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**Promotion with and without Learning:
Effects on Student Dropout**

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Abstract

Many educators and policymakers have argued for lenient grade promotion policy – even automatic promotion – in developing country settings where grade repetition rates are high. The argument rests on the assumptions that repetition discourages persistence or continuation in school and that the promotion of children with lower achievement does not hamper their ability or their peer’s ability to perform in the next level. Alternatively, promoting students into grades for which they are not prepared may lead to higher dropout. This study shows that in a sample of schools from Northwest Frontier Province (NWFP) of Pakistan, promotions are primarily based on merit. An econometric decomposition of the promotion into two parts, one based on indicators of merit (attendance and achievement in mathematics and language) and the other uncorrelated with those indicators) allow a test of whether parental decisions about enrollment are influenced by merit-based or non-merit-based promotions. Results suggest that enrollment decisions are heavily influenced by student academic performance in the previous year, and that promotions that are uncorrelated with merit have a negligible impact on school continuation.

1. Introduction

Two commonly used measures of a school system's efficiency are how many of the students who start a cycle complete it and how many do so on time. From this perspective, school systems with grade repetition rates at or above 20 percent (e.g. Brazil, Nepal, Cameroon, (UNESCO 1998)) are very inefficient. Schiefelbein (1992) estimates that ten million repeaters each year in ten South American countries cost these countries about one billion dollars annually. According to the findings of several studies in the U.S., these resources are virtually wasted because retaining children in a grade offers no academic benefit to the child (relative to grade-level or age-level peers) and may even be harmful to a child's self-perception, thus leading to greater attrition. Holmes (1989) reviewed 63 studies and concluded that, in subsequent school years after repetition, retained children were almost one-third of a standard deviation behind their matched counterparts on achievement measures. Reynolds (1992) compared retained and promoted children in Chicago schools who had been matched on the basis of achievement test scores and teacher ratings *prior* to grade repetition, and found that repeaters performed eight months lower in reading and seven months lower in mathematics than the matched-control group.

There is a contrary view, however, that is represented by a small group of studies, mostly on developing countries. These studies argue that repetition does not harm self-image and does improve student achievement by allowing students who are ill prepared for the next grade to catch up academically and emotionally (Chafe 1984; Eisemon et al. 1993; Gomes-Neto and Hanushek 1994).¹ Gomes-Neto and Hanushek (1994) found that repetition enhances student achievement in Brazil's rural northeast. While retained students are below average in performance before repetition, they move to above average after repetition. Even Holmes (1989) whose meta-analysis of past studies has been cited

often to support the negative view also found evidence that casts doubt on that view: studies that compared retained students with same-grade rather than same-age peers showed positive effects for repetition, particularly in the repeated year itself.²

Perhaps reflecting the conflicting empirical evidence on retention's effects, there exist distinct national policies and practices concerning grade repetition. Denmark, Japan, Korea, Norway, and Sweden have traditionally followed automatic promotion policies. Other countries such as France and most developing countries use grade retention extensively. Ultimately, the appropriate policy choice is likely to depend on the existence of supplementary programs, such as extra help in the regular classroom and before and after school programs for at-risk students.

This study examines a different aspect of the debate about grade repetition. In particular, we test whether promotion policies affect years of schooling. We explicitly consider how parents process the information that grade promotion or repetition provides about student achievement and integrate that information in decisions regarding their children's schooling. In developing countries where primary education is compulsory in theory but not necessarily so in practice, teacher or school decisions about promotion or repetition may not be the deciding factor for whether or not a student remains in school. Parents (if not students) are likely to have the last say in the matter.

First, we establish the extent to which promotions are based on student performance in the classroom. The decision to retain or promote a child is often based on factors other than academic performance, including policies on automatic promotion, student department, and parental preferences. This leads to a decomposition of promotions into two components – one based on observed academic merit and the other a residual. We

then examine how merit-based and non-merit-based promotions are related to continued enrollment (or student dropout).³

Our analysis makes use of a unique data set from the Northwest Frontier Province (NWFP) of Pakistan. The results suggest that teacher promotion decisions in primary schools are based primarily on merit and that enrollment or school-continuation decisions in the following year are affected mainly by merit-based promotions. Promotions that are not correlated with measured student achievement have a negligible impact on the probability of school continuation. This finding implies that parents make their decisions regarding a child's continued schooling on the basis of actual learning in the previous year, rather than on promotion or repetition *per se*. It would also suggest that if a child's ability to learn in future years is reduced by being placed in a grade for which the child is unprepared, then promotion could lead to increased dropout.

2. The Model

This section presents a model of demand for child education in the household, followed by a model of the decisions made by teachers and schools about whether or not to promote students to the next grade. As first proposed by Becker (1967) in his Woytinsky Lecture, households choose levels of human capital investments by equating the (discounted) expected marginal private benefits and the expected marginal private costs of these investments. Applying this framework to the demand for child schooling, parental decisions about child education depend on the direct and indirect costs of schooling, family income, and expected hedonic and/or pecuniary returns to schooling.⁴ This model generally assumes that costs, income, and returns are all known at the time of the decisions.

