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ABSTRACT

Schools in developing nations tend to be concentrated in urban areas, making it necessary for children living in rural areas to travel long distances to attend school. Government resources are limited and many countries have limited education expenditures due to faltering economic growth. Since government is the principal provider of education and the demand far exceeds the supply, some economists are now advocating increasing school fees to fund education improvements. Using a theoretical model of the demand for schooling and the principle of compensating variations, this study calculated parental willingness to pay for new secondary schools in rural areas of Peru. The results showed that even those in the poorest quarter of the Peruvian income distribution sector were willing to pay fees high enough to cover operating costs of opening new secondary schools in rural villages. An extensive list of statistical tables and a 25-item bibliography are included in the report. (NL)

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LSMS

Living Standards
Measurement Study
Working Paper No. 54

The Willingness to Pay for Education in Developing Countries

Evidence from Rural Peru

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The Willingness to Pay for Education in Developing Countries

Evidence from Rural Peru

The Living Standards Measurement Study

The Living Standards Measurement Study (LSMS) was established by the World Bank in 1980 to explore ways of improving the type and quality of household data collected by statistical offices in developing countries. Its goal is to foster increased use of household data as a basis for policy decisionmaking. Specifically, the LSMS is working to develop new methods to monitor progress in raising levels of living, to identify the consequences for households of past and proposed government policies, and to improve communications between survey statisticians, analysts, and policymakers.

The LSMS Working Paper series was started to disseminate intermediate products from the LSMS. Publications in the series include critical surveys covering different aspects of the LSMS data collection program and reports on improved methodologies for using Living Standards Survey (LSS) data. More recent publications recommend specific survey, questionnaire, and data processing designs, and demonstrate the breadth of policy analysis that can be carried out using LSS data.

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Number 54

The Willingness to Pay for Education in Developing Countries

Evidence from Rural Peru

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ABSTRACT

In recent years, citing the low price elasticity of demand for schooling, some economists have advocated increasing school fees to raise revenue for educational improvements in developing countries. But elasticities alone are not enough - one must estimate the willingness to pay for schooling improvements to see whether higher fees are in fact desirable. Using a rigorous theoretical model of the demand for schooling and the principle of compensating variations, we calculate the willingness to pay for new secondary schools in rural Peru. We find that rural Peruvian households are indeed willing to pay fees high enough to more than cover the operating costs of opening new secondary schools in their villages. This is even true of the poorest quarter of the income distribution.

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I. INTRODUCTION

Education is arguably one of the most important means of raising worker productivity and thus of raising incomes in developing countries. Almost all developing countries have committed sizeable resources to this end in the last few decades. Schools, though, tend to be concentrated in urban areas so that children living in rural areas must often travel long distances to school. Unfortunately, government resources available for expanding rural school systems and for other objectives are limited. This is particularly true in the 1980's as many developing countries have had to limit education expenditures due to faltering economic growth (World Bank, 1986).

In most developing countries the government is the principal, if not the sole, provider of education. In order to promote enrollment, many governments offer educational opportunities at little or no cost, which can lead to situations where the demand for education far exceeds supply. This possibility has led some to suggest that households should pay a school fee (tuition) so as to raise additional revenues that can be used to improve school quality and build new schools, particularly in rural areas (Thobani, 1983; Birdsall, 1983; World Bank, 1986; Jimenez, 1987). These suggestions are not always well received since the provision of free education is often viewed as a goal in itself. Further, some have argued that raising fees will reduce educational attainment among the poor and thus exacerbate inequality (Klees, 1984; Cornea, Jolly and Stewart, 1987).

The issues here must ultimately be resolved by examining empirical evidence. In this paper we characterize the user fee debate in terms of how much families are willing to pay for improvements in the educational system, where a household's willingness to pay is measured as a compensating variation. We specify a utility maximizing model of school enrollment decisions that yields an empirical specification of the demand for schooling from which estimates of willingness to pay are calculated. This model uses a discrete choice framework that includes a price-income interaction in the demand functions. Thus, the model allows price elasticities and willingness to pay to vary by income. As a result we are able to consider the distributional effects of user fees.

II. USER FEES AND WILLINGNESS TO PAY FOR EDUCATION

Most of the debate over user fees has focused on the price elasticity of the demand for schooling; i.e. the effect of increased school fees on enrollment.[1/] Yet, the ultimate effect of school fees on enrollment depends on how the funds raised from these fees are used. If they are used to improve schools - e.g. raise quality or build new schools so as to reduce travel time - they may actually encourage school attendance. Whether such a policy actually leads to an increase in household welfare, though,[2/] depends on how much households are willing to pay for the improvements.[3/] If the amount families are willing to pay for the improvement is greater than the marginal cost of the improvement, the government can increase user fees to pay for improvements in a way that raises welfare. If, on the other hand, the willingness to pay is below marginal cost, a subsidy to cover the difference would be required to make the policy welfare increasing.

Advocates of increased school fees believe that households are willing to pay the cost of improving schools and thus would be better off if

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1/ Jimenez (1987) provides an excellent survey of this literature.

2/ Although increased enrollment usually implies higher welfare, it is possible that welfare and enrollment will move in opposite directions after simultaneous changes in both the price and the quality of education (Katz, 1987).

3/ The amount families are willing to pay is the income that they must be given to make them just as well off after a reduction in quality or an increase in travel time as they were before the change -- i.e. the compensating variation. The compensating variation is the difference in the areas under the old and new Hicksian demand curves. Price elasticities alone do not allow for calculation of willingness to pay because elasticities do not indicate the location of the demand curve.

school fees were raised to pay for improvements in schooling. Critics doubt that households are willing to pay for improvements, and they are also worried that willingness to pay among the poor is substantially less than among wealthier families.[4/] If this were true, raising user fees would reduce household welfare and generally reduce school enrollment, especially among the poor. Indeed Table 1 shows that poorer families are less likely to send their children to secondary school than are wealthier families in rural Peru. In our analysis we explicitly explore these distributional issues.

