously chosen on the basis of local socio-economic variables which also affect schooling investments, such as the return to schooling. Empirical studies that allow for the endogeneity of schooling investments do, indeed, find that school quality matters (Angrist and Lavy 1998, Card and Krueger 1992).

Relatively few studies have examined the effect of school quality on schooling outcomes in India. Sipahimalani (1998), using data from a large 1993 cross-sectional survey of approximately 30,000 rural Indian households,[6] finds that variables such as the distance to a school, the proportion of male teachers, and the provision of midday meals do affect schooling attainment. Her estimates, however, do not allow for the possible endogeneity of these variables. Drèze and Kingdon (1999) also provide evidence of the importance of student teacher ratios in India, based on a smaller survey of approximately 4,000 children in the Indian states of Bihar, Madhya Pradesh, Rajsthan and Uttar Pradesh.[7] They find that the *child*-teacher ratio has a negative effect on schooling attainment. This

negative effect persists, even in regressions which instrument the child-teacher ratio with the distance separating the village from the nearest road. The empirical work of this section provides further evidence on the effects of school quality on India, based on the larger NCAER data set, and using an alternative set of instruments.

Empirical tests of whether school quality affects enrollment requires defining some quantifiable measure of school quality. While there are many dimensions to school quality, data availability frequently determines this choice; data on important attributes such as teacher attendance and the quality of teaching are rarely available. As in much of the empirical literature (Card and Krueger 1992, Drèze and Kingdon 1999), I proxy school quality by student-teacher ratios. Future research may find other dimensions of quality to be of greater quantitative importance. Nevertheless, evidence that any one measure of schooling quality affects schooling attainment does suggest the importance of schooling quality, even though it may provide little guidance as to which type of investments are likely to have the largest incremental effect on schooling attainment.

The NCAER 1993 data set used for the empirical work of this section provides information on schooling as well as on standard household socio-economic variables for approximately 30,000 rural Indian households in 15 of India's major states. The household questionnaire was supplemented by a village survey, which provides information on local schools. This data on school enrollments and the number of teachers facilitates the calculation of student-teacher ratios for the school attended by the student in question. I consider the effect of student-teacher ratios on the probability that a child between the ages of 6 and 11 in any given household will attend school. These regressions are run separately for boys and for girls. In addition to student-teacher ratios, the set of regressors include the following variables: The number of children in the household in three different age groups (0-5, 6-11, 12-19); the number of household adult males and females in two age groups; the proportion of primary schooled males and literate women in the village; the standard deviation in these measures of adult schooling in the village; the mean and standard deviation in farm size in the village; and a set of dummy variables for the state of residence.

Table 2 provides results from both Least Squares (OLS) regressions and from instrumental variables (IV) regressions, which instrument student-teacher ratios so as to correct for the potential endogeneity of these variables.[8] Since the Government of India determines the number of teachers assigned to any given village school primarily on the basis of the child-age population in the village, I use the village child population between the ages of 6 and 11, and the square of this variable, as

instruments. The child population at the level of the village is calculated on the basis of the household survey data, appropriately weighted to correct for the non-random nature of the sample.[9]

While the OLS estimates, which treat the student-teacher ratio as an exogenous variable, yield no statistically significant effect of school quality on schooling attainment, the instrumental variable regressions find that school quality *does* matter, both for boys and for girls; an increase in the number of teachers per student, or a decline in the student-teacher ratio, significantly increases the probability that both boys and girls will attend school.

3.2 Testing for differential effects of school quality across households

The third regression in table 2 allows the effect of school quality to vary with the socio-economic characteristics of the household. Specifically, it allows the student-teacher ratio to differentially affect the enrollment decisions of households distinguished by levels of parental education (dummy variables for whether the mother is literate and whether the father has completed primary school). The instrumental variable estimates accordingly treat the student-teacher ratio as well as its interaction with parental schooling as endogenous variables, using interactions of the school-age population with the full set of exogenous variables, as well as higher order terms in these variables, as instruments.

