Private Schooling: Limits and Possibilities

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Abstract: This paper looks at the private schooling sector in Pakistan, a country that is seriously behind schedule in achieving the Millennium Development Goals. Using new data, we document the phenomenal rise of the private sector in Pakistan and show that an increasing segment of children enrolled in private schools are from *rural* areas and from middle-class and poorer families. We argue that private schools are better able to adapt to local conditions and use local labor markets in a cost-effective manner, allowing the savings to be passed on to parents through very low fees. We explore two strategies—the use of coeducational schools and the use of female teachers who are locally resident—that private schools follow to ensure low costs in the provision of education. This mechanism—the need to hire teachers with a certain demographic profile so that salary costs are minimized—defines both the possibility of private schools (where they arise, fees are low) and their limits (private schools will not arise everywhere and at all levels of education).

The 2000 Millennium Development Goals (MDGs) created a powerful global consensus to improve the development of poor countries by 2015. Central to this promise are the MDGs related to educational outcomes: (1) ensure that all children complete primary education by 2015 and; (2) eliminate gender disparities in primary and secondary education by 2005. By 2005, most countries had already fallen well behind the necessary targets to meet these goals and the second target had been missed by a large margin. These worrying trends led to renewed calls for greater public investment in schools through school construction, teacher training programs and cash transfers for children. Notably absent from the debate has been the role of private schools.

This paper looks at the private schooling sector in Pakistan, a country that is seriously off-track in achieving the MDG goals. Using new data, we document the phenomenal rise of the private sector in Pakistan and show that an increasing segment of children enrolled in private schools are from *rural* areas and from middle-class and poorer families. We argue that private schools are better able to adapt to local conditions and use local labor markets in a cost-effective manner, allowing the savings to be passed on to parents through very low fees. If replicable in other countries, the results suggest that separating the financing of education (the government) from the provision of education (through the private sector) will have large gains, without necessarily sacrificing equity.

One reason why private schools have never been seen or used as an instrument for mass education is that they typically serve the elite. In the US, 4 percent of low-income families send their children to private schools compared to 19 percent among the rich. Of parents with less than high school education, only 3 percent send their children to private schools; for parents with graduate or professional degrees, the share increases to 19 percent. Moreover, the share of private schooling is higher in tertiary and secondary education compared to primary education, by which time a large share of children from poor families have dropped out. These patterns are not unique to the US, neither are they unique to high-income countries. The share of private schooling is higher in secondary compared to primary education for the majority of the sample(Table 1) ; in the others the

difference is fairly low and is usually associated with the high state funding of private schools (Belgium, Spain, Netherlands and Chile are four such examples).[1]

In contrast, countries such as Pakistan and Zimbabwe in Sub-Saharan Africa and Lebanon and the gulf-states in the Middle East stand out, with both high private school enrollment and a larger share at the primary level. South Asian countries such as Pakistan, Bangladesh and India all show high shares of private enrollment at the primary level. A study on private education in India (Tooley, 2001, pg.13) (which has private share of 15%) recently observed that

> *"Any visitor to the 'slums' of any of the big cities in India will be struck by the sheer number of private schools—there seems to be one on almost every street corner or down every alleyway. Some of these confusingly follow what they see as an English tradition and call themselves public schools but they are wholly private in every way and are certainly not elite institutions."*

Two considerations drive our focus on Pakistan. First, the extent of private schooling in Pakistan is striking. In 2000, 35 percent of children enrolled in school at the primary level were in private schools, and this number falls by a third for middle and high schools to 25 percent. Private schooling in Pakistan at the primary level is large, widespread and increasing over time. Second, Pakistan is the only low-income country, to our knowledge, that has a high quality *census* of all private schooling facilities in the country. These data allow us to understand the structure of private schools throughout the country; the large sample size permits useful comparisons even in regions where the extent of private schooling is smaller.

Using data from the census of private schools and household surveys, we document that the *growth* in private schooling is *higher* in rural compared to urban areas and is high among the poorest segments of the population. What is equally remarkable is that these schools are overwhelmingly for-profit enterprises—they have sprung up around the country without much state regulation or subsidy. A natural question, and one that defines the possibilities and limits of private schooling, is how and to what extent for-

[1] There do not exist any clear patterns in a preliminary cross country economic analysis of prevalence of private education as country specific institutional context matters in whether private education is subsidized by the state or not.

profit schools are able to grow and cater to a wide variety of households, many of whom are drawn from the poorer segments of the population, within a market setting.[2]

We use a variety of data sources to examine this question. Data from the census of private schools provide information on school location and fees. Data from two rounds of the Pakistan Integrated Household Survey (PIHS) in 1991 and 2001 are combined to study trends in enrollments for the rich and poor in rural and urban areas. Data from the 1998 population census present a detailed picture of the extent of private school enrollment at a highly disaggregated level. Finally, data collected by the authors on the demographic composition and salary structure of close to 5000 teachers in public and private schools allow us to complete the "balance-sheet" of a typical private school.

We document that private schools are popular among the poor because they charge (very) low fees. A typical private school in a rural village of Pakistan charges Rs.1000 ($18) per year, which represents 4 percent of the GDP per capita for the country. In the US, private schools (elementary and secondary) charged $3524 in 1991. At 14 percent of GDP per capita, the relative cost of private schooling is almost 3.5 times as high in the US compared to Pakistan.[3]

At an accounting level, for-profit schools can survive with low fees only if costs are also very low. We explore two strategies—the use of coeducational schools and the use of female teachers who are locally resident—that private schools follow to ensure low costs in the provision of education. Using data on school revenues and salary structures, we show that private schools are exceptionally adept at maintaining low wages for teachers. Since wage costs of teachers constitute the bulk of educational budgets around the world, lowering wages significantly reduces the overall cost of providing education. Private schools primarily employ young, single, moderately educated and untrained local *women* and pay them relatively low wages. This mechanism—the need to hire teachers with a

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[2] These schools are not religious schools, or madrassas. A recent study by the authors (Andrabi, et. al. 2005) shows in detail that in fact contrary to popular views, religious schools play a much smaller role in Pakistan. In fact the share of religious schooling is less than one percent, lower than that in the US (check?).

[3] Private Schools in the United States: A Statistical Profile 1990-91, NCES Statistical Study, January 1995, Table 1.5.

certain demographic profile so that salary costs are minimized—defines both the possibility of private schools (where they arise, fees are low) and their limits (private schools will not arise everywhere and at all levels of education).

Understanding the evolution of the private sector for education in Pakistan has wider implications. Governments in low-income countries around the world are struggling to meet the educational demands of an ever increasing young population. In Pakistan half the population is less than 17 years old and this proportion is increasing. With less than 60 percent of children enrolled in school, there are already signs of stress. Mean student-teacher ratios in government schools exceed 40 and have been rising. School construction has slowed down and less than half of all classrooms have desks for their children.

Private schools *can* play a role in breaking these institutional constraints, and the Pakistani experience demonstrates that they can do so without catering only to the elite. This then is the possibility that private schools represent—in the villages that they choose to locate in, they are relatively cheap, used by the poorer segments of the population and reduce the considerable stress on over-burdened public schools. Simultaneously, the Pakistani experience shows that private schools are not a panacea—there are real limits to where these schools will arise and the type of education they can impart. The reasons why private schools operate at a low cost also constrains where they arise.

The remainder of this paper develops the ideas advanced here. In Section II we describe our data sources. Section III examines the growth of the private sector in Pakistan. Section IV takes a closer look at how private schools operate. We document fees and costs for private schools and examine teacher profiles and wage differentials between public and private schools. Section V discusses the limits to private schooling, focusing on the characteristics of villages where private schools locate, and where they do not. Section VI concludes with a discussion of educational policy, caveats and future research in this area.

Section II: The Country Context and the Data

Pakistan has 132 million people and is organized in a federal structure with four provinces—Punjab, Sindh, North Western Frontier Province (NWFP) and Balochistan. These four provinces along with Islamabad, the federal capital, comprise 97 percent of the country's population. Punjab is the largest province with 56 percent of the population and Sindh, NWFP and Balochistan account for 23 percent, 13 percent and 5 percent respectively. There are other regions and territories where special constitutional and legal qualifications apply. The Federally Administered Tribal Areas (FATA) with 3 percent of the population has representation in the national assembly but national laws apply only partially. The Northern Areas and Azad Jammu and Kashmir (AJK) enjoy special status and their population is not counted in population census numbers. Provinces manage the provision of education, although there are recent changes at the local government level that aim to devolve provision to the numerous districts within every province.