TABLE 1: Secondary School Enrollment in Rural Peru by Expenditure Groups

Expenditure Group	Enrollment Rate
Poorest 25%	40%
Lower Middle 25%	44%
Upper Middle 25%	51%
Wealthiest 25%	55%

Source: 1985-86 PLSS data. Expenditure groups are based on per capita expenditures.

Are households in fact willing to pay for improvements in schooling services? Fee advocates (e.g. Thobani, 1983) suggest that if rationing is observed there is a *prima facie* case for raising fees to build more schools because rationing implies excess demand for places in school. But this begs the question of how one observes school places being rationed. One form of

4/ Critics may also fear that user fees will be used *in place of* general revenues for schooling, so that promises to improve schooling are never kept and households face the same educational opportunities at a higher price than before.

rationing is that the number of places may be limited so that children are turned away at the school door according to criteria such as age or test scores. In this case, some families who demand schooling at the current price are explicitly rationed out. Alternatively, places could be rationed implicitly by locating schools far away from some rural communities (Birdsall, 1983). In this case, enrollments are rationed by both direct transportation costs and the opportunity cost of time. Families who are willing to pay the fee as well as costs associated with distance can find places for their children, but those willing to pay the fee but not the distance costs are effectively priced out of the system. In Peru there is little evidence of explicit rationing at the secondary level. Rather, we observe implicit rationing as indicated by the skewed geographical distribution of schools and associated enrollment rates presented in Table 2 (see also World Bank, 1985, p. 62).

TABLE 2: Secondary School Enrollment in Rural Peru by Travel Time to School

One Way Travel Time to Nearest Secondary School	Percent of Sample in Category	Enrollment Rate
Less than 1 hour	59%	56%
1 - 2 hours	21%	42%
2 - 4 hours	15%	29%
More than 4 hours	6%	25%

Source: 1985-86 PLSS data.

The data in Table 2 suggest that building new secondary schools in areas where the nearest school is far away should increase enrollment. In order to reduce travel time, though, new schools must be built and new teachers hired. Thus, the real welfare question boils down to whether families in a village are willing to pay the cost of opening and operating a new school.[5/] To determine this one needs to estimate willingness to pay for reduced travel time, and how it varies by income.[6/] Once this is known, one can begin to assess whether user fees can be used to finance school improvements in developing countries and the extent to which user fees penalize the poor. In the following section, we develop a model which measures the willingness of rural households in Peru to pay for reduced travel time to secondary schools.

5/ The issue here is whether school fees alone can be used to finance new schools. If families are unwilling to pay the full cost it does not follow that a new school should not be built, since the social benefits of raising education may be higher than the private benefits. Rather unwillingness to pay the full cost implies that, if the social benefits of a new school exceed the social costs, other sources of finance must be also tapped.

6/ An analogous argument holds with respect to evaluating proposals to improve school quality with funds raised from higher user fees.

III. A MODEL OF THE DEMAND FOR SCHOOLING

Education is both a consumption good and an investment good; it is valued for its own sake and because it provides future financial returns. Most observers would agree that all children should receive a primary education, and in many countries it may be advisable to raise secondary school enrollments as well.[7/] The fact that some children are not attending school indicates that, in their parents' eyes, the advantages of sending their children to school are outweighed by the disadvantages. The advantages are the benefits that parents receive from well educated children, both direct material returns (e.g. their children will support them in their old age) and the satisfaction of having educated and financially successful children. The main disadvantages to sending a child to school are the associated costs, which may be a heavier burden on poorer families. A family enrolls a child for another year of schooling if the benefits derived from schooling are greater than the associated costs.

We formalize this decision by adapting a general model of the willingness to pay for social services found in Gertler and van der Gaag (1988). We assume that every household has a utility function which depends on the human capital of its children and the consumption of all other goods and services. An investment in another year of schooling raises a child's human capital at the cost of reduced consumption of other goods and services. In any given year, the choice is discrete: Should the child be

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7/ Indeed Stelcner et al. (1987) report large returns to both primary and secondary education in Peru.

enrolled for another year of school? In rural Peru there are three choices faced by parents: (1) send their child to a local public school for the year; (2) send the child away from home to a more distant, but presumably higher quality, school;[8/] or (3) do not send the child to school. The price of sending children to school includes both direct money costs (fees and books) and the indirect cost of children's time in terms of reduced work, both housework and work outside the home. Parents compare the utility attained from the three options listed above and choose the option with the highest utility.

We begin formalizing the model by specifying the utility obtained from each option. Thus, let the expected utility conditional on sending a child to school be given by:

$$U_i = U(S_i, C_i) + \varepsilon_i, \qquad i = 1, f \tag{1}$$

where S_i is the increment to a child's human capital from another year of education from school, C_i is the consumption possible after incurring both the direct and indirect costs of sending a child to school i, and ε_i is a random taste shifter. The subscripts 1 and f refer to local and faraway (i.e. sending a child to live away from home) schools, respectively. If the parents decide not to send their child to either a local or faraway school utility will simply be:

8/ This would in many, if not most, cases be a private school. Unfortunately our data do not indicate the type of school for children living away from home while attending school.

$$U_o = U(C_o) + \varepsilon_o = U(0, C_o) + \varepsilon_o \tag{2}$$

where C_o is the consumption possible without incurring the direct and indirect costs of either schooling option and ε_o is a random taste shifter.

Of course, the decision to send a child to school depends on the quality of education received.[9/] We formalize this by assuming that the higher the quality of education, the greater the increase in human capital (i.e. increase in S_i) from another year of schooling, and therefore the higher the utility from the schooling option, ceteris paribus. One would normally expect that the only reason for a child to go to a faraway school is that such schools are of higher quality than the local school.