In reality, information on returns is revealed over time and parental decisions can better be modeled as a sequential one.

Part of the revelation process for parents is learning more about the child's ability and aptitude for school by observing the child's performance in school. Each school year, parents observe the child's progress in school through two indicators, whether the child is promoted to the next grade and how much the child learns. Conditional on new information, parents update their decision (as well as aspirations) regarding how many years the child will remain in school. Abstracting from any compulsory education law, this model implies that if the child's progress is below parental expectations, then parents will reduce the additional number of years the child will be in school.

Another part of the revelation process is parents discovering more about the quality of the schools their children attend, including the extent to which schools are able to impart new knowledge and skills to their children, and about how schools (teachers) assess student performance and decide on which students to promote or retain at each grade. The model below incorporates grade promotion decisions into parental decision making about schooling.

A. Length of Time in School

The human capital model suggests that parents will choose length of time in school in order to maximize a child's lifetime income. The model can be modified somewhat by including the present value of a child's lifetime income in the parents' utility function along with other child attributes. A well-established fact in the economics literature⁵ is that labor earnings are positively correlated with years of attained schooling. The underlying cause for the positive correlation is less well established. If the labor market strictly values skills, then the present value of the investment will depend solely on the human

capital produced, q_{it} . On the other hand, if time in school serves as a screening device for employers, then number of years spent in school would also be valued by them.

To begin, suppose that employers value only the knowledge gained in school. The net present value to the household of the t^{th} year of schooling can be written as

$$V_S^t(q_{it}, W_{it}, C_{it}) \tag{1}$$

where V_S^t is the present value of an additional year of schooling at time t , W_{it} is the market wage earned by a child of age t and knowledge q_{it} , and C_{it} is the cost of schooling incurred in year t . As shown in Figure 1, parents interested in schooling only for its effect on income will continue to invest as long as $V_S^t(\cdot) > 0$.⁶ Optimal t^* occurs where $V_S^t(q_{it}^*, W_{it}^*, C_{it}^*) = 0$.

In general, we would expect $dV_S^t/dt < 0$. There are several reasons for this. First, as t increases by one year, the length of time to earn returns on schooling decreases by one year. Second, as years of schooling increase, a child's human capital, W_{it} rises. Because W_{it} is the opportunity cost of schooling in year t , the opportunity cost of schooling increases in t . Finally, the direct cost of schooling, C_{it} , may also rise as t rises.

But how is information about the level of knowledge attained in school, q_{it} , communicated to employers? Generally, this is measured by the number of years completed by the student, which in turn results directly from a series of promotion outcomes from grade to grade. On the one hand, one can assume that schools provide perfect information on student achievement through grade promotion decisions and that employers (and parents) are thus able to assess accurately how much students have learned in school. On the other hand, the information content of grade promotion decisions depends on several factors – whether promotions are, in fact, based on merit, as measured

by student effort, achievement, or both; whether they are influenced by pressure from aggressive and powerful parents; and whether they are largely in accordance with a social or automatic promotion policy. With or without social promotion, promotion decisions are inherently subjective. At least in part, they provide only partial information on learning such that employers – as well as parents – will have to rely on their own means to assess student performance.

If the labor market rewards promotion (or the number of years of schooling attained) itself, independent of the knowledge gained, then the net present value of the t^{th} year of schooling is

$$V_p^t(q_{it}, W_{it}, C_{it}, P_{it}) \quad (2)$$

where P_{it} indicates if child i is promoted in year t . If promotion has a return beyond the knowledge gained in school, then the optimal length of time in school could rise or fall relative to the case where q_{it} has no value. In other words, parents could raise or lower the amount of time a child is enrolled in school if the number of grades completed is rewarded in the labor market, independent of q_{it} .⁷ The rationale is that the opportunity cost of schooling rises more rapidly when promotions (independent of q_{it}) are valued, even as the marginal returns to a year of schooling are increased. The two cases are illustrated in Figure 1. As before, parents interested only in pecuniary returns to schooling will choose length of time in school t^{**} such that $V_p^t(q_{it^{**}}, W_{it^{**}}, C_{it^{**}}, P_{it^{**}}) = 0$. If automatic promotions are to have a positive effect on a child's length of time in school, then parents must derive some utility from promotion, independent of the utility derived from actual learning.