The results indicate that the effect of school quality on attendance is smaller in households in which parents are relatively better schooled. Thus, in households in which the father has completed primary schooling, a 10% improvement in the student-teacher ratio increases the probability that his son will attend school by only 1%, in contrast to the 6% increase which is observed in households in which the father has not completed primary school. Similarly, while school quality significantly affects the schooling outcomes of children of illiterate mothers, it has a statistically insignificant effect on the children of literate mothers. This means that school quality matters more in states such as Bihar, where only 38% of rural fathers have primary or higher levels of schooling and only 13% of rural mothers are literate, than in educationally advanced states such as Kerala, where the corresponding figures are 59% and 64% respectively. Similarly, within any state, the enrollment decisions made by poorer households are more affected by school quality than are the schooling decisions of richer households. Thus, educationally backward households and regions pay the costs of poor school quality to a far greater extent than do better schooled households.

3.3 Public Schooling Expenditures and Schooling Inequality

The differential effects of publicly financed school quality on the enrollment decisions of households distinguished by socio-economic status suggests a correlation between the level of government schooling expenditures and schooling inequality, defined as the difference in the schooling attainment of children from different socio-economic backgrounds. This section examines the evidence on schooling inequality in India, and presents evidence of a link between schooling investments and governmental expenditures on schooling. The extent of inequality in a society is, of course, of direct policy concern, particularly in countries such as India, which have always had a strong commitment to reducing socio-economic inequalities. A recent literature suggests that high levels of income inequality also adversely affect economic growth (Galor and Zeira 1993; Aghion and Bolton 1997; Alesina and Rodrik 1994), providing one more reason for concern about trends in schooling inequalities.

Available data reveal that schooling inequality has increased over recent decades. Figure 1 compares schooling attainments for urban and rural households in the lowest expenditure quartile relative to the highest, graphing the proportion of 15 to 18 year olds from each of these quartiles who completed the 8 years of middle schooling. For urban households in the lowest income quartile, this proportion increased from 34% to 49% between the years 1986-87 and 1995-96, an increase of 44%. However, the proportion of 15 to 18 year olds completing middle school from households in the highest expenditure quartiles increased by 73% in this same period, from 52% to 90%. In rural India, too, the improvements in schooling witnessed in rich households far exceeded the improvements registered in poor households. The proportion of rural 15 to 18 year olds completing middle school increasing from 24% to 32% for households in the lowest expenditure quartiles, while it increased from 40% to 67% for households in the highest expenditure quartile.

Figure 2 examines the correlation between schooling inequality and government expenditures on schooling. This is done by graphing levels of schooling inequality across states ranked by their 1995-96 levels of per capita educational expenditure on students in elementary schools. Schooling inequality is measured as the ratio of 15 to 18 year olds completing middle school from households in the top expenditure quartile relative to those from the lowest expenditure quartile. This figure suggests that government schooling expenditures are also negatively correlated with schooling inequality. Inequality is highest in West Bengal, the state that spent the least on schooling per student. And, inequality is lowest in Himachal Pradesh and Kerala, states that spent Rs. 612 and Rs.

777, respectively, on education per student.

4. Initial Evidence on Factors Underlying the Differential Effect of School Quality

The regression estimates of the previous section do not provide insights into *why* student-teacher ratios matter less for more educated households. It may be that parents who are themselves well schooled place a high value on schooling, regardless of quality, and this difference in the utility value of schooling yields corresponding differences in the effect of school quality on schooling enrollments across households. Alternatively, as suggested in the theoretical framework, better-schooled parents may have access to substitutes for high student-teacher ratios, substitutes that are privately financed and hence less affordable for low-income households. Any negative correlation between the consumption of such private alternatives and school quality could also generate the differential effects of student-teacher ratios on enrollments revealed in the previous section.