Both the faraway and local school options have associated budget constraints of the form:

$$C_i + P_i^* = C_o = Y, \qquad i = l,f. \tag{3}$$

where P_l^* and P_f^* are the prices of sending the child to local and faraway schools for one year, respectively, and Y is yearly family disposable (net of savings) income.

The price of schooling involves both direct and indirect costs. Direct costs include school fees, outlays for textbooks, and the like. The

9/ Indeed, Behrman and Birdsall (1983, 1985) find the quality of schooling to be an important determinant of wages.

crucial indirect cost is the opportunity cost of children's time. In developing countries children's time is important because they often make substantial contributions to family income by working, including housework. Table 3 demonstrates that there are large differences in hours worked between students and non-students in rural Peru.

Both direct and indirect costs are not necessarily the same across households. Even if fees and textbook costs are the same for all households direct costs may vary due to differences in the distance to the nearest secondary school. Specifically, if the school is far away, direct outlays on transportation may be required, and if the school attended is so far away that children must live away from home, lodging costs are also incurred. Indirect costs may also vary due to both differences in work time lost due to school attendance and variation in child wage rates across geographic areas. The variation in direct and/or indirect costs allows one to estimate the effect of raising user fees on school enrollments.

We are now ready to discuss the utility maximization problem. The unconditional utility maximization problem is

$$U^* = \max(U_0, U_1, U_s) \tag{4}$$

where U^* is maximum utility, and U_0, U_1 and U_s are the conditional utility functions specified in (1) and (2), given the constraints in (3). Since these are stochastic terms in the utility function, the solution to the utility maximization problem gives the probability that each alternative is chosen. In a discrete choice model, the probability that an alternative is chosen can

TABLE 3: **Mean Hours Per Week in Activities of Potential Secondary Students: Rural Peru 1985-86**

		Hours in School	Hours Working Outside the House	Hours Housework	Total Work Hours
Rural Costa					
Boys 10-14:	Students	23.6	7.7	9.3	17.0
	Not Students	0.0	21.3	6.8	28.1
Boys 15-18:	Students	20.7	12.7	7.8	20.5
	Not Students	0.0	26.8	5.0	31.8
Girls 10-14:	Students	22.8	4.7	11.8	16.5
	Not Students	0.0	11.8	15.8	27.6
Girls 15-18:	Students	17.8	12.0	10.2	22.2
	Not Students	0.0	12.3	26.5	38.8
				Average	19.1
					31.6
Rural Sierra and Selva					
Boys 10-14:	Students	24.4	8.7	9.7	18.4
	Not Students	0.0	25.1	8.7	33.8
Boys 15-18:	Students	24.6	13.1	8.1	21.2
	Not Students	0.0	36.3	6.9	43.2
Girls 10-14:	Students	25.0	8.8	12.8	21.2
	Not Students	0.0	25.7	17.9	43.6
Girls 15-18:	Students	24.6	9.3	15.7	25.0
	Not Students	0.0	27.7	22.9	50.6
				Average	21.6
					42.8

Source: 1985-86 Peru Living Standards Survey. These figures are calculated from the same sample used in the estimations presented in Section VI.

be interpreted as a demand function. We will use these demand functions to solve for the unconditional indirect utility and expenditure functions. The unconditional functions are used to assess the welfare impact of policy changes in terms of compensating variations.

IV. EMPIRICAL SPECIFICATION

Solving the utility maximization problem yields a system of demand fun ions, whose forms are probabilities that the alternatives are chosen. The probability that any alternative is chosen equals the probabi ity that this choice yields the highest utility among all the alternatives. The functional form of the demand functions depend on that of the conditional utility function and on the distribution of the stochastic variables.

The Conditional Utility Function

Gertler, Locay and Sanderson (1987) show that income can influence the choice only if the conditional utility function allows for a non-constant marginal rate of substitution of schooling for consumption. A parsimonious form of the conditional utility function that does not impose a constant marginal rate of substitution is the semi-quadratic, which is linear in human capital and quadratic in consumption. Specifically, let the conditional utility function for the two schooling options be:

$$U_i = \alpha_0 S_i + \alpha_1 C_i + \alpha_2 C_i^2 + \varepsilon_i \qquad i = 1,f \tag{5}$$

where each ε_i is a zero mean random taste disturbance with finite variance and is uncorrelated across individuals.

Consumption net of schooling expenditures can be derived from (3):

$$C_i = Y - P_i^* = Y - P_i - wH_i \qquad i = 1,f \tag{6}$$

where w is the opportunity cost of the child's time, H_i is hours of child's work lost due to school attendance, which varies over the local and faraway school options, and P_i is the direct price (money cost) of sending a child to school i. Substituting (6) into (5) yields

$$U_i = \alpha_0 S_i + \alpha_1(Y - P_i - wH_i) + \alpha_2(Y - P_i - wH_i)^2 + \varepsilon_i \qquad i = 1,f \qquad (7)$$

as the utility derived from sending one's child to either a local (i=1) or faraway (i=f) school. The utility from keeping the child at home is:

$$U_0 = \alpha_1 Y + \alpha_2 Y^2 + \varepsilon_0. \qquad (8)$$

The identification of the parameters in (7) and (8) requires that the values of human capital and consumption differ across the alternatives. The alternative chosen is the one that yields the highest utility. Attributes that are constant across alternatives are differenced out of the decision rule.[10/] Thus it is variation in prices across alternatives that identifies α_1 and α_2. If prices did not vary across alternatives, then consumption would be constant across alternatives and difference out of the decision rule.

10/ For example, if there were only two alternatives, the child would go to school if $U_1-U_0 > 0$. Any identical terms in U_1 and U_0 would be differenced out of the decision rule and thus not influence the choice.