B. Promotions

Turning now to how promotion decisions are made in schools, suppose that student i 's merit in year t is given by q_{it} . Merit is determined by a human capital production process

$$q_{it} = f(A_{it}, M_{it}, L_{it}) \quad (3)$$

where A_{it} is student attendance during the year, and M_{it} and L_{it} are math and language skills at the end of the year. Conditional on A_{it} , M_{it} , and L_{it} , the teacher derives an estimate of merit, q_{it}^e which differs from actual merit, q_{it} , by a random error, ε_{it} . There is also a threshold level of merit, q_{\min} , necessary to justify promotion to the next grade. Hence, the promotion decision can be written as,

$$\begin{aligned} P &= 1 \text{ if } q_{it}^e = q_{it} - \mathbf{e}_{it} \geq q_{\min} \\ &= 0 \text{ if } q_{it}^e = q_{it} - \mathbf{e}_{it} < q_{\min} \end{aligned} \quad (4)$$

P is a discrete variable that takes the value of one if the student is promoted and zero if the student is failed.

The promotion decision (4) can be estimated by rearranging terms such that

$$\begin{aligned} P &= 1 \text{ if } q_{it} - q_{\min} \geq \mathbf{e}_{it} \\ &= 0 \text{ if } q_{it} - q_{\min} < \mathbf{e}_{it} \end{aligned} \quad (4')$$

If ε_{it} is distributed normally with zero mean, then (4') can be estimated as a probit equation with the elements of q_{it} from (4) and q_{\min} as regressors. If schools hold strictly to a merit-based promotions policy, observed promotions will fail to sort students correctly into qualified ($q_{it} \geq q_{\min}$) and unqualified ($q_{it} < q_{\min}$) groups only due to errors in measuring merit, ε_{it} .

As mentioned earlier, in practice, promotion policy is likely to be based on factors other than merit, such as parental status in the community or parental incentives and ability to exert influence over the teacher. If true, then the probit estimate implied by (4') must be augmented to incorporate these other factors. Suppose, at the other extreme, that only non-merit factors, Z , affect promotion and that teachers base their promotion decisions on an aggregation index of these factors, where this index is assumed to be of the form,

$$I_{it} = Z_{it} \mathbf{b} + \epsilon_{it} \quad (5)$$

The promotion decision based on index I can be written as,

$$\begin{aligned} P=1 & \text{ if } I_{it} = Z_{it} \mathbf{b} + \epsilon_{it} \geq 0 \\ & = 0 \text{ if } I_{it} = Z_{it} \mathbf{b} + \epsilon_{it} < 0 \end{aligned}$$

which can be rearranged to be

$$\begin{aligned} P=1 & \text{ if } Z_{it} \mathbf{b} \geq -\epsilon_{it} \\ & = 0 \text{ if } Z_{it} \mathbf{b} < -\epsilon_{it} \end{aligned} \quad (6)$$

In reality, promotion policies may not mimic either of the two polar cases of merit-based and non-merit based promotions, but may be a combination of the two. If γ is the weight placed on merit factors, then the promotion policy becomes

$$\begin{aligned} P = 1 & \text{ if } \mathbf{g}[q_{it} - q_{\min}] + (1-\mathbf{g})[Z_{it} \mathbf{b}] \geq \mathbf{g}e_{it} - (1-\mathbf{g})\epsilon_{it} = e_{it} \\ & = 0 \text{ otherwise,} \end{aligned} \quad (7)$$

where $0 \leq \mathbf{g} \leq 1$

This hybrid promotion decision returns the strict merit-based policy if $\gamma = 1$, and the strict non-merit policy if $\gamma = 0$. This specification adds another influence on promotion decisions, γ , which might depend on the overall mission of the school, its general policy or

practice with respect to promotions and repetitions, and/or the judgment by teachers of the relative importance of merit versus other considerations.

Two observations must be made about (7). First, it is difficult to determine from data whether non-merit based promotions are due to noisy student evaluations or a low γ . A low γ automatically diminishes the value of student performance. Secondly, a school that values merit in general must improve its method of evaluating students if it is to appropriately reward student performance. Even if γ were high, if student assessments are wildly inaccurate, the impression that will be transmitted is that merit is not valued.

In the estimation we derive a statistical decomposition of promotions into merit- versus non-merit-based components. This will enable us to determine whether unearned grade promotions encourage parents to keep their children in school.

C. Performance, Promotion and Persistence

We considered two alternative views of child persistence in school: parental decisions can be driven by the child's performance in school as in equation (1), or by both performance and promotion as in equation (2). Promotion should be positively correlated with child performance so that $\gamma > 0$ in equation (7), even if $\gamma < 1$ because promotion is not solely merit-based. Distinguishing between equations (1) and (2) requires that the incidence of promotion be decomposed into a component correlated with merit and a component that is uncorrelated with merit. This can be accomplished by predicting promotion on the basis of equation (4'), the strict merit-based model. Student performance is measured by the merit-based component of the promotion, $E(P_{it} | A_{it}, M_{it}, L_{it})$. The difference between actual promotion and the predicted merit-based promotion,

$[P_{it} - E(P_{it} | A_{it}, M_{it}, L_{it})]$, can then be used as the incidence of promotion that is uncorrelated with q_{it} . Consequently, we can approximate equation (2) by

$$V_p^t = E(P_{it} | A_{it}, M_{it}, L_{it}) \mathbf{d}_q + W_{it} \mathbf{d}_w + C_{it} \mathbf{d}_c \quad (8)$$

$$+ [P_{it} - E(P_{it} | A_{it}, M_{it}, L_{it})] \mathbf{d}_p + \mathbf{e}_{it} = \mathbf{u}_p^t + \mathbf{x}_{it}.$$

where \mathbf{d} is a set of parameters to be estimated. The parents' decision to keep the child in school can be modeled as

$$E = 1 \text{ if } \mathbf{u}_p^t > -\mathbf{x}_{it} \quad (9)$$

$$= 0 \text{ otherwise}$$

where $E = 1$ if the child is enrolled in school the following year.