Educational performance is poor both in absolute terms and relative to the average income of the country. Pakistan has an adult literacy rate of 44 percent compared to 54 percent for the South Asia average, and in 2001-02, net-enrollment was 51 percent compared to 83 percent for India, 90 percent for Sri-Lanka and 70 percent for Nepal. For the country's level of income, the forecasted net enrollment rate (based on a regression of primary net enrollment on log per-capita income and the square of log per-capital income for 138 countries) is 77 percent: Pakistan's net enrollment is thus far below what one would expect for its level of income.

The problem of low overall educational performance is further compounded by large gender, income and geographical disparities. There is a 20 percentage point difference in gross enrollment rates at the primary level between boys and girls and in some provinces, notably NWFP and Balochistan, this difference increases to 40 percentage points (PIHS 2001-02). Wealth also matters: at the primary level gross enrollment rates for the top expenditure-decile is twice as high as for the lowest decile. Finally, the rural-urban divide is large with a net-enrollment ratio of 45 percent in rural areas compared to 66 percent for the urban areas. Net-enrollment ratios for rural females, at 36 percent are the lowest for any sub-group of the population.

Private education in Pakistan has a long history dating back prior to independence. Limited data suggest that private schools catered to a niche market restricted to the big cities from 1947-1972. The market for private schooling was dominated by missionary-run schools (or local schools imitating the missionary model), mainly used by the elite. In 1972, private schools were nationalized amidst a government program of nationalization of all industry. The policy was reversed in 1979. Private schools were allowed to open and the schools taken over by the government were gradually returned to the original owners. However, government policy towards private schools was and still is one of *laissez affaire*—there are no subsidies in the form of grants to parents or schools (as in Bangladesh, the Philippines or India) so that private schools arise and survive purely as a market based phenomenon.

The Data

We use four primary government data sources and data from a comprehensive educational survey exercise, LEAPS, collected by the authors. The government datasets used are the 1998 Census of Population (PC), the Punjab Educational Management Information Systems (EMIS), the Census of Private Educational Institutions in Pakistan (PEIP) and the Pakistan Integrated Household Surveys (PIHS). Appendix 1 documents the characteristics of each of these sources; in brief, the Census of Population provides information on village level attributes for every village in Pakistan. The PEIP is a census of private schools conducted by the Federal Bureau of Statistics in 2000 that provides information on all private schools in the country. The EMIS is information on public schools; due to data limitations we use the EMIS only for Punjab province (more on this below). Finally, the PIHS is a household survey carried out in 1991, 1998 and 2001. We use the 1991 and 2001 rounds to examine the growth of private schooling across provinces, the rural/urban divide and across income groups. We use the 1998 round to look at enrollment differences between the rich and the poor in villages with and without private schools.

These data were linked through an extensive matching process so that school level attributes could be examined in conjunction with village level data such as population and village infrastructure. The matching between the population census, PEIP and the

PIHS was perfect as they were collected by the same agency and had numerical village level identifiers. The EMIS data was collected by the provincial government and had a different coding scheme. To match these data at the village-level we used text-matching algorithms followed by a manual match. This process allowed us to match 85 percent of the schools in the EMIS database with the census; for these villages, we then have complete data on both village-characteristics and the existence of public and private schools; to our knowledge, such combined datasets are currently unavailable for any other country in South-Asia.[4]

Finally, data on teacher profiles and wages were collected in 2004 as part of an ongoing project—Learning and Educational Achievement in Punjab Schools (LEAPS). A unique characteristic of this data is the sampling frame. The project explicitly looks at issues of school choice in rural Punjab and the sample was constructed in two stages. In the first stage, we stratified the province in three regions—North, Central and South, and chose one districts from each of the 3 stratifications. In the second stage, we drew villages randomly in each of these districts from a list frame of villages with at least one private school. Across the 3 districts, our final sample consists of 4880 teachers interviewed in 800 schools in 112 villages. The sampling-frame allows us to examine variation in teacher's wages across public and private schools *in the same village*, thus abstracting from differences due to geography, labor market segmentation or other village specific features (Appendix 1 provides comparisons of these villages with others in the province). As with the matched data on village level characteristics and school-location, we believe that this is the first dataset in South Asia that provides information for a large number of private and public school teachers with detailed information on demographics and salary structures.[5]

Section III. The Rise of Private Schooling

In two related papers, Jimenez and Tan (1985, 1987) examined the role of private education in Pakistan. Based on a school mapping exercise conducted in 1983, the authors noted a large increase in the number of private schools after denationalization,

[4] The problem is somewhat complicated since there is no standardization of transliteration of village names into English. The same village names can be spelled quite differently in the two data sets.
[5] In India Kingdon (1996 and 1998) studies teacher pay in public and private schools for 30 schools in an urban area.

leading to substantial cost savings for the government in the provision of education. The authors also noted (cautioning that the available data did not allow for an unambiguous statement) that despite the growth in private schools, educational institutions still did not service large proportions of the country's population; particularly troublesome was the exclusion of girls in rural areas. Based on tuition and other fees in private schools, Jimenez and Tan (1987) also argued that private schools seemed to be catering only to the rich. They concluded that the private education sector would reach "full-capacity" at an enrollment of 2.1 million children. What has been Pakistan's experience since then?

The Experience of the Nineties

Fifteen years after Jimenez and Tan's assessment, there are *6.3 million* children enrolled in more than 36,000 private institutions in Pakistan. From the 3,300 private schools in the four big provinces (Punjab, Sindh, NWFP and Balochistan) in 1983, there were 32,000 such schools in the same four provinces in 2000—an almost ten-fold increase in less than two decades. Most of the enrollment in these private schools is at the primary level, accounting for 75 percent of the total enrollment in private schools. Thus, 18 percent of those in the 5-10 age-groups were attending private schools in 2000 and this number drops to 4 percent for those in high-school (Figure 1). Since not all children in the relevant age-groups are enrolled in any school, this accounts for 35 percent of public enrollment across primary, middle and high schools.

Most of the growth in the setting up of private schools happened during nineties (Figure 2). From the PEIP data, the median year of formation for a private school that was functional in 2000 is 1996; 22 percent of schools in 2000 were formed in 1998 and 50 percent were less than 4 years old (formed on or after 1996).[6] While the majority of existing schools formed before 1990 were urban, since then, there has been a qualitative

[6] Interpreting these figures as the *growth-rate* of private schools in recent years is problematic since data on the age of schools *currently* existing does not yield information about school survival rate. If, over a 3-year span, 1000 schools were set up each year but 500 shut down a year later, a survey after three years would report 125 schools aged 3 years, 250 schools aged 2 years, 500 schools aged 1 year and 1000 schools established in the current year. The difference in these numbers is due to the school survival rate rather than the growth of schools. To some extent we can separate the joint effect of school formation and school survival rates through a simple exercise based on data from 1983: In 1983, there were 3300 private schools in the four provinces. In contrast, the current census indicates that by 2000 there were 1,764 private schools formed in 1983 or before in these provinces, suggesting that a bit over half the schools survived over the 17-year period i.e. an implied *annual* survival rate of 96.4%. Discounting the numbers that Figure 2 is based on by the survival rate still yields substantial growth in private schools during the 90s.

shift in the formation of schools with a steady increase in the rural/urban ratio till 1996, followed by a leveling off. Since 1996 onwards, an equal number of private schools were set up in rural and urban areas every year and in 1999, there were *8,000 new* private schools setup in Pakistan, almost half of which were in rural areas.

The dramatic increase in the formation of private schools translated directly into greater enrollment and an increase in the share of enrolled children for private schools. Household-level data from the PIHS household-level data show a consistent increase in the share of private schooling in total enrollment for the four main provinces, although their specific experiences varied: Punjab and NWFP showed the largest increases (from 15 to 30 percent and 4 to 17 percent respectively) while the growth in Sindh (16 to 21 percent) and Balochistan (4 to 6 percent) was less.

These increases happened in both rural and urban areas, and for both the rich and the poor. For the poorest decile of per-capita expenditure in rural areas, the share of private schools increased from 0 to 6 percent; for the richest rural deciles the share jumped from 12 to 38 percent. Urban areas reported equally high growths, although from a higher level. For the poorest deciles, the equivalent increase was from 9 to 18 percent and for the richest from 52 to 85 percent. By the end of the nineties, nearly all rich Pakistani children in urban areas, almost a third of the richer rural children and close to 10 percent of children in the poorest deciles nationally were studying in private schools.

Figures 3 and 4 examine this change using growth enrollment curves. To construct these figures, we computed changes in private and public enrollment for every decile based on household consumption expenditure from the PIHS. The horizontal axis in these two figures shows the relevant deciles where 1 is the poorest and 10 the richest. The vertical axis then shows the *change* in enrollment (Figure 3) and the *growth* in enrollment (Figure 4) for the relevant decile. The change is defined as the difference between the 2001 and the 1991 enrollment figures ($Enr_{2001} – Enr_{1991}$) and the growth as the change normalized by enrollment ($(Enr_{2001} – Enr_{1991})/Enr_{1991}$).