An empirical investigation of the role of privately financed inputs in explaining the effect of student-teacher ratios on enrollments would have to allow for the endogeneity of investments in such inputs. Such an analysis is rendered difficult by the lack of appropriate instruments, that is, variables that are correlated with private schooling inputs but uncorrelated with enrollment decisions. Lacking such instruments, I instead confine myself to a descriptive analysis of the importance of two such inputs, private schools and home tutoring.

Section 4.1 considers trends in the use of private schools and home tutors, and provides evidence that households from different expenditure quartiles do, indeed, differ in their use of these inputs. This suggests that the increased use of private schooling inputs may explain the increase in schooling inequality documented in the previous section. However, such evidence is not sufficient to conclude that government investments in schooling explain the growth of the private schooling sector. Further evidence on this point is provided in Section 4.2, which examines the correlation between the growth of private schools and home tutors, and levels of governmental schooling expenditures. The growth in private schools appears to be higher in states, which spend more on schooling, and Section 4.3 suggests that this may reflect governmental regulation of the private schooling sector. Section 4.4 presents available data on observable dimensions of quality in private and public schools in order to evaluate the factors that explain the growth of private schools.

4.1 The Growth in Private Schools and Home Tutors

Urban India has witnessed a staggering increase in private schooling at the primary and middle levels over the past decade.[10] This is revealed in table 3, which provides data on the percentage of urban children enrolled in private schools for the four different levels of schooling in 1986-87 and in 1995-96. These data reveal that the percentage of urban students enrolled in private primary schools increased from 37% in 1986-87 to 59% in 1995-96, while the percentage enrolled in private middle schools increased from 35% to 57% in the same period. Rural India, too, has witnessed substantial increases in the importance of private schools (table 4). Thus, the percentage of rural children enrolled in private primary schools increased from 9% in 1986-87 to 21% in 1995-96, while the percentage enrolled in private middle schools increased from 17% to 26% in this same period.

The percentage importance of private school enrollment at the secondary and higher-secondary level during this same period did not change significantly. This may be a "cohort" effect; the increase in private schooling at the primary and middle levels between the years of 1986 and 1996 may very well result in an increase in private schooling at higher levels in the years to come. The lack of growth in private school enrollments at higher levels should not, however, mask the importance of private schools at this level. In urban India, 50% of the students who attend secondary and higher secondary schools are enrolled in private schools.

The data also reveal that households from India's upper expenditure groups increased their use of private schools to a far greater extent than households from the lower expenditure quartile. Figure 3 documents this increase in private schooling inequality at the middle school level for urban and rural households. In urban India, the percentage of children in households in the lowest expenditure quartile enrolled in private schools marginally *declined* from 30% in 1986-87 to 29% in 1995-96. In contrast, the percentage of children from households in the upper expenditure quartile in private schools increased from 42% to 70% in this same period.

The Indian economy has also witnessed a significant increase in the use of the purchased time of home tutors. Tables 5 and 6 provide data on purchased home tutoring in urban and rural India, respectively. These data show that the percentage of urban households reporting expenditures on private tutoring has increased significantly at all levels of schooling. For example, at the higher secondary level, as many as 40% of households report home tutoring for sons, an increase from 32% a decade ago.[11] Rural India has not witnessed the same increase in the percentage of households reporting home tutoring. Nevertheless, a quarter of rural households report expenditures on home

tutoring for sons enrolled in secondary and higher secondary schools.

As with private schools, it is rural and urban children from the upper expenditure quartile who have significantly increased their use of home tutors. This increase in home tutoring inequality is revealed in figure 4, which compares the importance of home tutoring for different expenditure quartiles between the years 1986-87 and 1995-96 in urban and rural India respectively. The greater use of home tutoring and private schools amongst better-off households suggests that the use of these inputs could explain why such households are less affected by student-teacher ratios in public schools.