3. Data Sources

The above model is tested using data collected by staff of the NWFP Education Management Information System (NEMIS). The sample of schools was based on a representative sample of 257 government, mosque and private schools that were surveyed by Ali and Reed (1994). For each school, one teacher in each of the first three grades (*kachi* or kindergarten, *pakki* or grade one, and grade two) was selected. The selection was random if there was more than one teacher in a grade. These teachers were given surveys eliciting information on their socioeconomic backgrounds. Similarly, two students in each class were chosen randomly for inclusion in the household survey. Enumerators went to these households to elicit information on the sample child and on the socioeconomic attributes of the child's family. Variable definitions and sample statistics are reported in the Appendix.

During the course of the school year, the enumerators conducted two spot checks on teacher and student absenteeism. The first check occurred in the first two months of the term, and the second occurred in the final two months. Data on monthly student and teacher attendance over the school year were also obtained from the school's attendance register.

Grade-one level exams in mathematics and languages were administered to the grade two children at the start of the academic year, and to grade one children at the end of the term. The tests were designed to assess whether students had acquired skills specified in the national curriculum for grade one or *pakki*. The language test was geared to the language of instruction to avoid giving undue advantage to any one language group.

Lastly, enumerators returned to the schools at the end of the school year and at the beginning of the next to collect information on which students passed or failed, and which students were continuing in school the following year. If the student was not enrolled in the same school, enumerators established whether the student had transferred to another school or had dropped out.

4. Empirical Analysis and Results

First, we analyze the determinants of student promotion. We then use those findings to embed predicted promotions into our analysis of student continuation.

A. Student Promotion

We estimate two versions of the promotion equation, the pure merit-based promotion specification (4') and the hybrid specification (7). Factors reflecting student merit include the test scores for mathematics and language ability. These tests were designed to establish the extent to which students have learned material required by the nationally approved curriculum. Tests were not administered to the *kachi* class because the children were generally not sufficiently advanced in their learning to take a written test.

Another measure of student merit used is the student's official attendance record as reported on the school's attendance register. Spot-checks of student attendance confirmed the reliability of the official attendance record.

A school's required performance for promotion, q_{\min} , is assumed to vary with the school's average score on the math and language achievement tests. This means that it is harder for a student to pass in a school in which students perform better on average. Since the performance level required for promotion should rise with grade level, a dummy variable for grade two is also added. Anything that raises the performance standard should lower the probability of promotion.

Measures of Z include mother's and father's highest grade attained and household income. Parents with high education or income would be expected to have more power or ability to influence teachers. Variables that might reflect parental incentives to do so include the number of younger siblings a child has (since parents may have a particular interest in the success of their first-born child), whether the child is male (since parents may have a stronger desire for their sons to succeed), and whether the child is healthy (since education may be more valuable if the child is expected to be able to reap the benefits of schooling for a longer period of time). Finally, two measures of how well the teacher can assess student performance are used – the teacher's own attendance in class and class size.⁸ The more frequently the teacher is absent and the larger the class, the less the teacher is able to know a given child's ability, and potentially the lower the weight that the teacher can place on merit, ?.

Results are reported in Table 1. Associated elasticities and estimated impacts on promotion probability are reported in Table 2. The first important result is that the pure merit-based promotion specification is rejected in favor of the hybrid promotion model.

That said, the promotion model works amazingly well. Superior performance on either the math or language test significantly increases promotion probability, even though there is no systematic testing system in NWFP. In fact, the teachers did not have the results of these exams at the time they made their decisions on whom to promote. The elasticities for the exams are small (around .06), but the range of the test scores is sufficiently wide to imply a strong role of measured ability.⁹ For each exam, the highest scoring students have predicted promotion probabilities about 15 percentage points higher than do the lowest scoring students.

Promotions are even more strongly tied to student attendance. The elasticity of 0.2 exceeds the combined effect of the mathematics and language exams on promotion. The predicted promotion probability ranges from 15 to 99 percent as the proportion of school days attended varies from zero to one. Promotion probability is not strongly tied to a child's performance relative to other children in the school. Average test scores have a small and statistically insignificant effect on promotion probability. This suggests that promotion standards may not differ significantly across schools.