A simple transformation of the conditional utility function illuminates the role of prices in the model. Since the decision rule involves comparing utility levels across alternatives, the conditional utility functions can be normalized relative to one of the alternatives without loss of generality. We normalize the utility from no-schooling alternative to zero by subtracting (8) from (7) for both the local and far-away options. In this case (7) becomes:

$$U_i - U_0 = \alpha_0 S_i - \alpha_1(P_i + wH_i) - \alpha_2\left[2(P_i + wH_i)Y - (P_i + wH_i)^2\right] + \varepsilon_i - \varepsilon_0 \qquad (9)$$

Notice that income has differenced out of the consumption term but not out of the consumption squared term. The linear consumption term represents just price, whereas the consumption squared term includes both a price-income interaction term and a squared price term. Thus, our specification includes a price term and a price-income interaction.

If we had assumed a linear utility function, the squared terms on the right-hand sides of (7) and (8) would not be present. The contribution of income to utility would then reduce to $\alpha_1 Y$, which is constant across alternatives and implies a constant marginal rate of substitution. Income would then difference out of the decision rule and consequently not influence the alternative chosen. In our non-constant marginal rate of substitution specification, the quadratic consumption term implicitly includes a price-income interaction which is not constant across alternatives and thus cannot be differenced out of the model. This price-income interaction allows price effects to vary by income.[11]

Quality

Not all schools are the same, and better schools will provide "more" human capital per school year and thus will be more attractive to parents.[12] Also, some students will receive "more" human capital from the same school than others. For example, students who can get help from educated parents may become better educated than classmates with uneducated parents. One cannot observe "quality" directly but one can observe various school and demographic characteristics which are thought to contribute to school quality and estimate a household human capital production function. Similarly, the marginal utility of increments to human capital may also vary by demographic

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11/ Some studies try to include income in the decision rule by allowing α to vary by alternative and setting $\alpha_2 = 0$. In this case the decision rule becomes

$$U_i - U_0 = \alpha_0 S_i + (\alpha_{1i} - \alpha_{1o}) y + \alpha_{1i} (-P_i - wH_i).$$

For this specification to be identified, the coefficient on consumption must be different for each alternative. In other words, the marginal utility of consumption must be different for the two alternatives even when evaluated at the same level of consumption and quality. This implies that two alternatives that provide the same quality of education for the same price must yield different levels of utility. Thus preferences are not well ordered and transitive, and therefore stable utility functions do not exist. See Gertler, Locay and Sanderson (1987) for details.

12/ See Behrman and Birdsall (1983, 1985) for a discussion of schooling quality.

characteristics. Pollak and Wachter (1975) argue that the separate effects of demographic variables in the production of human capital and in the marginal utility function cannot be identified. We therefore specify a reduced form model of the utility from human capital.

Formally, let utility from human capital be given by

$$\alpha_0 S_i = \gamma_i X_i + \eta_i, \tag{10}$$

where X_i is a vector of school quality and demographic characteristics.[13] To make the specification as general as possible, we let the coefficients in (10) be different for the home and away school alternatives. Allowing for different intercepts permits the baseline quality to vary by alternative, and having different slope coefficients allows the school's productivity to vary with individual characteristics such as age and current school year. The random disturbance term captures unmeasured portions of the quality function. These disturbances may be correlated across alternatives.

Substituting (10) into the conditional utility function (7) yields:

$$U_i = V_i + \varepsilon_i + \eta_i \qquad i = 1, f \tag{11}$$

where

[13] Elements in the vector X_i which are household or individual specific will not vary across schools and thus do not take the i subscript. Those which are school specific will vary by schools, hence the need for the i subscript on X_i.

$$V_i = \gamma_i X_i + \alpha_1(Y - P_i - wH_i) + \alpha_2(Y - P_i - wH_i)^2,$$

for the schooling option, and

$$U_0 = V_0 + \epsilon_0 \qquad (12)$$

where

$$V_0 = \alpha_1 Y + \alpha_2 Y^2$$

for the no-schooling option.

<u>The Demand Functions and Welfare</u>

Many discrete choice demand studies assume that the demand functions take on a multinominal logit (MNL) form. The MNL suffers from the Independence of Irrelevant Alternatives assumption which is equivalent to assuming that stochastic portions of the conditional utility functions are uncorrelated across alternatives, and imposes the restriction that the cross-price elasticities are the same across all alternatives. A computationally feasible generalization of the MNL is the Nested Multinominal Logit (NMNL) introduced in McFadden (1981). The NMNL allows for correlation across sub-groups of alternatives and, therefore, non-constant cross-price elasticities. The NMNL also provides a specification test for groupings, and the NMNL is a generalization of the MNL as the MNL is "nested" within it.

The NMNL specification for our problem is as follows. We assume that the joint distribution of the error terms follow a Type B extreme value distribution. The η_j's imply that the error terms of the schooling alternatives may be correlated with each other, but not with the no school alternative. Therefore, the no school demand function (i.e. the probability of not going to school) is:

$$\pi_0 = \frac{\exp(V_0)}{\exp(V_0) + \left[\exp(V_1/\sigma) + \exp(V_f/\sigma)\right]^\sigma} \tag{13}$$

and the demand schooling alternative i is:

$$\pi_i = \left(1 - \pi_0\right) \frac{\exp(V_i/\sigma)}{\left[\exp(V_1/\sigma) + \exp(V_f/\sigma)\right]^\sigma} \qquad i = 1, f \tag{14}$$

where σ is one minus the correlation the error terms in the conditional utility functions of the local and faraway schooling options introduced by the η_j's, and the V's are given by (10) and (11).

McFadden shows that σ must be between zero and one for the model to be consistent with utility maximization. When σ is less than one, the error terms in the local and faraway schooling alternatives' conditional utility functions are correlated. This implies that individuals view local and faraway schooling as closer substitutes with each other than with the no-schooling alternative. When $\sigma = 1$, all of the alternatives are viewed as equally close substitutes and the NMNL reduces to an MNL.