4.2 Are Private Schools and Home Tutoring Substitutes for Government Schooling Expenditures?

The increase in the use of private schooling inputs suggests that this increase may partly explain the rise in schooling inequality documented in the previous section. However, this need not imply that households use private schooling inputs to substitute for the poor quality of public schools. The growth in private schooling may be unrelated to governmental investments in schools; it may reflect an increase in the price of those dimensions of school quality, which are exclusively offered by private schools. Similarly, home tutoring could have increased because it complements, rather than substitutes for, school quality. Yet, if the use of private schooling inputs is to explain the differential effects of school quality on enrollments (table 2), such inputs must be negatively correlated with observable dimensions of school quality. This section provides evidence on the nature of the correlation between government schooling expenditures and the growth in both home tutoring and private schools.

Figure 5 documents the growth in home tutoring for middle school students in urban India between the years 1986-87 and 1995-96 across states ranked by their level of spending for elementary schools in 1985-86. The negative correlation between the growth of home tutoring and government expenditures on schooling is evident. Thus, Orissa, which spent only Rs. 153 per student on elementary education (in constant 1980-81 Rupees) reports the highest growth in the number of middle school students reporting expenditures on home tutors, in both rural and urban areas. Orissa is followed closely by West Bengal, a state that has long been characterized by its low spending on schooling. In urban West Bengal, 90% of the students enrolled in higher secondary schools also receive home tutoring, up from 66% a decade ago. The negative correlation between the growth of private tutoring and state expenditures on schooling suggests that home tutoring does indeed

substitute for low school quality.

A similar examination of the correlation between the growth of private schools in urban India and state-level expenditures on schooling reveals little evidence of a negative correlation (figure 6). If anything, figure 6 suggests a *positive* relationship between schooling expenditures and the growth of private middle schools. Thus, states such as Andhra Pradesh, Gujarat, Maharashtra and Haryana, all of which recorded above-average per capita expenditures on elementary schooling, report the greatest growth in the number of students enrolled in private middle schools in urban India. Conversely, the growth of private schools has been relatively low in states such as Orissa, West Bengal and Assam, states characterized by low levels of per capita expenditure by state governments on schooling.

4.3 The "public" nature of Indian "private" schools

The evidence suggests that states that spend relatively more on schooling have experienced more rapid growth in private school enrollments. This may very well reflect underlying factors such as the return to schooling. Relatively high rates of return to schooling in states such as Maharashtra and Gujarat may cause state governments to respond by increasing expenditures on schooling, and may also fuel the growth of the private sector. However, the nature of the private schooling sector in India also suggests a direct link between state spending on schooling and the growth of the private sector.

Private schools fall into two categories, aided and unaided. Table 7 provides information on enrollments in private aided and unaided schools. These data reveal that enrollments in private aided schools exceed those in unaided schools at all levels beyond the primary level. Private aided schools are privately managed, but are financed almost exclusively by state governments. Indeed, Tilak (1990) notes that 95% or more of the total expenses of private aided schools are borne by state governments. The dependence of private aided schools on state financing, and the relative importance of such schools, suggests that the level of governmental expenditure on schooling financing of education directly affects the quality not just of government schools, but also that of private aided schools. This in turn may explain the slow growth of private schools in regions characterized by low governmental schooling expenditures.

The dependence of private aided schools on public financing reflects state regulation of the schools fees that these schools can charge. In states such as Uttar Pradesh, private aided schools, like

government schools, are prohibited from charging any tuition fees, even in secondary schools (Kingdon 1996). In 1995-96, only 53% of students enrolled in private aided schools in urban India reported paying tuition fees, and the average amount of such fees was only Rs. 366 per student per year.

State regulation of private-aided schools extends beyond the regulation of school fees. For example, private aided schools in Uttar Pradesh cannot recruit or dismiss their own staff (Kingdon 1996). Government regulation also extends to private *unaided* schools. This is because all private schools are further divided into "recognized" and "unrecognized" schools. "Recognition" is required, since only recognized schools can issue valid "transfer certificates" to students leaving the school, certificates which are in turn required for admission to other schools, including higher-level schools. Table 7 reveals that the overwhelming majority (approximately 80%) of private unaided schools in urban India are recognized schools. In order to be recognized, the school must abide by certain conditions. Again, these vary across states, but frequently extend to regulation of teacher salaries and tuition fees (Kingdon 1996). These regulations undoubtedly reduce the competitiveness and efficiency of private schools.