Because of gender differences in schooling in Pakistan, we also analyze promotion separately for boys and girls. We find that, given school enrollment, the probability of promotion is not significantly different between boys and girls. Boys appear to be less likely to be promoted, other things equal, but this gender effect is extremely small and insignificant. Moreover, several factors that might be expected to affect promotion probability if parents exert an influence on promotions also have no significant impact on promotion probability. Children of poor or uneducated parents and children with physical disabilities do not seem to face significantly lower probability of being promoted to the next grade.

Two factors stand out in the vector of non-merit influences on student promotion. First, children with younger siblings are more likely to pass the grade. This is consistent with the presumption that there will be pressure to pass the older of several children in a family. Schools may promote older children so as not to discourage the enrollment of younger children in the family. Second, student promotion is influenced by teacher attendance. As teacher attendance increases, all else equal, the probability of promotion decreases. Students should perform better when the teacher is present, but these regressions control for student test scores. One plausible explanation for this is that frequently absent teachers have little merit-based information upon which to base promotion decisions and thus cannot defend a decision to hold back a child for another year.

B. Student Continuation

We estimate four specifications of the probability that a student who is currently enrolled will remain in school or drop out in the subsequent year. The first includes child, household, and school attributes, but excludes information on child school performance or promotion. The second adds the dummy variable, P_{it} , indicating whether or not the child was promoted. The third specification decomposes the observed promotion decision into \hat{P}_{it}^m , the component predicted by the merit-based specification (column 2 in Table 1), and $P_{it} - \hat{P}_{it}^m$, the component of the promotion that is not explained by merit. The fourth specification repeats the third except that the merit-based specification conditions only on attendance. This allows us to include in the regression our sample of *kacchi* children for whom we have attendance and continuation information but for whom we have no test data. As the results show, our conclusions are not sensitive to the specification of \hat{P}_{it}^m .

The results are reported in Table 3. The coefficients are quite stable across specifications. The first interesting result is that while boys and girls are equally likely to be promoted, boys are more likely to continue in school than are girls. From the ranges reported in Table 4, boys are 3-7 percentage points more likely to be enrolled in the next school year, other things equal. While this outcome is consistent with the higher average completed years of schooling for boys in the Pakistan population, it seems inconsistent with our sample means which show that girls have continuation rates (.95) that are higher than do boys (.88). The explanation is a classic selection effect. The sample means in the Appendix show that, on average, boys' families are poorer and less educated, boys live farther from school, and boys are less likely to be first-born (i.e. they have fewer younger siblings). Because all of these children are from the same villages and households, this means that girls who are in school come from family backgrounds that are more conducive to continuation. Holding these factors fixed as is done in Table 3, boys are more likely to continue in school than are girls.

Children in villages with child labor markets are less likely to continue in school. Depending on the specification, the existence of a child labor market lowers the school continuation probability by 3-9 percentage points. Mother's and father's education and household income all appear to lower the probability of continuation *ceteris paribus*, but the elasticities are very small and only the mother's education effect is statistically significant. Finally, the results indicate that student continuation is positively influenced by teacher attendance, although the effect is not precisely estimated.

Promotions have a large effect on continuation. Those who are promoted are 40 percent more likely to continue in school than those not promoted. This would seem to support a mandatory promotion policy. However, when we decompose promotions into

their merit and nonmerit components, the merit component clearly drives the continuation effect. The simulated ranges in Table 4 show that the merit-based promotions have an effect 12 times larger than that of promotions based on other factors. The associated merit-based promotion elasticity is an order of magnitude larger than the nonmerit elasticity. We conclude then that it is the information about learning embodied in the promotion rather than the promotion itself that leads to a child staying in school. In contrast, promotions that are unrelated to merit, as in mandatory promotion policies, would have a much smaller 3-5 percentage point effect on the probability of continuing in school.

We estimate the same equations separately for girls and boys. These regressions are not presented here but are available upon request from the authors. To summarize, the results do not change our earlier conclusions. While we are able to reject the null hypothesis that the coefficients in the boys' and girls' continuation equations are equal, the qualitative effects are similar for boys and girls. The main difference is that the existence of a child labor market has a strong negative effect on boys' continuation but an insignificant effect on girls'. Teacher attendance has a positive effect on continuation for both boys and girls, but this is significant only for boys' continuation.

The results demonstrate a large difference in the impact of merit-based promotions by gender. A girl student who has been promoted on the basis of achievement is 70-90 percent more likely to continue in school than a girl who has been held back. In comparison, a boy student promoted on merit is only 50-percent more likely to persist than is a boy who is held back suggesting that student performance is more important in deciding whether a girl remains in school. For both boys and girls, however, the impact of non-merit based promotion on the probability of continuing in school is minimal.