While *changes* in private school enrollment were higher among the rich, growth has been greater among the poor, largely because they started from very low levels. Nationally, there was a 30 percent increase in private school enrollment and a 20 percent decline in public school enrollments among the richest deciles—this pattern is accentuated in urban and somewhat attenuated in rural areas (Figure 3). In sharp contrast, enrollment growth rates in the private sector were highest among the poor (close to 300 percent) and lower among the rich (150 percent); indeed, the highest growth rates were among the middle-income groups in rural areas (close to 400 percent). There was a decline in public school enrollment growth rates, both across urban and rural areas and across the rich and the poor (although the declines were more marked for the rich).

Whether changes or growth rates are a better measure for long-term prediction depends on the underlying model. If the poor continue to grow faster than the rich, eventually they will catch-up. On the other hand, if there are greater constraints on access and affordability for the poor, the long-run ceiling could be a lot lower. If so, differences between the rich and poor will persist in the long-run.

The use of private schools by different segments of the population in Figures 3 and 4 confound villages with no private schools (and lower enrollment in private schools) with villages where private schools exist. If private schools systematically locate in richer villages, the use of private schools by the poor *in villages where such schools exist* is understated. One way to get at the use of private schools in different types of villages is to match the data from the household survey (PIHS) with data from the census of private schools.

Table 2 divides all villages into those with and without private schools and compares enrollments across the rich and poor across these villages (note that even in villages without private schools, parents can send their children to private schools outside the village). Several features of this comparison are noteworthy. First, as expected, private school enrollment is higher in villages with private schools, and increases with household income. In all four provinces, the share of private enrollment is *twice as high* in villages with private schools compared to those without: in Punjab, for instance, in villages with

private schools, 23 percent of enrollment is in private schools compared to 11 percent in villages without. Second, the relationship between enrollment in private schools and poverty in Figures 3 and 4 reflects both the prevalence of private schools and their relative use by different income groups. When there are private schools in the village, a sizeable fraction of the poor tend to use them: continuing with the experience in Punjab, in villages with private schools, the share of private schooling in total enrollment for the *poorest* one-third is 17 percent and among the richest one-third 34 percent. Remarkably, *the fraction of enrollment for the poor in villages where there are private schools is the same as the rich in villages where they are not.*

Third, the existence of private schools is strongly associated with greater female education: in both Punjab and NWFP, villages with private schools show a large improvement in overall female enrollment than those without. One dramatic impact of the penetration of private schools is that there is a smaller gender gap in private school enrollments across the country—we will argue later that this is partly due to their policy of coeducation as opposed to sex-segregated schools in the public sector. The share of female enrollment in private schools is consistently 3-5 percentage points higher in the latest educational data from all available sources.[7] This is consistently true across rural and urban areas and corroborated with other data sets such as the PIHS.

These results suggest that there are large differences between villages with and without such schools—clearly, in villages where such schools exist, a host of educational indicators show an improvement compared to those where they don't. The next two sections examine this dichotomy in greater detail.

Section IV. The Possibilities of Private Schools: Fees and Costs

Alderman and others (2001) document that private school fees (Rs.85/month) are affordable even for the poor in urban regions of Pakistan (Quetta and Lahore). Although the rich use private schools more than the poor, Alderman and others (2001) find that even among households in the two lowest income brackets, a majority of children use private schooling facilities. Alderman's findings, in terms of the cost of private schools as

[7] The difference using the PEIP census and EMIS numbers is 37 percent vs. 42 percent in 1999-00 and 40 percent vs. 44 percent in PIHS 2000 data.

measured through annual tuition fees, appear to hold more generally for all the provinces in Pakistan, as well as for rural and urban regions within each province.

Table 3 shows two characteristics of private school fees.[8] *First*, the median school fees in Pakistan are low: the highest median school fee in urban areas is in Balochistan, and amounts to Rs.1740.98 per annum. For rural regions, this drops down to Rs.1351 per annum. Punjab, with more than 50 percent of the school going age population, reports the lowest fees both in the urban and the rural regions (Rs.850 per annum and Rs.632 respectively). Household expenditure data from the PIHS provide a sense of the magnitude of these fees: In Punjab, the mean tuition fee represents 1.7 percent of average household expenditure in rural and 2.1 percent in urban areas. Thus a family with 4 children in an urban area will have to spend 8.4 percent of their household budget on school tuition fees in the average private school.[9]

Second, the consistently higher mean compared to the median suggests that the distribution is skewed, with a high concentration of schools around lower school fees. The inter-quartile range, which shows the range of fees between the schools at the 75th and 25th percentiles of the fee distribution, bears this out. The maximum inter-quartile range is Rs.1200: in rural regions, 50 percent of all schools are concentrated in a tight band ranging from Rs.900 to Rs.1500. Further, it appears that provinces with more schools tend to report a lower median fee, as well as a tighter distribution around the median.

That private schools have managed to keep their fees low and still stay solvent (In Footnote 5 we estimated a 95% annual survival rate) without any subsidies, especially in rural areas, is quite remarkable. How have they managed to do so?

Why are Fees in Private Schools Low: Economies of Scale, Teacher Demographics and Teacher Salaries

[8] We eliminate a small number of NGO schools that are subsidized by donors and may charge lower fees.
[9] Note that total expenditure in schooling includes more than just tuition fees and these numbers do represent an underestimate.

Conditional on locating in a village, two factors related to the local structure of demand and labor market conditions drive low costs in private schools. *First*, the vast majority of private schools are coeducational, thus increasing the effective population they serve while maintaining low initial setup costs. *Second*, private schools maintain very low wage costs by hiring less qualified female teachers who are young and live in the same village where they work.

Private Schools are coeducational

A common wisdom in Pakistan is that girls will not go to school unless schools are single-sex. As Gazdar (2001) points out, this wisdom is not borne out by attitudinal surveys of parents towards primary schooling or systematic evidence from any part of the country. In fact, in certain cases, a large number of girls have started attending boys' primary schools when allowed to do so—distance seems to be a larger factor for non-enrollment in primary schools, rather than the presence (or not) of a segregated school.

The experience from private schools suggests that coeducation is possible, at least at the primary levels, and indeed, profitable not only in cities but also in rural areas. More than 92 percent of private schools in both rural and urban areas of Pakistan are coeducational. They are coeducational not only in the less conservative provinces such as Punjab (94 percent), but also in provinces with lower human-development indicators and typically more conservative attitudes, such as NWFP (88 percent) and Sindh (90 percent).[10]

Why is coeducation important? Consider the decision to setup a private school. The profits of the private school, which derive almost entirely from student fees, depend on the total number of students that the private school is able to attract. In related work, we show that the single largest factor that affects the choice of school and whether to attend a school or not is distance, and that the effects of distance from school are magnified for girls compared to boys.

[10] What about government schools? While theoretically they are *all* single-sex, in practice some government schools do permit coeducation as well. The LEAPS data suggests that such practices are highly uncommon. By comparing the gender composition of government and private schools for attending Class III students (and classifying a school as coeducational if there is *any* mixing in Class III), we find that 86 percent of all private schools are coeducational compared to only 17 percent of public schools, a difference that is statistically significant.

Figure 6 shows the effect of distance in the villages where we completed the LEAPS survey. We divided every village into “settlements” using geographical markers and delineated 215 settlements in the 112 villages. The figure shows male and female enrollment in settlements with and without government and private schools. There is a 20 percentage point increase in male enrollments moving from settlements with no schools to those with both public and private schools; the 30 percentage point increase for female enrollment (which is lower for every category) is even more impressive.

Table 4 replicates results from Andrabi and others (2005b), where we look at the effect of the presence of schools on enrollment in a multivariate regression context. The results are very similar to the raw percentage differences—in settlements without schools, there is a 22 percentage point decline in enrollments for boys and an additional 6 percentage point decline for girls (Column 1). Further, when there is no school around, households that are poorer (Column 2) and houses where the household head is illiterate suffer an additional penalty of 1.5 and 4.7 percentage points respectively.

Given the paramount importance of distance in the enrollment decision, a single-sex private school restricts the available pool of enrollees in the school; in contrast, a coeducational school doubles the number of children that the school can draw from, while maintaining the same physical location. Since most private schools are located in the residence of the entrepreneur, this sharply reduces costs by obviating the need for a separate location and minimizes the fixed-costs of setting up a school.