4.4 What explains the growth of private schools?

The above section describes the extensive regulation of private schools, particularly private aided schools. Despite such regulation, there has been a significant increase in enrollments in private schools, an increase that was documented in Section 4. What explains this growth?

Table 8 compares student-teacher ratios across public and private schools in urban and rural India, further distinguishing between private aided schools and unaided schools. It also provides data on other observable components of school quality, namely the percentage of trained teachers and the percentage of teachers with graduate degrees.

The data reveal that student-teacher ratios in private schools are not significantly higher than the ratios observed in government schools. Indeed student-teacher ratios in secondary and higher secondary schools are marginally lower in government schools than in private aided schools, in both urban and rural India. The lack of any significant difference in student-teacher ratios and other observable measures of quality across private and public schools implies that such factors cannot explain the growth in private schools.

This suggests that if private schools do produce superior schooling, it must be because they

differ from public schools in "unobservable" components of quality, such as teacher performance and management practices (Bashir 1994). However, the importance of schooling practices and inputs relative to other variables, such as the superior quality of the student body in private schools has not yet been established for India. Research from several other countries, however, has consistently found that the average quality of the school body plays an important role in explaining both completed years of schooling and performance in standardized tests (Evans, Oates and Schwab 1992; Datcher 1982; Henderson, Mieszkowski and Sauvageau 1978). The data of this section which documents the trend towards even greater "sorting" of children from higher income Indian households into private schools suggests that the superior quality of the school body in private schools relative to public schools may also explain part of their advantage.

5. Conclusion

The average quality of schools in India remains very low, despite the investments made by the Central and State governments in schooling over the past fifty years. This paper provides evidence that low school quality has a cost; it significantly affects households' enrollment decisions. And, it particularly affects poorer households, characterized by low levels of parental schooling. This suggests a link between governmental expenditures on schooling and schooling inequality. The preliminary data analysis of this paper does, indeed, find evidence of such a relationship.

Given the low quality of government schools, one would have expected considerable growth in the private schooling sector. The data reveal that such growth has occurred, but also reveal that private school enrollments have increased the most in states which spend relatively more on elementary schooling; private sector growth has been lower in states where the quality of public schools is low. As suggested in this paper, this may reflect governmental regulation of private schools.

A reduction in regulation may foster the growth of private schools. This is likely to improve the quality of schools, particularly in regions where school quality is currently low. Many argue against the growth of the private sector on the grounds that it would increase schooling inequality. However, there is little evidence on this issue; an increase in the supply of private schools may very well reduce school fees, making such schools more affordable to poorer households. The evidence suggests that even poor households are currently incurring significant schooling expenses, frequently in the form of fees for private tutoring. The willingness to pay for quality teaching suggests that poor

households would avail of good quality private schools, should they become available.

There has been surprisingly little discussion about the justification for and extent of regulation of India's schooling sector, despite the fact that the structural reforms of recent years have opened up debate on the regulation of almost every other sector in the Indian economy. I believe that such a debate on school reform is long overdue, and is essential for the significant improvements in schooling, which will be required to take India through the 21st century.

Appendix

This appendix briefly sketches a theoretical framework for the determinants of schooling decisions. This framework helps interpret the regression and data analysis of this paper.

Assume that households gain utility from some composite consumption good, c, and from the human capital of their children, h. The household's utility function is therefore U(h,c). Human capital is "produced" by time spent in schools, s, the quality of schools, q, and by household expenditures on private schooling inputs, x, such as the purchased time of private home tutors. The vector x could also include aspects of school quality which are not readily available in public schools, such as teacher quality, but which parents can purchase by enrolling their children in private schools.