5. Conclusions

The relatively few previous studies on grade repetition in developing countries present conflicting evidence on whether grade repetition increases school drop out. This study suggests an explanation for the mixed evidence – promotions matter for persistence primarily when promotions are based on student performance. Parental decisions regarding continued enrollment in school depend on promotion that is associated with academic achievement. Promotions that are not correlated with student achievement have only a very small impact on persistence. In the setting that we study, a mandatory promotion policy would have almost no effect on the number of children in school, much less ensuring that children achieve what they are expected to learn.

While it may be imprudent to generalize from this evidence, our results do suggest that grade repetition can have different meanings and consequences in developing countries than in industrialized countries. The right policy approach to address high repetition depends first on which students are repeating. High repetition rates at the end of the primary cycle, as is the case with many African countries, primarily reflect a supply bottleneck in the next education cycle. Mandatory promotion could simply push those students out of school (Eisemon et al. 1993).

But what of high repetition rates throughout the cycle? Past studies in various countries have found that grade repetition is higher for children who come from poorer homes and schools (Gomes-Neto and Hanushek 1994; Patrinos and Psacharopoulos 1992; Pradhan 1999). In fact, this is unfortunately too common a phenomenon as to result in a

significant lowering of individual self-esteem. In the difficult situations under which many of these students must study – impoverished home conditions that prevent them from being ready for school at the right time, and poor school situations that offer little motivation to learn or stay enrolled – reducing repetition rates in a mechanical way is surely not the right remedy. A remarkable result in our study is that even poorly educated parents are able to discern their children's academic progress and incorporate this information in deciding whether to send their children to school for another year. Consequently, the goal of keeping more children enrolled in school in Pakistan requires upgrading the quality of the basic education system so that children will truly learn more.

Endnotes

¹ Eisemon and co-authors (1993) find that, in Burundi, grade repetition at the end of the primary cycle is the accepted way by which sixth-grade students prepare for a very selective entrance examination that would give them a place in a greatly limited secondary school system. This form of repetition is markedly different than that which occurs much earlier in the cycle.

² In addition, many of the studies Holmes (1989) reviewed do not appropriately control for differences in the characteristics of students. Only 25 of the 63 studies used matched comparison designs; only 16 studies matched students on prior achievement, and only 8 studies matched students on characteristics that are generally found to predict grade repetition.

³ Existing evidence of the effect of repetition on drop-out is mixed. For example, Grissom and Shepard (1989) suggest that grade repetition leads to dropout (by 20-30 percent) even after controlling for the effects of factors that explain repetition itself, such as achievement, socioeconomic status and gender (Grissom and Shepard 1989). For the U. S., Eide and Showalter (1998) found that after controlling for the endogeneity of grade repetition, its effect on dropout is negative, but insignificant.

⁴ See, for example, Behrman and Deolalikar 1991; Alderman, Orazem and Paterno 1996; Anderson, King and Wang 1999 for studies on developing countries.

⁵ See Willis (1986), and Polachek and Siebert (1993) for reviews.

⁶ A similar model with similar implications can be expressed in terms of utility of discounted lifetime income.

⁷ Grade repetition, however, can dilute marginal returns to each year spent in school. Behrman and Deolalikar (1991) examined the effect of high repetition rates on returns to primary education in Indonesia and found those rates to be extremely overestimated. Under alternative estimates of repetition rates, these rates are overstated by 82-114 percent for the below-completed-primary level and by 38-78 percent for the completed primary category.

⁸ We use the spot check observations on teacher attendance rather than the official teacher attendance. The official attendance was nearly 95 percent, but the spot check attendance averaged only 80 percent.

⁹ The probability range for any variable X was estimated by computing the probability of promotion at the minimum and maximum value of X, holding all other variables at their sample means.

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Table 1 : Probit Analysis of Student Promotion

Variable	1	2	3
Constant	-0.5910 (0.9377)	-1.4999* (0.6824)	-2.3702** (0.4068)
Male	-0.1561 (0.2212)		
Student monthly attendance	3.3564** (0.8079)	2.8163** (0.6876)	3.7812** (0.3915)
Math achievement test score	0.0635* (0.0251)	0.0569** (0.0217)	
Language achievement test score	0.0746** (0.0275)	0.0673** (0.0236)	
Grade 2	-0.4211* (0.2014)	-0.2144 (0.1743)	
School average math score	0.0049 (0.0440)	-0.0163 (0.0384)	0.0242 (0.0264)
School average language score	-0.0582 (0.0446)	-0.0462 (0.0380)	0.0119 (0.0251)
Teacher spot-check attendance	-1.8782** (0.6311)		
Number of students	-0.0042 (0.0051)		
Mother's education	-0.0069 (0.0419)		
Father's education	-0.0032 (0.0208)		
Number of younger siblings	0.2183* (0.0865)		
Usually healthy?	-0.1275 (0.4196)		
Household income	0.0090 (0.0282)		
Log Likelihood	-113.33	-141.12	-247.55
N	693	786	972
χ^2 for H ₀ : equal coefficients between boys & girls	17.47		
χ^2 for H ₀ : only achievement variables matter	17.49*		

Notes: Standard errors in parentheses. Sample sizes reflect available information on the variables used in each specification.