The estimated demand functions in (12) and (13) can be used to assess the impact of user fees on demand and revenues. They also form the basis of our measurement of the willingness to pay for closer schools or schools of higher quality. Willingness-to-pay is calculated as a compensating variation

- the amount of income that an individual must be compensated to make the family just as well off after a price or quality change as before the change. The calculation involves using the demand functions to solve for the unconditional indirect utility and expenditure functions used in estimating compensating variation (c.f. Small and Rosen, 1981). In the case of a nested multinominal logit, the compensating variation for an increase in travel time is:

$$CV = (1/\lambda)\ \{\ln[\exp(V_0) + [\exp(V_1/\sigma) + \exp(V_f/\sigma)]^{\sigma}]$$

$$- \ln[\exp(V_0') + [\exp(V_1'/\sigma) + \exp(V_f'/\sigma)]^{\sigma}]\} \qquad (15)$$

where V_j and V_j' are evaluated at the original and new travel times respectively, and where λ is the marginal utility of income.

V. DATA

The data employed are from the 1985-86 Peru Living Standards Survey (PLSS), a multi-purpose household survey jointly undertaken by Peru's Instituto Nacional de Estadistica (INE) and the World Bank. This survey is described in detail in Grootaert and Arriagada (1986). The survey contains detailed information on the education of all household members, including expenditures on education and information on the school attended for all household members presently attending school. There is also community level data concerning the local secondary school, including distance and travel time if it is located outside the community. This community level data is only available for rural areas sampled in the survey. Other useful data at the community level are daily agricultural wage rates for men, women and children, which can be used to estimate the opportunity cost of time associated with school attendance.

The sample consists of rural children between the ages of 10 and 18 who live in rural areas in Peru. Any child who had already finished secondary school or had not completed primary school was deleted.[14/] The survey also contains data on children who live away from home, including whether or not they are enrolled in school. We include them in our sample and apply the

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14/ Eliminating households without children eligible to enroll in secondary school should not cause any serious selectivity problems since we are only interested in willingness to pay among families whose children are qualified to enroll. Yet it is possible that the parents of children who do not complete primary school may decide to have them finish and enroll in secondary school if a new secondary school opens nearby, thus there may be a small tendency to underestimate the willingness of a community to pay for closer secondary schools.

household and community data of their parent's household.[15] Since mother's and father's education is important, we also deleted a few children for which that information was not available. A child is defined as enrolled if he is presently attending school or, if there is a school vacation, he attended school when it was last in session.

The definitions of variables used in the estimation are presented in Table 4. The most important variables in the specification are consumption income and its square, which are constructed as follows. Conceptually, family income, Y, is non-labor income plus the sum of the value of all family members' time spent working. We observe the value of household consumption under the current schooling choice (Glewwe, 1987). If the child is not in school the observed value of consumption is assumed to be Y. If a child is in school, then Y equals observed household consumption plus the direct and indirect costs of his or her schooling, where the latter is the value of the additional time the child would work if not in school.[16] For the local

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15/ While there is no problem with children leaving home to attend school, if parents move their entire household to be nearer to a school another selectivity problem arises (cf. Rosenzweig and Wolpin, 1984). To check this we examined reasons for migration for the most recent move in the last 15 years. About 77% had not moved, 12% moved for work reasons, 9% moved for "family reasons," 1% moved for marriage and 1% "other." It appears doubtful that such selectivity is a problem.

16/ We do not include lost leisure time in the indirect cost of schooling since it cannot be determined for children who leave home to attend school.

TABLE 4: Definitions of Variables

CONSUMPTION	- Value of per capita consumption associated with each option
CONSUMPTION SQUARED	- Value of per capita consumption squared.
YEAR IN SCHOOL	- Number of school years completed by the child
FEMALE CHILD	- Dummy variable which takes the value of 1 if child is female and 0 if child is male.
FATHER YEARS EDUC.	- Number of years of completed schooling of child's father
MOTHER YEARS EDUC.	- Number of years of completed schooling of child's mother
MOTHER YEARSx FATHER YEARS	- Interaction variable between MOTHER YEARS EDUC and FATHERS YEARS EDUC.
CHILDREN AGED 13-17	- Number of household members between ages 13 and 17
TRAVEL TIME	- Time in minutes required to travel to the nearest secondary school
LACK OF TEACHERS	- Lack of teachers cited as problem for local primary schools

school option, the additional time is the difference in the mean hours worked in both work outside the house and housework between students and non-students, as shown in Table 3. For the faraway school option it is assumed that all the child's work as reported in Table 3 is lost. This time is valued at the local child agricultural wage rate per day, assuming that it measures a six hour day.

Using the data from Table 3 to calculate the reduction in time spent working brought about by school attendance could lead to a selectivity bias. Average hours worked by non-students may not be an accurate indicator of the hours students would work if they were not in school. We investigated this issue by estimating selectivity correlated labor supply functions for the two alternatives using methods presented in Lee (1983). We then use the estimated labor supply functions to predict hours of work conditional on the schooling choice. These predictions were then used to calculate work time lost to the household from a child's school attendance. When this method is used the results are very similar to those obtained when the value of lost work was calculated from the data reported in Table 3. The selectivity corrected model and the estimates are reported in Appendix II.

To find the direct cost of schooling, we used the PLSS data to calculate mean household expenditures on school fees, transportation costs, meals and lodging (for those living away from home), and the cost of textbooks. In order to [illegible]e the added cost of attending a more distant local school, mean transportation costs for the local school option were calculated from the PLSS data for different travel time categories. In fact, direct fees are negligible, even for children who go away to school.17/

We sum the direct and indirect costs of sending children to school to obtain the total "price" of schooling for each alternative. The prices and income are used to calculate household consumption for each alternative. Household consumption is then divided by the number of family members to convert total consumption into per capital terms. Means for income, schooling prices and household size are given in Table 5.

17/ The major costs of sending a child away to school are meals and lodging, which together account for 70% of the total direct cost of the faraway school option.