Let u_i reflect the child's innate ability. Then, the human capital production function for child i in region j is:

(1) $h_{ij} = h(s_{ij},q_j,x_{ij},u_{ij})$

Levels of schooling, s, and expenditures on private schooling inputs, x, are chosen to maximize the household's utility function, subject to both the human capital production function and a budget constraint which constrains expenditures on consumption and on schooling inputs to equal income. This simple framework yields a demand for schooling time which depends on the quality of schools, q. It also varies with household income and with the price of consumption goods (p_c), the price of private inputs (p_x) and the price of schooling time (p_s). This latter price could include both direct costs associated with schooling, but also the opportunity cost of a child's time.

This framework also provides several explanations for why the effect of school quality on schooling time may vary across households. One possible explanation is differences in the degree to which households can substitute private inputs for school quality. To see this, consider the conditional demand function for schooling time, s, which conditions on optimal investments in private schooling inputs, x^*:

(2) $s_i = s(q,p_s,p_c,I,x^*(q,p_x,p_c,I))$

If some households are constrained in their consumption of private schooling inputs, x, the effect of q on s will vary across constrained and unconstrained households. Labor market imperfections may yield such constraints. For example, there may be no market for parental time spent on tutoring children. If better educated parents are superior home teachers, households with less educated parents will be constrained in their ability to substitute home schooling for parental time. In regions

where a market for private tutors does exist, such as in urban areas, any fixed costs of purchasing home tutors may render such tutoring unaffordable to low income households. Such fixed costs will exist if home tutors stipulate a minimum number of tutoring hours that parents must purchase.

Table 1: Per Pupil Expenditure on Elementary Education at Constant Prices (1980-81 = 100)

States	Elementary Education			
	1980-81	1985-86	1990-91	1995-96
Andhra Pradesh	189	232	225	222
Assam	176	209	227	329
Bihar	171	216	349	326
Gujarat	179	275	300	352
Haryana	296	412	561	530
Himachal Pradesh	365	371	539	612
Karnataka	188	231	266	272
Kerala	340	411	505	777
Madhya Pradesh	134	166	221	231
Maharashtra	205	284	344	349
Orissa	132	153	268	283
Punjab	215	273	366	349
Rajasthan	253	257	377	377
Tamil Nadu	164	219	323	332
Uttar Pradesh	150	204	367	255
West Bengal	172	178	228	198
All States	185	230	311	305
Centre	1	2	10	31
All India (centre+States+UTs)	190	239	322	341

Source: Government of India, Ministry of Human Resource Development. Analysis of Budgeted Expenditure on Education and Selected Educational Statistics.

Table 2: Effect of School Quality on Household Probabilities of Current Enrollment, Children 6-11.

Variable	Boys			Girls		
	OLS	IV	IV	OLS	IV	IV
Student-Teacher ratio	-0.0002	-0.007*	-0.009*	-0.0002*	-0.006*	-0.009*
	(0.00)	(0.002)	(0.002)	(0.0002)	(0.002)	(0.002)
Ratio * head primary	--	--	0.007*	--	--	0.003+
			(0.002)			(0.002)
Ratio * wife literate	--	--	0.004*	--	--	0.010*
			(0.002)			(0.002)
Head primary	0.14*	0.14*	-0.19*	0.17*	0.16*	0.001
	(0.01)	(0.01)	(0.08)	(0.01)	(0.01)	(0.08)
Wife literate	0.07*	0.06*	-0.11	0.13*	0.12*	-0.32*
	(0.01)	(0.01)	(0.08)	(0.02)	(0.02)	(0.10)
Land size	0.002*	0.001*	0.001*	0.001*	0.001*	0.001*
	(0.001)	(0.0005)	(0.0006)	(0.0005)	(0.0005)	(0.0006)
Sample Size	7,306	7,306	7,306	6,521	6,521	6,521

Note: All tables include state dummies; number of boys and girls in 3 age group (0-5, 6-11, 12-19); males and females in two age groups; child, male and female village wages; the proportion of primary schooled males and literate women in the village; the standard deviation in these measures of adult schooling in the village; and the mean and standard deviation in land size in the village.