* significant at 5%

** significant at 1%

Table 2: Elasticities and Probability Ranges for the Analysis of Student Promotion

Variable	1		2		3	
	elasticity	range	elasticity	range	elasticity	range
Male	-0.008	(0.98, 0.97)				
Student monthly attendance	0.206	(0.15, 0.99)	0.225	(0.24, 0.98)	0.569	(0.03, 0.97)
Math achievement test score	0.064	(0.83, 0.99)	0.075	(0.82, 0.99)		
Language achievement test score	0.059	(0.85, 1.00)	0.070	(0.84, 1.00)		
Grade 2	-0.015	(0.98, 0.95)	-0.010	(0.97, 0.95)		
School average math score	0.005		-0.021		0.059	
School average language score	-0.039		-0.040		0.020	
Teacher spot-check attendance	-0.109					
Number of students	-0.007					
Mother's education	0.000					
Father's education	-0.001					
Number of younger siblings	0.025					
Usually healthy?	-0.009					
Household income	0.003					

Note: Estimated elasticities are evaluated at sample means, using the coefficients from Table 1. The estimated ranges reflect predicted probabilities of promotion at the minimum and maximum values of a variable, holding all other variables at their sample mean values.

Table 3: Probit Analysis of Student Continuation

Variable	All children			
	1	2	3	4
Constant	0.8275* (0.3835)	-0.3288 (0.4312)	-0.4305 (0.8668)	-1.2012* (0.4879)
Male	0.5140** (0.1203)	0.4963** (0.1373)	0.2442 (0.1954)	0.4186** (0.1415)
Child jobs?	-0.4017** (0.1519)	-0.6410** (0.1688)	-0.4532* (0.2250)	-0.5037** (0.1792)
Mother's education	-0.0496** (0.0191)	-0.0590** (0.0211)	-0.0102 (0.0318)	-0.0499* (0.0223)
Father's education	-0.0129 (0.0126)	-0.0182 (0.0143)	-0.0330♦ (0.0189)	-0.0182 (0.0147)
Younger siblings	0.0585 (0.0474)	0.0124 (0.0537)	0.0507 (0.0743)	-0.0079 (0.0551)
Usually healthy?	0.0578 (0.2439)	0.0917 (0.2652)	0.1649 (0.3676)	0.0289 (0.2750)
Distance to school	0.0031 (0.0292)	-0.0068 (0.0301)	0.0021 (0.0389)	-0.0054 (0.0296)
Household income	-0.0061 (0.0158)	-0.0109 (0.0170)	-0.0175 (0.0219)	-0.0118 (0.0176)
Grade 2	-0.1660 (0.1174)	-0.1017 (0.1324)	0.0879 (0.1826)	-0.1468 (0.1370)
Teacher spot-check attendance	0.5727 (0.3447)	0.5840 (0.3844)	0.6223 (0.5438)	0.5307 (0.3931)
Actual promotion, P_{it}		1.6428** (0.1479)		
Performance-based promotion, \hat{P}_{it}^m			1.6896* (0.7969)	2.8373** (0.3433)
Promotion based on other factors, ($P_{it} - \hat{P}_{it}^m$)			0.5912♦ (0.3280)	1.3620** (0.1662)
Log likelihood	-305.23	-240.40	-117.00	-221.98
N	1212	1211	653	1192
H_0 : equal coefficients bet boys & girls	19.59*	23.71**	17.54♦	28.46**

Notes: Standard errors in parentheses. Sample sizes reflect available information on the variables used in each specification.

♦significant at 10%

* significant at 5%

** significant at 1%

Table 4: Elasticities and Probability Ranges for the Analysis of Student Continuation

Variable	All children			
	1 elasticity range	2 elasticit range y	3 elasticit range y	4 elasticit range y
Male	0.0470 (0.88, 0.95)	0.0319 (0.92, 0.97)	0.0116 (0.96, 0.98)	0.0137 (0.96, 0.99)
Child jobs?	-0.0093 (0.94, 0.88)	-0.0105 (0.97, 0.88)	-0.0055 (0.98, 0.93)	-0.0042 (0.98, 0.95)
Mother's education	-0.0071	-0.0059	-0.0008	-0.0026
Father's education	-0.0085	-0.0084	-0.0113	-0.0043
Younger siblings	0.0116	0.0017	0.0052	-0.0006
Usually healthy?	0.0074	0.0082	0.0109	0.0013
Distance to school	0.0005	-0.0007	0.0002	-0.0003
Household income	-0.0043	-0.0054	-0.0064	-0.0030
Grade 2	-0.0074 (0.94, 0.92)	-0.0032 (0.96, 0.95)	0.0020 (0.97, 0.97)	-0.0023 (0.98, 0.98)
Teacher attendance	0.0632 (0.85, 0.95)	0.0453 (0.89, 0.97)	0.0355 (0.92, 0.98)	0.0210 (0.95, 0.98)
Actual promotion, P_{it}		0.1410 (0.59, 0.97)		
Performance-based Promotion, \hat{P}_{it}^m			0.1109 (0.62, 0.98)	0.1206 (0.33, 0.99)
Promotion based on other factors, $(P_{it} - \hat{P}_{it}^m)$			0.0090 (0.96, 0.99)	0.0182 (0.95, 1.00)

Note: Estimated elasticities are evaluated at sample means, using the coefficients from Table 1. The estimated ranges reflect predicted probabilities of promotion at the minimum and maximum values of a variable, holding all other variables at their sample mean values.