Simultaneously, two complementary techniques—the use of “local” teachers and the use of female teachers—help make coeducation more acceptable for parents in private schools. Table 5 presents the demographic profiles of public and private school teachers using data on 4,890 teachers collected as part of the LEAPS study. There are several interesting and sharp contrasts. First, private schools hire mostly female teachers. Among private schools 76 percent of all teachers are female compared to 44 percent in government schools. Second, private schools create a “neighborhood-school” environment by hiring local teachers who live where they work; 52 percent of the teachers in private schools work in the village where they were born compared to 23

percent in government schools. The LEAPS teacher questionnaire shows that two-thirds of third grade teachers in private schools lived within 15 minutes walking distance from the school. The corresponding percentage for government school teachers is about half as much.

Lowering Wage Costs

Hiring female teachers also helps in driving down the wage bill. The difference in pay between a teacher in a private and a government school is staggering. Figure 7 shows that an average female teacher in a government school earns Rs.5897 per month, which is not very different from the earnings for an average male (Rs.6408). Among private schools though, male teachers earn Rs.1789 per month (almost one-third!) while females earn only half as much at Rs.1069.

These differences confound the very different profile of government and private school teachers (and males and females) with a pure "gender" differential. As Table 5 shows, teachers in private schools differ from those in government schools in systematic ways: they are younger and less experienced, less likely to be married, less educated, less trained and more from the immediate vicinity of the school. How much of the female penalty in wages is due to variation in the level of education and experience between male and female teachers?

In a multivariate regression context (Table 6) controlling for education, educational training, teacher origin and experience of the teacher, the female penalty remains strong in private schools, and virtually vanishes in government schools. Figure 7 provides the graphical representation of the result. Controlling for education, experience, training and origin of the teacher, we find that female teachers earn on average Rs.5653 compared to Rs. 5891 in government schools. In private schools, the gender penalty is virtually unchanged even after adjusting for teacher characteristics. (Rs. 1015 for females vs. Rs.1749 for males) As Table 6 shows, these results are not driven by differences across villages. Since the LEAPS data is based on a sampling scheme that guarantees multiple schools in every village, we can also look at the difference among teachers *in the same*

village. Strikingly, there is no difference in the predicted difference for private schools. The estimated coefficient on the female-private interaction is in the range -.35-.36 in all the specifications. This translates to approximately Rs.730, when we control for village literacy and wealth (col.2 in Table 6) and even when we control for village fixed effects and estimate within villages (col. 3 in Table 6). This suggests that the difference captures a pure "gender" difference rather than other variables related to overall labor market conditions.

Hiring local teachers also helps in controlling costs in terms of wages. Figure 8 is similar to Figure 7. It shows the predicted value of wages from regressing (log) wages on teacher gender, education, experience and interacting teacher origin with school type—public or private. Local teachers are paid less in government schools, but there is a large additional decline for private schools: there is more than 30% (Rs.1406 vs. Rs.965) discount for hiring local vs. non local teachers, controlling for other observed characteristics.

The data from the LEAPS survey is corroborated by data from the wider labor market beyond that of teachers. Wage differences between men and women in Pakistan are staggering. Analysis based on household surveys show that men receive four times as much as women when they have primary education and two times as much when they have secondary education (World Bank 2005). That educated women cost less is in large part due to different constraints on labor mobility of men and women. While men can (and often do) travel outside their residential areas to pursue employment opportunities, cultural constraints and issues of safety restrict work options for women to the settlement that they live in (World Bank 2005).

The private educational sector has turned this cultural constraint into a cost advantage. In rural areas educated women are a captive resource, and as long as schools are not located far from their residence, private schools can be staffed at relatively low costs. This flexibility—the ability to see an opportunity where others see a constraint—in large part accounts for the success of the private educational sector in Pakistan.

When private schools choose to locate in rural areas (and a considerable number are already doing so), they manage to keep the fees low, attract poorer students (along with rich ones) and maintain a much needed gender balance in enrollments. The results beg the question of where private schools locate—what if any are the limits to private schooling.

Section V. Where do Private Schools Locate: The Limits to Private Schooling

That there are limits on where private schools will go is evident in Figure 5. We mapped the penetration of private schools throughout Pakistan using data from the 1998 population census, which is representative at the district/rural-urban level. Despite the extensive growth in private schooling, parts of the country are still sparsely served. Punjab appears to be the heartland of privately provided education—none of the 34 districts in the province report private schooling shares less than 10 percent; almost half report shares between 20 and 30 percent and a significant portion report shares above 30 percent. In contrast, the penetration of private schooling is lower in Sindh and Balochistan. There are swathes of these two provinces where private school enrollment shares are below 10 percent and very few districts where it exceeds 30 percent. Using information from the population census and the census of private schools (PEIP), we created a complete village database of village characteristics and the existence of a private school for the entire country. This allows us to look at village level variables that contribute to increasing the likelihood of a private school. Two village characteristics stand out.

Private Schools Locate in Larger Villages

Private schools are set up in villages with bigger populations and better infrastructure across the four provinces (Table 7). Villages where there are private schools are located are roughly twice as large in terms of population (4463) than the average village (1975). Private schools are also set up in villages where the infrastructure is better. Villages in all four provinces with private schools tend to have a larger fraction of houses with electricity. For the country as a whole, 73 percent of houses report an electricity connection in villages where there are private schools compared to 48 percent in villages where they are not. The same pattern repeats for piped water supply. A plausible measure

of village wealth is the fraction of houses with *pakka* (permanent) construction rather than mud or thatch. The average fraction of *pakka* houses in a village with private school is 60 percent compared to 40 percent overall.

Private Schools Locate where there are Public Schools

Recall that private schools maintain low costs by overwhelmingly hiring single females who belong to the same village. In rural Pakistan, women rarely move across villages for economic or employment based reasons (World Bank 2005 Gender Assessment). When women *do* move, the single largest reason is marriage. However, married women seldom work outside the home in the formal labor market. The lack of mobility of women who are willing-to-work women allows private schools to capitalize on a captive low wage labor pool *as long as they locate in villages where there are at least secondary educated women*.

This suggests a positive correlation between the stock of educated women in a village and the existence of a private school. We test that prediction. At the Punjab village level, in a regression of number of private schools on village population (larger villages have more private schools) and proportion of females that are educated beyond eight years of schooling, increasing the percentage of educated females by one standard deviation increases the number of private schools in a village by .51 of a standard deviation.

The EMIS data also tells us what year each village in the Punjab received a government school. We merge these different data sets and show in Table 8 that pre-existing government secondary schools for girls increases the pool of educated women and the likelihood of a private school. The number of educated women is more than twice as high in villages with pre-existing secondary schools and rises by about 50% even as a proportion of total women in the village. The likelihood of having a private school in a village more than doubles (11.57% to 30.79%) when a village has both a primary and a secondary girl's school. This raises an interesting point about the complementarity of public and private schools. Private schools arise mostly where the government set up secondary schools in the last twenty years.

Private schools have effectively used less educated, low paid young women to serve as primary grade teachers. This formula for success at the primary level may not be replicable at the secondary and the higher secondary level. The skill and the educational level required to teach properly at the higher grades is not available at the local level in most villages in Pakistan. To expand to this level, teachers from outside the villages will have to be drawn upon to teach, which can only happen if they are given competitive salaries. Thus the affordability of private schools stemming from the low labor costs will be compromised. The spread of private schools, therefore, is constrained both geographically—they will first come up in villages where there is a ready stock of educated women—and vertically by the availability of trained teachers at the local level.

Section V: Discussion, Caveats

The debate between private and public schooling concentrates mostly on substitution between private and public enrollment, where increasing enrollments is seen as eating into the share of the other. While the two are indeed alternate sources of education and hence substitutes at any given time, Pakistan's case adds a temporal dimension, introducing a *complementarity* between the two sectors. Girls educated in today's public schools will become teachers in tomorrow's private schools. Viewed in this light, a first priority should be the development of a cohort of educated women in every village who can then serve as catalysts in the process of educational reform. This dynamic complementarity between the public and private sector suggest that a first large investment, a "Big Push" in creating cohorts of educated women could then lead to self-sustaining growth in educational provision through the use of private schools. Alternatively, to alleviate the constraints of low cost teachers, it has to become easier for women from the outside to break into the village labor market. Educational policy in Pakistan needs to take into account the segmented nature of labor markets and the dynamic complementarity that exists between public and private schools.

Our focus on the supply constraints to education and the central role of women as teachers is not new. In the US there has been an extensive debate about the relationship between changing educational quality and the exit of women from the teaching profession. Two reasons—the opening up of alternative employment options and

increased unionization—have been advanced as potential explanations for this compositional change in the teaching workforce. As the labor force participation of women in Pakistan increases, it is likely that similar patterns will emerge. Pakistan at this stage presents a fascinating glimpse of an environment that many higher-income countries witnessed fifty years ago.