Table 3: Percentage of Urban Children Enrolled in Private Schools

State	Primary		Middle		Secondary		Higher Secondary	
	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96
Andhra Pradesh	41	66	27	61	39	56	49	51
Assam	7	23	8	18	10	16	14	9
Bihar	36	48	20	31	17	18	17	16
Gujarat	22	63	29	63	51	60	48	65
Haryana	56	82	40	69	77	62	37	33
Himachal Pradesh	24	32	9	26	26	32	24	11
Jammu Kashmir	37	65	24	53	36	35	5	13
Karnataka	27	46	32	51	61	65	75	64
Kerala	40	57	15	49	51	54	74	73
Madhya Pradesh	23	41	17	36	27	28	28	25
Maharashtra	38	78	48	82	77	87	75	84
Orissa	16	24	17	22	28	13	51	36
Punjab	54	68	47	59	59	60	66	50
Rajasthan	40	59	23	44	35	31	16	24
Tamil Nadu	43	55	38	51	55	48	56	51
Uttar Pradesh	61	72	53	68	72	64	61	59
West Bengal	30	49	55	64	68	68	61	69
India	37	59	35	57	52	54	50	50

Source: NSS rounds 42 and 52.

Table 4: Percentage of Rural Children Enrolled in Private Schools

State	Primary		Middle		Secondary		Higher Secondary	
	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96
Andhra Pradesh	7	39	4	13	7	34	24	27
Assam	8	6	5	3	10	8	12	14
Bihar	5	10	4	10	6	6	12	11
Gujarat	1	12	7	13	44	25	35	25
Haryana	5	24	5	18	91	9	28	14
Himachal Pradesh	2	5	1	6	5	7	3	13
Jammu Kashmir	6	23	3	11	1	7	3	2
Karnataka	3	4	4	7	48	35	57	45
Kerala	41	50	55	44	67	46	84	78
Madhya Pradesh	1	5	2	5	8	9	13	8
Maharashtra	3	45	30	60	77	79	80	90
Orissa	7	4	29	20	64	32	69	80
Punjab	10	18	8	13	14	13	51	47
Rajasthan	2	8	2	5	3	3	3	12
Tamil Nadu	16	26	17	22	26	17	29	28
Uttar Pradesh	16	35	42	51	69	59	61	56
West Bengal	11	22	45	55	53	56	47	62
India	9	21	17	26	38	31	40	40

Source: NSS rounds 42 and 52.

Table 5: Percentage of Boys Reporting Private Tuition, Urban India.

State	Primary		Middle		Secondary		Higher Secondary	
	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96
Andhra Pradesh	24	24	31	35	35	40	38	37
Assam	18	23	21	33	38	46	22	45
Bihar	20	28	23	36	33	44	33	36
Gujarat	10	17	15	25	28	36	27	38
Haryana	13	18	15	22	30	32	19	31
Himachal Pradesh	3	6	5	11	11	23	--	22
Jammu Kashmir	10	33	25	43	42	58	39	82
Karnataka	15	16	16	19	19	22	9	19
Kerala	25	17	29	26	43	27	42	33
Madhya Pradesh	13	10	22	19	28	33	26	36
Maharashtra	15	21	24	32	37	49	36	41
Orissa	30	49	29	56	47	74	12	36
Punjab	11	15	18	23	21	36	29	29
Rajasthan	10	6	13	8	27	19	33	25
Tamil Nadu	17	17	23	27	31	29	29	32
Uttar Pradesh	14	18	18	30	27	43	23	40
West Bengal	45	59	54	76	68	88	66	90
India	18	22	24	32	34	42	32	40

Source: NSS 42 and 52 rounds.

Table 6: Percentage of Boys Reporting Private Tuition, Rural India.