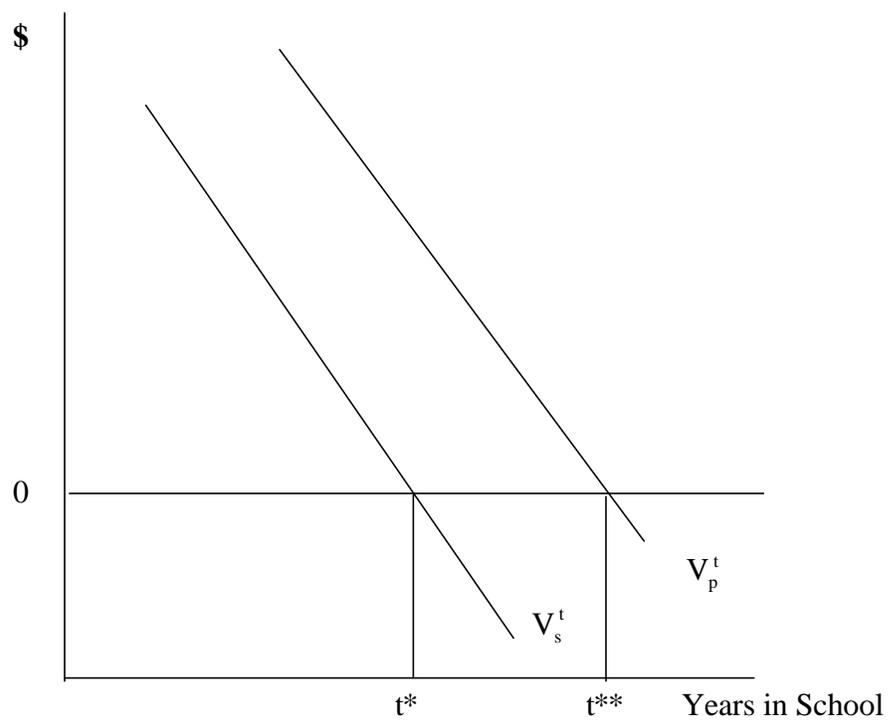
Appendix Table: Sample Means of Variables

Variable	Description	All children	Boys	Girls
Promotion	=1 if the child is promoted	0.91 (0.29)	0.89 (0.31)	0.92 (0.28)
Continuation	=1 if the child is enrolled the next School year	0.92 (0.27)	0.88 (0.33)	0.95 (0.23)
Male		0.68 (0.47)		
Student attendance	Average monthly attendance Taken from school records	0.87 (0.16)	0.85 (0.16)	0.88 (0.15)
Math achievement test score		14.25 (5.42)	14.39 (4.23)	13.92 (3.37)
Language achievement test score		11.24 (6.24)	10.11 (4.78)	9.27 (3.50)
Grade 2	=1 if child is in grade 2	0.33 (0.47)	0.32 (0.47)	0.33 (0.47)
Teacher attendance	Average spot-check attendance, By school	0.82 (0.16)	0.80 (0.16)	0.82 (0.16)
Number of students	Total number of students in school	24.98 (17.06)	28.74 (19.48)	22.98 (15.77)
Distance to school	Distance of the sample child's school (km.)	1.09 (2.12)	0.71 (0.91)	1.27 (2.48)
Child jobs?	=1 if there is a job in the area for a Child of this age	0.17 (0.38)	0.04 (0.20)	0.23 (0.42)
Mother's education	Mother's highest grade attended	1.06 (2.59)	1.30 (2.95)	0.94 (2.40)
Father's education	Father's highest grade attended	4.89 (4.91)	6.21 (5.15)	4.28 (4.67)
Younger siblings	Number of younger siblings	1.47 (1.20)	1.63 (1.28)	1.39 (1.16)
Usually healthy?	=1 if the child is usually healthy	0.95 (0.22)	0.95 (0.21)	0.95 (0.22)
Household income	Estimated household income (Rs. 1000)	5.22 (3.62)	5.63 (4.03)	4.98 (3.42)

Note: Standard errors in parentheses.

Figure 1. Choice of optimal length of time in school for parents interested in maximizing net present value.

Case A: Returns to promotion raise time in school



Case B: Returns to promotion lower time in school