There are certain fundamental questions left unanswered in our paper. Why do people send their children to private schools? Is it because there is a perceived or actual quality difference between public and private schools? Can poor illiterate parents judge the difference between a good and a bad school? How do parents make decisions when offered more schooling choices? Answering these questions is essential because any educational policy that expands the educational space and does not take into account this dynamic of school choice is subject to essentially a version of the "Lucas " critique where the parental reaction to any policy could lead to serious policy ineffectiveness.

The second big question that we have left unanswered is that of equity. There is a growing concern in Pakistan that private education leads to the emergence of two classes—the English medium trained elite and the vernacular Urdu medium taught masses. This point has been raised numerous times in the popular press, by academics and by populist politicians.[11] We don't answer this question fully but LEAPS and the PIHS data can shed some light on this. The rise of private schooling in the rural areas is likely to bring rural and urban areas closer in terms of quality education, and at the same time increasing disparities within rural and within urban areas.[12]

Finally, our analysis is mainly at the level of correlations and while our causal story is quite plausible, it is not established rigorously. Future work in this area should proceed both on the lines of examining quality issues in private education, the interaction of private and public schooling as well as rigorously showing causality of the linkages mentioned in this paper.

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[11] See Najam (1998), and The News, March 24, 2003 report on Imran Khan's views on education,. http://www.jang.com.pk/thenews/mar2004-daily/23-03-2004/metro/k11.htm

[12] The last though is true only if the Besley-Coate mechanism of poorer children coming into government school when rich go to private does not work. We are not sure about this.

Figures and Tables

TABLE 1

SHARE OF PRIVATE SCHOOL ENROLLMENT, 2000

Country	Primary (%)	Secondary (%)	**Country**	Primary (%)	Secondary (%)
Ghana	6.31	5.82	Nicaragua	16.01	35.00
Canada	6.48	6.38	Hungary	16.53	42.56
Nepal	6.57	15.91	Croatia	17.00	86.00
Saudi Arabia	6.57	6.28	Germany	2.39	6.86
Costa Rica	6.89	13.23	Colombia	18.75	30.08
Ireland	7.02	5.37	Guinea	19.39	12.75
Philippines	7.27	22.67	Argentina	19.92	25.09
Mexico	7.74	16.35	Ecuador	22.67	24.64
Benin	7.96	17.51	Mauritius	23.94	72.68
Romania	8.00	54.00	Australia	27.22	23.86
Brazil	8.33	11.27	Vietnam	28.00	11.38
Bolivia	8.44	15.63	Trinidad and Tobago	28.49	6.21
Belarus	9.00	6.00	Chad	29.55	14.91
Czech Republic	9.00	6.33	Bulgaria	31.00	7.00
Eritrea	9.33	5.95	Spain	33.43	29.08
Panama	9.89	15.69	Pakistan	35.00	25.00
Portugal	9.96	13.58	Ukraine	36.00	25.00
Senegal	11.16	25.64	Bangladesh	38.69	95.73
El Salvador	11.17	23.03	Chile	45.46	49.70
United States	11.58	9.65	United Arab Emirates	46.52	33.66
Burkina Faso	11.70	34.41	Kuwait	47.00	38.00
Slovenia	12.00	2.07	Japan	51.00	7.00
Peru	13.01	16.88	Belgium	54.41	57.84
Thailand	13.24	6.65	Lebanon	63.63	51.06
Uruguay	14.00	11.81	Armenia	65.00	51.00
Dominican Republic	14.38	22.90	Netherlands	68.35	83.56
Venezuela, RB	14.43	25.82	Tunisia	77.00	7.64
France	14.57	25.10	Poland	86.00	5.00
Paraguay	14.76	27.60	Iran, Islamic Rep.	91.00	47.00
India	15.86	42.70	Jamaica	91.00	18.58
			Latvia	92.00	1.00

Source: Edstats, The World Bank, Washington, D.C.

TABLE 2

PRIVATE SCHOOL ENROLLMENT

COMPARING VILLAGES WITH AND WITHOUT PRIVATE SCHOOLS

	Punjab		**Sindh**		**NWFP**		**Balochistan**	
	Villages w/ Private School	Villages w/o Private School	Villages w/ Private School	Villages w/o Private School	Villages w/ Private School	Villages w/o Private School	Villages w Private School	Village w/o Private School
% enrolled	61	46	40	31	55	42	56	41
% f enrolled	56	35	28	20	41	24	50	26
% m enrolled	67	55	54	42	68	59	65	54
private as % of enrollment	23	11	5	2	16	5	7	1
public as % of enrollment	75	87	90	97	83	93	91	98
private as % of enrollment among the POOR	17	06	3	0	6	3	0	0
private as % of enrollment among the MIDDLE	18	11	6	2	11	3	8	1
private as % of enrollment among the RICH	34	18	5	5	24	8	6	2

Source: PIHS 1998, PEIP 2000

TABLE 3

ANNUAL FEES FOR SELF-OWNED (FOR-PROFIT) PRIMARY SCHOOLS

Province		**Median**	**Mean**	**Standard Deviation**	**Inter-quartile range**	**Number of Schools**
NWFP	Urban	1342.85	1688.56	21658	914.39	533
	Rural	1200	1367.71	1551.57	649.83	1,165
PUNJAB	Urban	850	1286.94	3331.34	661.13	4,201
	Rural	632.21	762.72	931.16	423.64	3,955
SINDH	Urban	1297.18	19562	3375.17	1175.33	1,290
	Rural	1142.97	1014.47	537.8	661.2	84
BALOCHISTAN	Urban	1740.98	2095.64	2327.21	1200	61
	Rural	1351.36	1308.78	732.26	526.67	34

Source: PEIP 2000

TABLE 4
MARGINAL PROBIT OF PRIVATE SCHOOL ENROLLMENT ON SETTLEMENT, HOUSEHOLD AND CHILD CHARACTERISTICS

	(1) Enrolled in Private School	(2) Enrolled in Private School	(3) Enrolled in Private School	(4) Enrolled in Private School
Age	-0.04324	-0.04334	-0.04351	-0.04133
	[0.00340]***	[0.00341]***	[0.00342]***	[0.00343]***
Age Squared	0.00088	0.00085	0.00086	0.00073
	[0.00017]***	[0.00017]***	[0.00017]***	[0.00017]***
Illiterate Head	-0.11557	-0.10859	-0.10784	-0.10082
	[0.00280]***	[0.00283]***	[0.00285]***	[0.00287]***
Monthly Expenditure: Rs. 2500-5000		0.03623	0.03610	0.02937
		[0.00340]***	[0.00342]***	[0.00343]***
Monthly Expenditure: >Rs. 5000		0.10460	0.10537	0.10115
		[0.00447]***	[0.00450]***	[0.00452]***
Female			0.00478	0.00051
			[0.00290]*	[0.00291]
Only Government (in Set)				-0.11594
				[0.00615]***
Government and Private School				0.08744
				[0.00346]***
Observations	100825	100480	99377	98853
Pseudo R-squared	0.04	0.04	0.04	0.06

Robust standard errors in brackets

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

Notes: Calculated from LEAPS 2005 Census. Observations are all enrolled children ages 5 to 15. Omitted categories are: household has literate head, monthly expenditure is below Rs. 2500, child is male, and no school in settlement.

TABLE 5

TEACHER CHARACTERISTICS

PUBLIC AND PRIVATE SCHOOLS

		Public (Mean)	Private (Mean)	t-value (Difference of Means)
(log) Salary		8.63	6.99	106.92
Gender	(%Male)	57.08%	23.77%	24.73
Age	(years)	38.6	25.2	57.6965
Marital Status	(%Single)	14.52%	77.12%	-22.63
Origin	(%Local)	25.34%	52.15%	-19.88
Education	Matric and below	35.51%	41.43%	-4.21
	FA/FSc	19.32%	36.08%	-13.29
	BA/BSc	26.19%	18.80%	6.09
	MA/MSc	18.98%	3.69%	16.65
Training	No Training	6.40%	71.46%	-63.01
	PTC/JV/SV	43.79%	14.57%	22.57
	CT	22.20%	7.67%	13.76
	BEd and above	27.61%	6.30%	19.44
Teaching Experience	< 1 year	6.38%	21.20%	-15.56
	1-3 years	5.17%	39.03%	-31.91
	> 3 years	88.45%	39.77%	41.48