Now turn to variables that enter the utility of human capital equation. Recall that this list includes variables that affect both the marginal utility and the return from schooling. The first is the number of years of schooling completed by the child. It may be that initial years of secondary school contribute less to future earning power than later years. If so, families will place a higher value on later years of school and consequently be more likely to send a child to secondary school who has already completed the earlier years. Since parents may discriminate against daughters there is a dummy variable for female children. A negative parameter on this variable would indicate that either the parents value education less for girls or that the expected future returns from female children are smaller than those for males.

The education of parents can raise the utility they receive from sending their child to secondary school in three ways. First, parents' education may be positively correlated with children's ability, which in turn results in more education received per year of school attended and thus higher utility per year of children's schooling. Second, better educated parents may place a higher value on their childrens' education. Third, educated parents can provide an environment conducive to better learning, such as directly helping children with schoolwork, which will also raise the human capital received per year by the child. Since having two well-educated parents may not necessarily double these effects, an interaction term for mother's and father's years of schooling is added.

Table 5: Descriptive Statistics

	Variable	Mean	Standard Deviation
Variables Used to Construct Consumption Terms (C and C^2)	Household Income (if child not enrolled)	20,483	19,286
	Price of Schooling, Local School	334	42
	Price of Schooling, Faraway School	779	50
	Household Size	7.20	2.57
Variables Used in Human Capital Term (αS)	Year in School	5.98	1.29
	Female Child	0.43	-
	Father Years Education	3.31	2.72
	Mother Years Education	1.52	2.14
	Children Aged 13-17	1.47	0.93
	Travel Time (Hours)	1.57	2.35
	Lack of Teachers	0.09	-

Children who do not attend school:	38%
Children who go to local school:	43%
Children who go to faraway school:	19%
Sample Size	718

Note: Household income and schooling prices are in terms of June 1985 Peruvian intis per year.

One variable used pertains to household composition. Larger families may derive less utility from sending an additional child to school because having one more child in school may be less important if some are already enrolled. Yet the price for sending each child is the same. A priori one would expect that additional children, between ages 13 and 17 (the years normally associated with secondary school) would reduce the utility derived from sending any one of them to secondary school.

In addition, we include two indicators of local school quality.[18] The first is a dummy variable which takes the value of one if there is a general lack of qualified teachers as indicated by the fact that community members cited this as a fault of local primary schools. Though it does not directly apply to secondary schools it is likely to be highly correlated with the same problem in local secondary schools. The second school quality variable is travel time to the local school. In selectivity corrected models of hours in school and labor supply, we found that travel time to the local school has a strong negative effect on hours in school.[19] The fact that travel time cuts into hours in school suggests that it can have a negative effect on school quality and should be incorporated in the $\alpha_0 S$ term as well as into the cost of schooling.

18/ The local secondary school is defined as the nearest school to the household. All other schools in Peru are considered to be faraway schools. Thus the set of faraway schools is almost identical for each household in the sample.

19/ This finding is explained in Appendix I.

VI. RESULTS

The NMNL model of school enrollment was estimated by full information maximum likelihood. The estimates are presented in Table 6.[20] The coefficients on consumption and consumption squared are both significantly different from zero, implying that the marginal utility gain from consumption diminishes relative to the gain from education as incomes rise. Prices enter through the consumption variables, and as discussed earlier, it is the variation in price that is significant here. The estimate of sigma is greater than zero and less than one, which implies that the nested multinominal logit model is the correct specification. It also implies that local and faraway schooling are closer substitutes with each other than they are with the no-schooling option.

Turning to the other parameter estimates, we find a significantly negative effect by sex for both the local and faraway schooling options - female children are less likely to attend local secondary schools than otherwise identical males. This could be due to either lower expected future returns to schooling among females relative to males, which would cause parents to educate sons rather than daughters, or to discrimination against women regardless of their earnings potential. For both options we also find that parents' level of education is positively correlated with enrollment, though not always significantly so. The interaction term between mother's and father's education, though, is negligible.

20/ Although a simpler two-step estimate exists (McFadden, 1981), Hensher (1986) reports that full information maximum likelihood achieves substantial gains in efficiency over the more popular two-step procedure.

TABLE 6: Nested Multinominal Logit of Demand for Schooling

Variable	Coefficient	t-statistic
Consumption $(\alpha,)$*	0.53	1.88
Consumption Squared (α_2)**	-0.31	-2.35
Sigma (σ)	0.76	3.30
Local School Alternative:		
Constant	-4.00	-2.63
Year in School	0.61	2.32
Female Child	-0.84	-2.53
Father Years Education	0.20	1.42
Mothers Years Education	0.18	1.99
Mother Years x Fathers Years	0.00	0.06
Children Aged 13-17	-0.23	-1.60
Travel Time	-0.35	-5.08
Lack of Teachers	-0.63	-1.79
Far Away School Alternative:		
Constant	-5.92	-3.76
Year in School	1.04	3.67
Female Child	-0.77	-2.15
Father Years Education	0.10	0.63
Mother Years Education	0.16	1.68
Mother Years x Fathers Years	-0.00	-0.01
Children Aged 13-17	-0.51	-3.29

- Log likelihood = 621.55
Sample Size = 718

* Variable divided by 100 for estimation
** Variable divided by 10,000 for estimation

The other estimated parameters differ across the two schooling options. Taking first the local school option. Years in school has a positive effect. This implies that later years of local secondary schooling are valued more by parents than initial years, presumably because the later years contribute more to future earnings. The presence of other children of secondary school age (13-17 years) has a small negative effect on the decision to enroll children in the local school, yet it will be seen below that this is not the case for the faraway schooling option. Indicators of poor local school quality have strongly negative effects on enrollment. As explained in the appendix, travel time reduces hours in school, which ought to reduce the quality of education received. This lowered quality dissuades parents from sending children to local schools. Also, lack of teachers in the local system has a negative effect on the local schooling choice; the interpretation here is that parents are less likely to send their child to local schools if they perceive that staff shortages result in lower quality education.