State	Primary		Middle		Secondary		Higher Secondary	
	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96	1986-87	1995-96
Andhra Pradesh	10	8	21	17	27	18	34	26
Assam	7	4	10	7	24	17	18	12
Bihar	12	10	15	23	24	30	21	16
Gujarat	3	1	4	1	11	10	16	16
Haryana	2	8	4	18	21	25	21	21
Himachal Pradesh	–	1	2	3	4	4	12	12
Jammu Kashmir	9	11	12	35	26	56	32	67
Karnataka	2	1	6	4	9	6	9	24
Kerala	9	14	15	26	25	30	30	28
Madhya Pradesh	6	2	9	8	13	13	10	12
Maharashtra	4	1	10	6	24	15	22	15
Orissa	16	23	20	28	27	38	6	22
Punjab	6	4	9	9	28	20	25	17
Rajasthan	2	1	6	2	19	15	18	23
Tamil Nadu	8	8	14	10	29	24	30	33
Uttar Pradesh	3	4	7	11	20	26	15	22
West Bengal	31	37	53	67	61	75	62	73
India	8	8	13	17	25	26	24	25

Source: NSS 42 and 52 rounds.

Table 7: Types of Private Schools, 1995-96

	of total enrollments, % in		of totals in Private Schools, % in recognized schools	
	Private Aided Schools	Private Unaided Schools	Private Aided Schools	Private Unaided Schools
Urban				
Primary	25	25	96	73
Middle	32	15	98	82
Secondary	36	11	99	82
Higher Secondary	38	9	99	77
Rural				
Primary	6	7	95	47
Middle	14	5	98	59
Secondary	21	4	98	67
Higher Secondary	28	8	97	57

Source: NSS 52nd round.

Table 8: School Quality in Government and Private Schools, 1993, Urban and Rural India

	Government/Local Body	Private Aided Schools	Private Unaided Schools	All Schools
Urban India				
% Trained Teachers				
Primary	92	97	86	93
Upper Primary	93	93	73	88
Secondary	92	97	86	93
Higher Secondary	87	89	73	86
% of Teachers w/College degrees				
Primary	40	35	42	38
Upper Primary	49	49	73	55
Secondary	40	35	42	38
Higher Secondary	99	99	99	99
*Student-Teacher Ratios**				
Primary	35	43	30	37
Upper Primary	33	42	33	37
Secondary	29	35	29	32
Higher Secondary	31	39	30	35
Rural India				
% Trained Teachers				
Primary	88	94	77	89
Upper Primary	87	88	69	86
Secondary	88	94	77	89
Higher Secondary	77	88	53	80
% Teachers w/ college degrees				
Primary	32	27	27	29
Upper Primary	43	51	69	46
Secondary	32	27	37	29
Higher Secondary	99	98	99	99
Student-teacher ratios				
Primary	40	37	33	41
Upper Primary	36	34	31	36
Secondary	29	30	23	29
Higher Secondary	31	36	32	34

Source: NCERT, Sixth All India Educational Survey

* For student-teacher ratios, data in the first column are for government schools only.

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Notes

1.These data are from National Council of Educational Research and Training (NCERT) 1993.

2.Gross enrollment rates are defined as the percentage of students enrolled in school to the number of children of school-going age. Delayed entry and the consequent presence of over-age students result in rates that exceed 100%.

3.Education is on the "concurrent" list, which means that even though the broad guidelines and structure of education may be laid down by the Central Government, the States are free to evolve and frame their own policies and structures of education within a broad framework. Currently, approximately 89% of funding for education is state-provided, with the remaining 11% being provided by the Central Government.

4.All figures are in constant 1980-81 Rupees.

5.This literature is reviewed in Hanushek (1995).

6.This is the National Council of Applied Economic Research (NCAER)-UNDP survey of Human Development in rural India. This same data set is used for the empirical analysis reported in this section.

7.They use the PROBE data set. Findings of the PROBE team are documented in The Probe Team (1999).

8.All standard errors reported in the tables are corrected for the grouped nature of the data.

9.Sampling weights are provided in the data.

10.As discussed in Section 4.3 below, private schools are all schools that are privately managed. These include "private aided" schools which receive substantial funds from state governments.

11. The data for tuition for daughters is not significantly different from that for sons.