Source: LEAPS 2005

TABLE 6
HOW ARE PRIVATE SCHOOLS DIFFERENT?
DETERMINANTS OF TEACHER (LOG) WAGES

	(1)	(2)	(3)
Private	-0.89970	-0.90367	-0.95137
	(0.02577)***	(0.02576)***	(0.02558)***
Female	-0.02660	-0.03274	-0.02111
	(0.01701)	(0.01707)*	(0.01662)
Private*Female	-0.36592	-0.36476	-0.35069
	(0.02855)***	(0.02863)***	(0.02823)***
Local	-0.15578	-0.16370	-0.12629
	(0.01387)***	(0.01402)***	(0.01443)***
Education: FA/F.Sc	0.14318	0.14365	0.13051
	(0.01716)***	(0.01714)***	(0.01666)***
Education: BA/B.Sc	0.31310	0.31511	0.29734
	(0.02135)***	(0.02133)***	(0.02073)***
Education: M.A or more	0.47406	0.47318	0.48265
	(0.02879)***	(0.02876)***	(0.02780)***
Training: PTC/JV/SV	0.35588	0.35136	0.34586
	(0.02069)***	(0.02072)***	(0.02024)***
Training: CT	0.25027	0.24581	0.25202
	(0.02480)***	(0.02482)***	(0.02415)***
Training: B.Ed or more	0.33309	0.32766	0.32414
	(0.02801)***	(0.02805)***	(0.02710)***
Experience 1-3 Years	0.18982	0.18718	0.17073
	(0.02299)***	(0.02297)***	(0.02237)***
Experience >3 years	0.39473	0.39176	0.38545
	(0.02138)***	(0.02137)***	(0.02095)***
Constant	7.82429	7.76826	8.08058
	(0.02717)***	(0.03312)***	(0.06308)***
		w/village characteristics	w/village fixed effects
Observations	4606	4606	4606
R-squared	0.81	0.81	0.83

Omitted categories are Education: Matric and below, No Training, Experience < 1 year
Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 7

VILLAGE ATTRIBUTES

VILLAGES W/ AND W/0 PRIVATE SCHOOLS

		NWFP		PUNJAB		SINDH		BALOCHISTAN		PAKISTAN	
		Villages w/private schools	**All Villages**	**Villages w/private schools**	**All Villages**	**Villages w/private schools**	**All Villages**	**Villages w/private schools**	**All Villages**	**Villages w/private schools**	**All Villages**
Population	Mean	6101.92	2055.69	4050.63	2059.68	4921.43	2698.97	4038.44	830.91	4463.32	1975.06
	SE mean	158.79	39.11	54.24	16.13	301.77	39.65	692.58	21.11	53.69	12.90
	N	1238	7175	5253	24568	388	5780	63	6014	6990	43657
Adult Literacy rate	Mean	0.38	0.27	0.45	0.37	0.26	0.22	0.28	0.14	0.43	0.31
	SE mean	0.004	0.002	0.002	0.001	0.007	0.002	0.019	0.002	0.002	0.001
	N	1237	6911	5252	24273	386	5695	62	5119	6985	42117
Fraction Houses pakka	Mean	0.54	0.56	0.65	0.49	0.18	0.13	0.08	0.08	0.60	0.40
	SE mean	0.009	0.005	0.004	0.002	0.011	0.002	0.014	0.003	0.004	0.002
	N	1238	7175	5253	24538	388	5779	63	6006	6990	43618
Fraction Houses with water	Mean	0.268	0.171	0.125	0.087	0.130	0.102	0.320	0.053	0.153	0.098
	SE mean	0.008	0.003	0.003	0.001	0.010	0.002	0.047	0.002	0.003	0.001
	N	1238	7175	5253	24538	388	5779	63	6006	6990	43618
Fraction Houses with electricity	Mean	0.741	0.470	0.762	0.566	0.407	0.424	0.539	0.217	0.737	0.484
	SE mean	0.008	0.005	0.003	0.002	0.017	0.004	0.055	0.005	0.003	0.002
	N	1238	7175	5253	24538	388	5779	63	6006	6990	43618
Average Household Size	Mean	8.06	7.81	6.99	6.83	5.56	5.46	6.23	6.35	7.09	6.74
	SE mean	0.041	0.021	0.012	0.007	0.045	0.012	0.237	0.028	0.014	0.007
	N	1238	7175	5253	24538	388	5779	63	6006	6990	43618
Village Area	Mean	3807.25	2772.29	2109.47	1644.21	8337.38	4568.50	3914.36	2629.20	2746.59	2299.24
	SE mean	198.694	87.287	43.396	18.653	659.896	112.138	800.759	82.207	62.869	24.668
	N	1055	3773	5127	24742	387	5852	31	3902	6648	38401

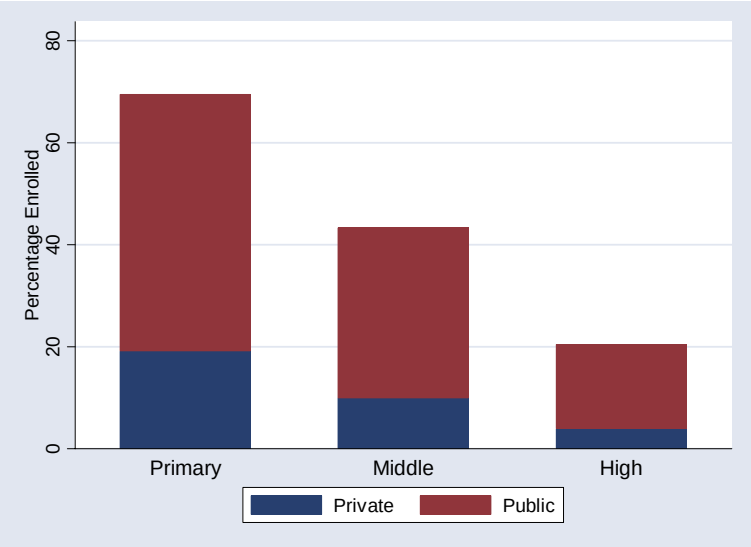
Source: Population Census 1998, PEIP 2000

TABLE 8

PUBLIC-PRIVATE COMPLEMENTARITY

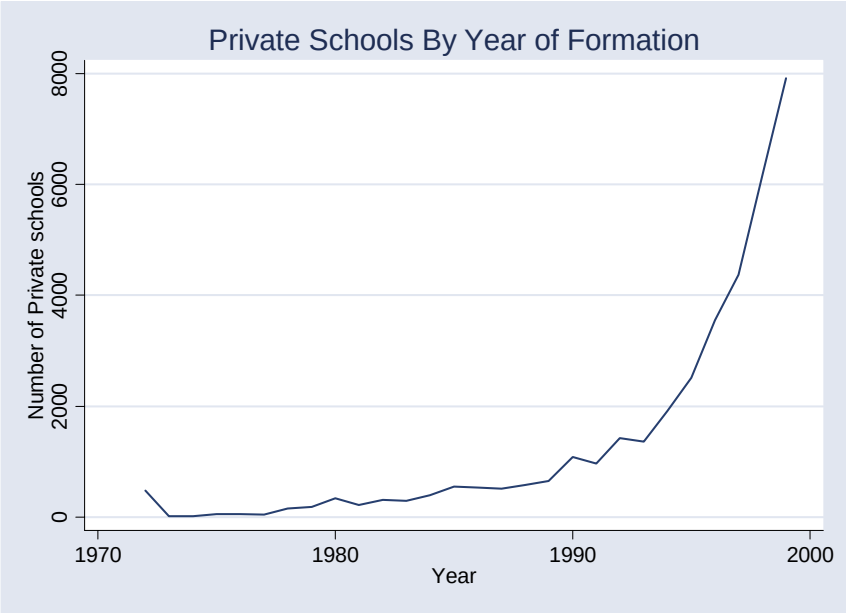
	Villages with Private Schools (%)	Number of educated women per village	Number of educated women per 1000 population
Does not have girls primary or secondary school	11.57	12.27	12.9
Received girls primary only in last 20 years	12.60	12.41	16.2
Received girls primary and secondary in last 20 years	30.79	27.71	18.8