The faraway school alternative displays different parameter estimates for the years in school and other children variables. The impact of years in school is again positive but stronger for faraway schools. This implies that later years of secondary education in a faraway school are seen as much more valuable than the initial years and that an additional year of schooling from a faraway school has a higher return than from a local school. In addition, the presence of other children of secondary school age (13-17) has a strong negative effect on sending children away from home for schooling. It may be that among households with several children of secondary school age the increment to utility of sending one child to a faraway school is larger than subsequent increments from sending additional children.

VII. PRICE ELASTICITIES

The effect of user fees on school attendance and the relative impact across different income groups is often measured by price elasticities. Since prices enter the demand functions in a non-linear fashion through the consumption and consumption squared terms, price elasticities vary over price and income. Thus arc price elasticities of demand for schooling are presented in Table 7 for different income groups and different total price ranges for both the local and faraway school options. The elasticities are computed via sample enumeration.

Looking across the rows for both the local and faraway school alternatives one sees a small decline in price elasticities as incomes rise, until one reaches the wealthiest 25%, where price elasticities are noticeably lower. This implies that a given increase in user fees will cause about the same proportionate reduction in school attendance among the poorest 75% of the population but a much smaller proportionate reduction for the wealthiest 25%. Thus increases in user fees will reduce enrollments less among the richest group when compared to the rest of the rural population in Peru. Looking down columns, we find that as prices rise the demand for education becomes much more sensitive to changes in price. Over the relevant price ranges one sees that the demand for education is relatively price inelastic, so that there may be some scope for introducing user fees. However, as the direct price of schooling rises, the demand for education becomes more sensitive to price increases so that there is a limit to the inelastic portion of the demand curve for education.

TABLE 7: Arc Price Elasticities for Secondary Education

Price Range	Poorest 25%	Next 25%	Next 25%	Wealthiest 25%	All Rural Areas
Local School Alternative					
0-300 Intis	-0.14	-0.13	-0.12	-0.05	-0.11
300-600 Intis	-0.23	-0.22	-0.21	-0.09	-0.19
600-900 Intis	-0.35	-0.33	-0.32	-0.13	-0.28
900-1200 Intis	-0.47	-0.45	-0.43	-0.18	-0.38
Faraway School Alternative					
0-300 Intis	-0.19	-0.18	-0.17	-0.07	-0.15
300-600 Intis	-0.32	-0.31	-0.29	-0.10	-0.25
600-900 Intis	-0.47	-0.44	-0.42	-0.14	-0.36
900-1200 Intis	-0.61	-0.59	-0.54	-0.18	-0.47
Average Household Income	7,236	13,154	21,002	48,679	20,483

VIII. WELFARE NEUTRAL PRICES

Price elasticities cannot reveal whether instituting user fees to build more schools is desirable, since they do not account for the benefits of the uses to which the funds raised are put. This can only be done by calculating willingness to pay for improvements in schooling services. As noted earlier, secondary schooling in Peru is implicitly rationed by a skewed distribution of schools in rural areas. In this section we evaluate the welfare effects of a proposal to alleviate this rationing by building new secondary schools in villages where they do not exist and charging user fees to cover the costs. To be completely self-financing, the total fees should cover operating costs, so that the government can operate the new schools without increasing its educational budget.[21/]

Whether families will benefit from this proposal depends on whether the reduction in welfare from having to pay the fees is less than the gain in welfare from having schools closer. The welfare neutral fee is the maximum amount families are willing to pay in order to reduce the distance their children must travel (i.e. the compensating variation). If the welfare neutral fee is greater than marginal cost, then charging fees at marginal cost to finance the new school would be welfare improving and enrollments would

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21/ We do not include capital costs since these are one time expenditures. The major capital cost is the building. Since the life of a building is long, construction costs averaged over the years are small relative to operating costs.

probably increase. On the other hand, if the welfare neutral fee is less than marginal cost, such a policy would reduce welfare, and school enrollment as well.

Welfare neutral prices are calculated using the compensating variation formula in equation (15). This has been done separately for each income quartile under two different scenarios The scenarios calculate the willingness to pay to reduce travel time to the local school to zero (Intis per year) when the local school is one and two hours away respectively. Table 8 presents the welfare neutral prices for each income quartile in absolute terms (columns A) and as a percentage of income (columns B).

The data in Table 8 reveal that reducing travel time offers minor benefits to households if the nearest existing school is one hour away. However, if the school is two hours away willingness to pay jumps dramatically. The intuition behind this is that raising the travel time to two hours makes families much more likely to either remove their child from school or send the child away to school. The former is viewed as undesirable and the latter is expensive (cf. Table 5). Table 8 shows that families in the wealthiest income quartile are willing to pay about 30% to 50% more in absolute terms to reduce travel time than are households from the other income groups. In relative terms, though, the lower income groups are willing to pay a much greater share of their budget.

To gauge the welfare implications of the proposal to use school fees to finance reductions in travel time we need to compare the willingness-to-pay estimates to operating costs. The vast majority of a school's budget goes towards teachers' salaries. Using the PLSS, we found that in rural Peru the average annual teacher salary is about 12,000 Intis. Therefore, assuming an average class size of 30 the cost of teachers per student is about 400 Intis per year. From Table 8, it is clear, no households, rich or poor, are willing to pay enough to cover teachers salaries to reduce travel time by one hour. It is also clear, though, that households from all income groups are willing to pay more than enough to cover operating costs to reduce travel time by 2 hours. Thus, for communities in which

TABLE 8: Willingness to Pay to Reduce Travel Time to Secondary School: June 1985 Intis per year and Percent of Income

	INCOME QUARTILE									
Travel Time to Nearest School	Poorest 25%		Next 25%		Next 25%		Wealthiest 25%		All Rural Areas	
	A	B	A	B	A	B	A	B	A	B
1 Hour	135	1.8%	143	1.1%	152	0.7%	203	0.4%	160	0.8%
2 Hours	1096	15.1%	1120	8.5%	1146	5.5%	1301	2.7%	1172	5.7%

A - Willingness to Pay in June 1985 Intis per year.
B - Willingness to Pay as a percentage of household income.

children have to travel two or more hours to secondary schools, the policy of using school fees to finance opening new schools in these communities will be welfare improving. We emphasize that this result holds for all income groups including the lowest income quartile.