Figure 1: Enrollment in Public and Private Schools



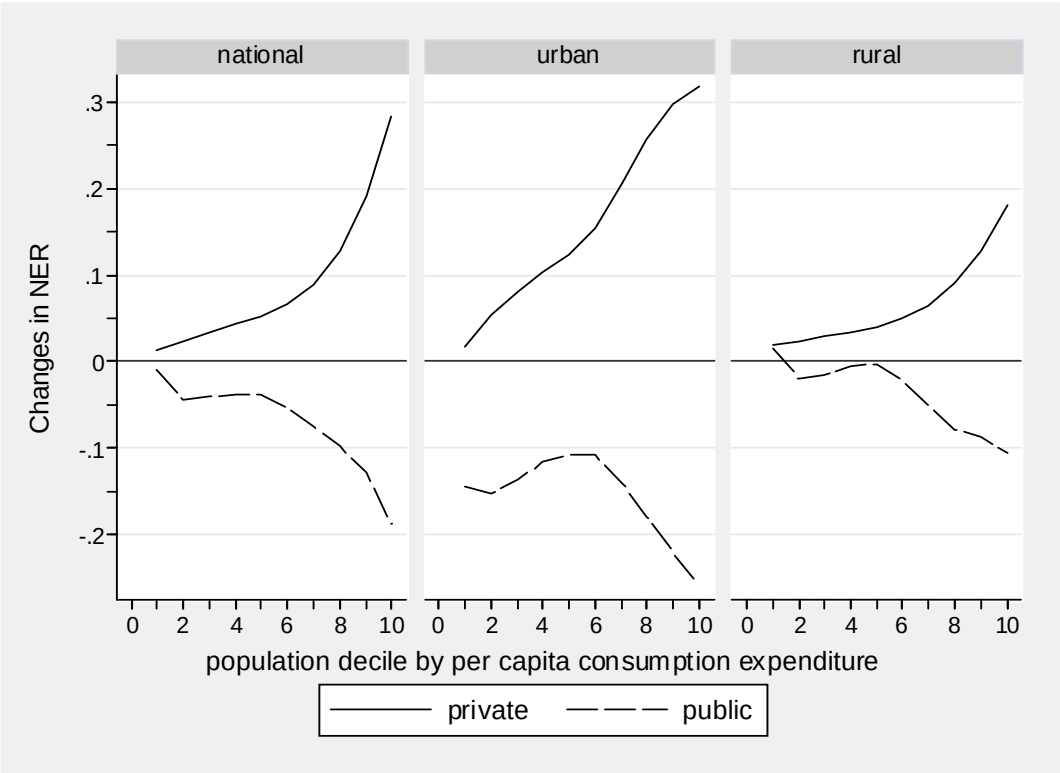
Notes: Percentage is enrollment, as a percentage of the relevant age group: The denominator for primary school enrollment is the population of children aged 5-10; for middle school it is children aged 11-13; and for high school, children aged 14-16.

Figure 2: Rise of Private Schools



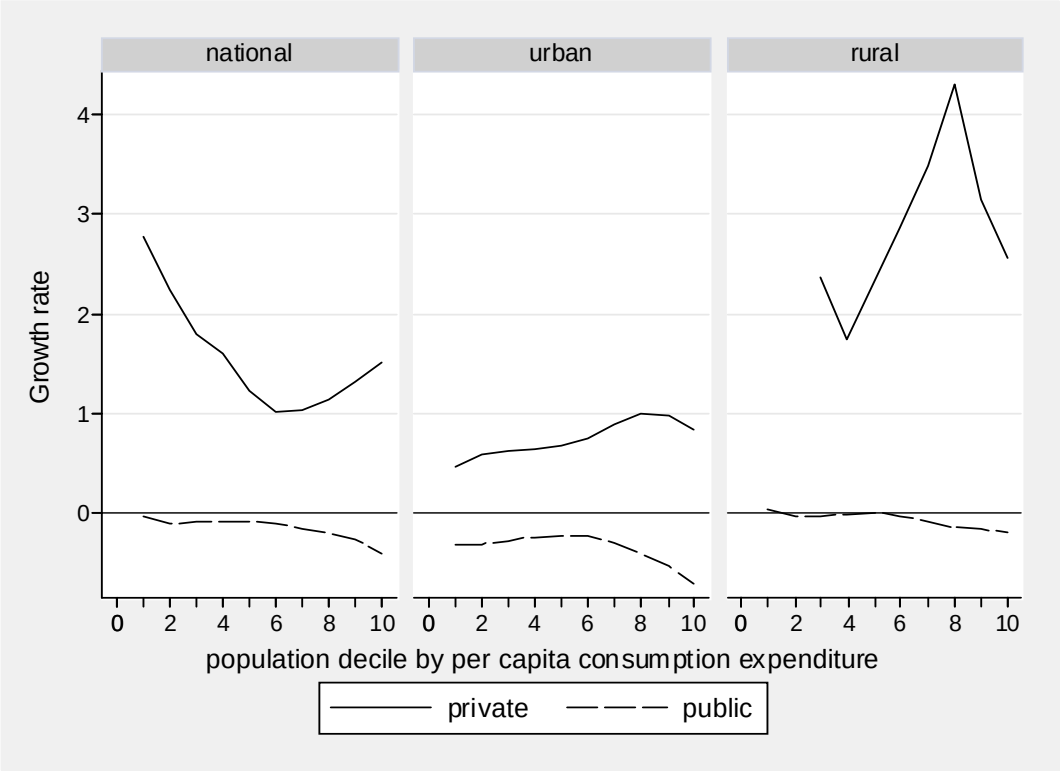
Notes: Source PEIP, 2000

Figure 3: Changes in Net Enrollment Rate in the Public and Private Sector



Notes: Based on PIHS data, 1991 and 2001. The horizontal axis shows income deciles ranked in order of increasing income at the national, rural and urban levels. The vertical axis shows the change in net enrollment rate in the private and public sector. Thus, for instance, the national figure shows that there was very little change for the lowest income deciles and close to a 3 increase for the highest income deciles. Across all regions and income deciles, there was a decline in public sector enrollment during the nineties.

Figure 4: Growth Rate of enrollment in public and private schools



Notes: Based on PIHS data, 1991 and 2001. The horizontal axis shows income deciles ranked in order of increasing income at the national, rural and urban levels. The vertical axis shows the growth in net enrollment rate in the private and public sector. Thus, for instance, the national figure shows that highest growth was among the lowest income deciles, but that within rural and within urban areas higher income deciles saw greater growth in private schooling during the nineties. Across all regions and income deciles, there was a decline in public sector growth during the nineties. Note that growth rates could not be calculated for the bottom two deciles in rural areas, since the initial level was zero.

Figure 5: Map of private school enrollment

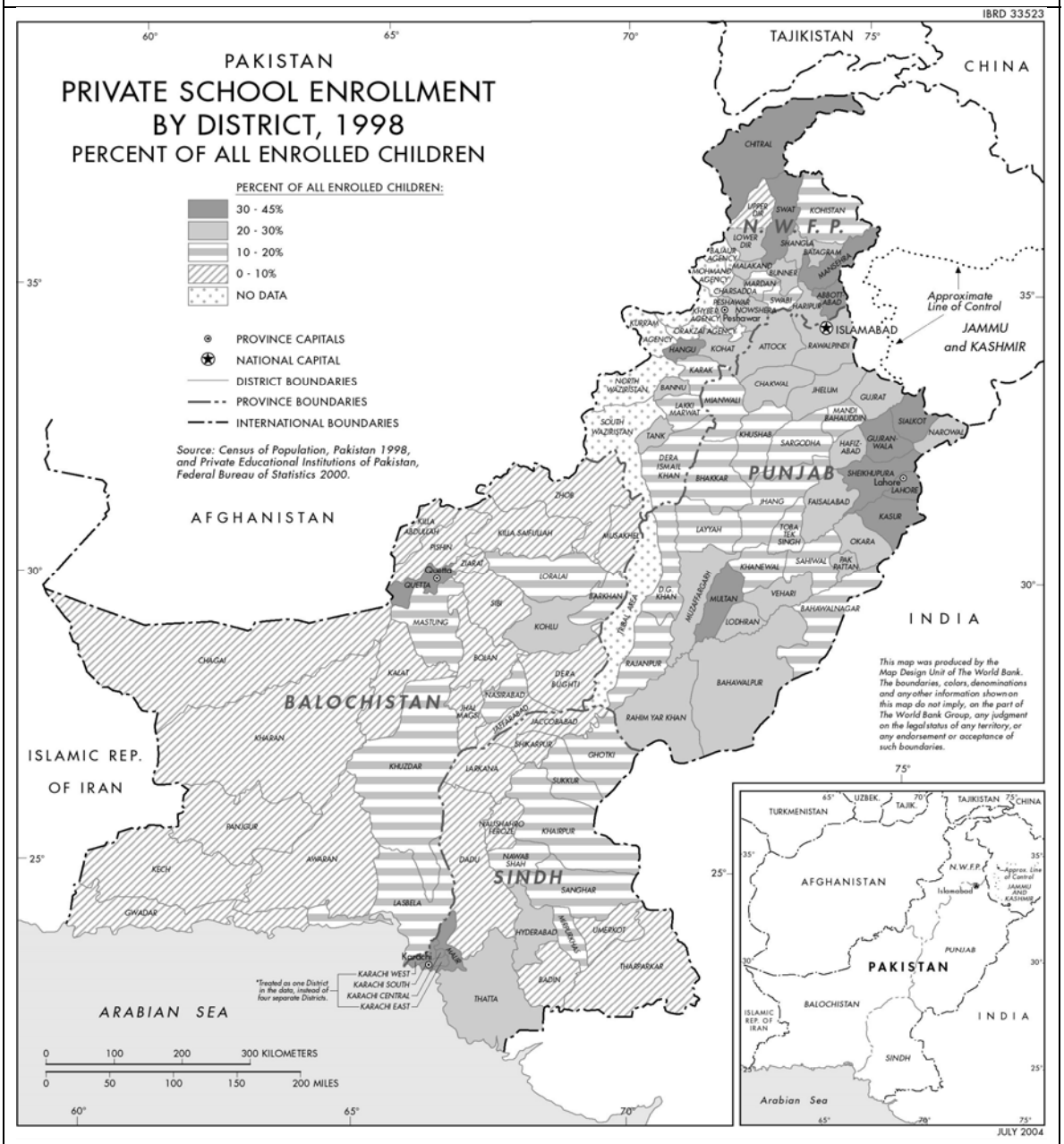


Figure 6

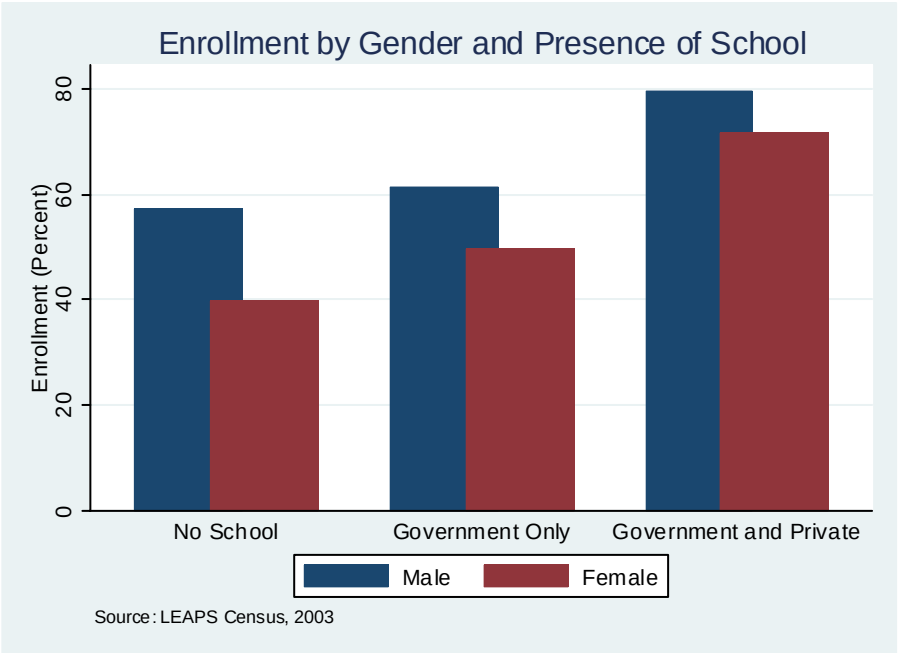


Figure 7

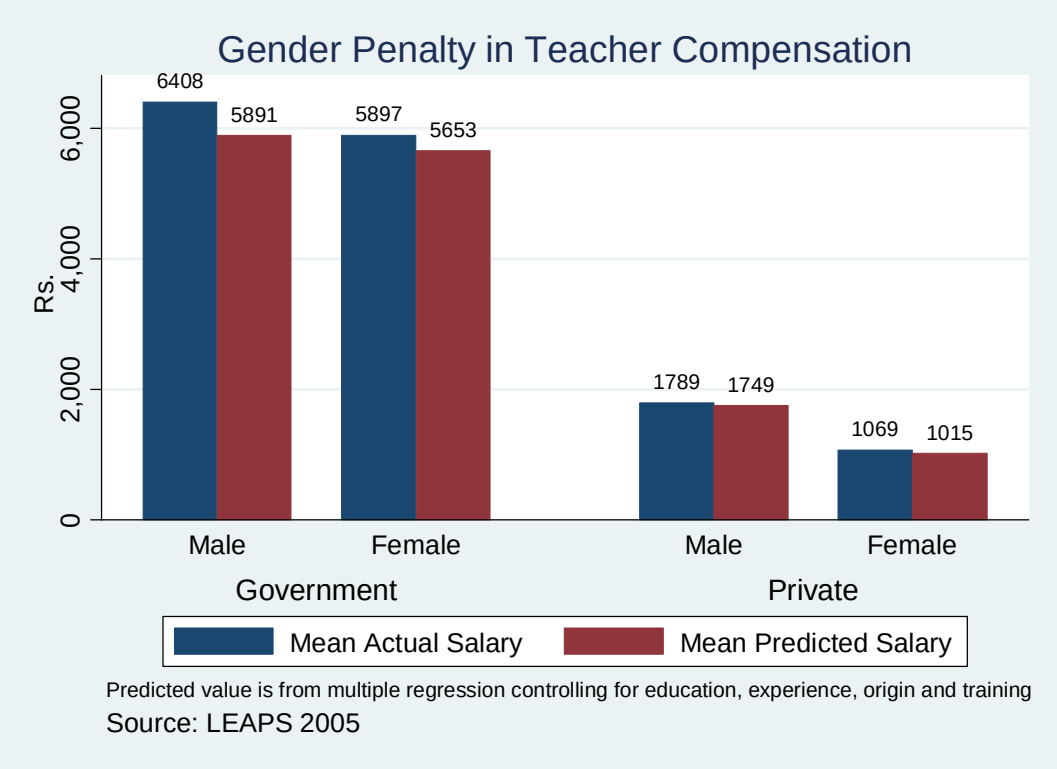
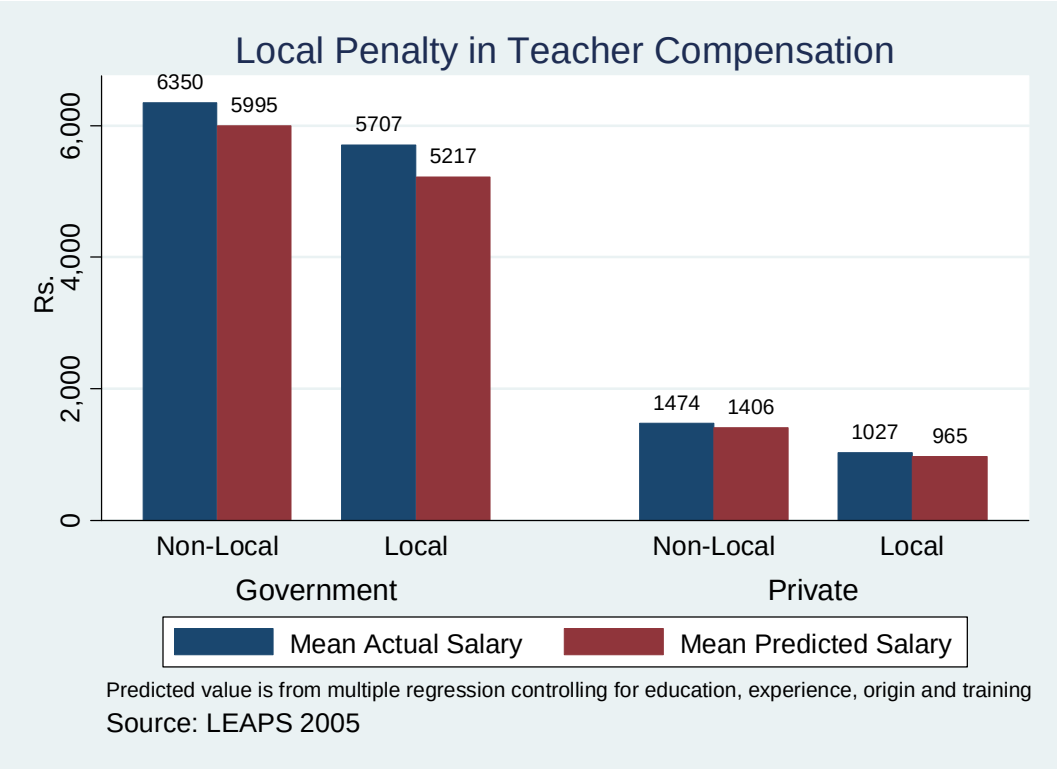


Figure 8


Local Penalty in Teacher Compensation
Rs.
0
2,000
4,000
6,000
6350
5995
5707
5217
1474
1406
1027
965
Non-Local
Local
Non-Local
Local
Government
Private
Mean Actual Salary
Mean Predicted Salary
Predicted value is from multiple regression controlling for education, experience, origin and training
Source: LEAPS 2005

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