IX. CONCLUSION

Policy makers need reliable information on the likely effects of user fees on school enrollment in order to see whether raising those fees would be an effective method to improve the delivery of educational services. This paper has discussed the issues involved and then turned to household data from rural Peru to estimate the likely effect of implementing school fees on school attendance. The estimates show that demand for schooling at the secondary level is quite inelastic at present fee levels. However, as fees are raised demand becomes more elastic, although the elasticity is still less than unity. Moreover, we find that the price elasticity of demand is higher for lower income groups.

Price elasticities, though, are not sufficient information to evaluate whether raising school fees to finance school improvements is in fact a desirable policy. One needs to examine the benefits as well as the costs. Household's willingness to pay for the improvement is a measure of the benefits. By comparing willingness to pay to the cost of an improvement, we can determine if an improvement in schools can be consumer financed and still be welfare increasing.

In rural Peru, schooling is rationed by a skewed distribution of schools. We used the principle of compensating variation to calculate household's willingness to pay to reduce travel time to secondary schools. We find that households are willing to pay more than the costs of operating a new school to reduce travel time from two hours to zero. These results apply to all households, even those from the lowest quartile of the income distribution. This suggests that opening new schools and charging fees to cover costs in areas where present travel times are equal to or greater than two hours may be welfare increasing. To see whether our analysis is correct the Peruvian government could test this on an experimental basis in a few selected rural areas.

This paper represents a first attempt to rigorously evaluate the feasibility of charging user fees for publicly provided education. The technique involved is relatively flexible. One possible criticism of this study is that information on the direct prices of schooling were lacking and had to be crudely estimated. Future data collection efforts should concentrate on gathering such data as well as data on the quality of schools. Such data will allow for a more refined analysis of the consequences of raising user fees, including the relative effects on household welfare and school attendance of simultaneously raising fees and raising school quality.

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APPENDIX I

Effect of Local School Travel Time on Hours in School

In Section IV of the text it was argued that travel time to the local school should be treated as a school quality variable as well as a price variable. This appendix explains why this assumption has been made.

Holding other variables constant, when households that enroll their children in a local school face longer travel times to that school, the increased time required to travel to that school must impinge on other activities. One might expect that children would work fewer hours, so that the added travel time would reduce the consumption opportunities faced by the household. However, it may also be the case that longer travel time results in fewer hours spent in school among those student who are attending. This reduced classroom time would presumably result in less learning on the part of students and thus could be interpreted as a school quality effect. The data must be checked to see whether travel time has a negative effect on hours in school.

To examine this we regressed hours in school on a set of explanatory variables which include distance to the nearest secondary school. These estimates, which control for sample selectivity bias (cf Heckman, 1979) are given in Table A.1. The coefficient on travel time is significantly negative. Thus we use distance to school as a school quality variable in the model as well as part of the price of schooling.

TABLE A.1: Regression Estimates of Hours in School

Independent Variables	Dependent Variable: Hours in School	
	Coefficient	t-statistic
Intercept	38.909	0.93
Age	-3.110	-0.55
Age^2	0.079	0.41
Sierra Dummy Variable	3.573	2.10
Selva Dummy Variable	-1.356	-0.57
Female Dummy Variable	-1.378	-1.10
Travel Time (minutes)	-0.029	-4.42
Child Wage Rate	-1.589	-0.68
Lambda (coefficient on inverse of Mill's ratio)	1.353	0.45
R^2	0.08	
Number of Observations	445	

APPENDIX II

Estimates of the Demand for Schooling Using Predicted Work Hours

The cost of schooling as shown in Equation (7) of the text includes the hours of children's work lost due to school attendance. The estimates given in the text use the data from Table 3 to calculate the differences in hours worked between children in school and children not in school. This procedure could be criticized because it does not control for sample selectivity bias - i.e. the decision to go to school. The essential problem is that if children now in school were to leave school, the hours they would work may not be the same as those for children who are not in school. This appendix presents estimates of the demand for schooling where selectivity is taken into account. It turns out that the estimates are very similar to those given in the text.

Table A.2 presents estimates of hours worked both for students and non-students where selectivity bias is using a method developed in Lee (1983). The method is a generalization of the two-step procedure popularized in Heckman (1979). The first stage estimates a reduced form nested multinominal logit model of schooling choice. The estimates from the first stage are then used to construct selectivity correction terms to include in least squares regressions of hours worked conditional on being in school and out of school. There is some evidence that selectivity exists, but it is very imprecisely estimated. These estimates were used to predict hours worked under the two different regimes (student and non-student), which were then used to calculate the cost of schooling for estimation of the demand for schooling. The new estimates of the demand for schooling are given in Table

A.3. The t-statistics have not been corrected to account for the the fact that hours are calculated from the estimations shown in Table A.2. It is clear, though, that there is little difference in the point estimates of the demand for schooling when compared to those given in Table 6 of the text. We also calculated arc price elasticities and willingness to pay measures which are presented in Tables A.4 and A.5 respectively. These estimates are also very similar to their counterparts in Tables 7 and 8 of the text. We thus conclude that sample selectivity is not a problem in the estimates we have presented.

TABLE A.2: Estimates of Hours Worked by Students and Non-Students

Independent Variables	Dependent Variables			
	Hours Worked by Non-Students		Hours Worked by Students	
Constant	-88.76	(-0.68)	29.12	(0.40)
Sex	5.58	(1.67)	0.16	(0.04)
Age	21.42	(1.30)	2.71	(0.28)
Age Squared	-0.63	(-1.24)	-0.13	(-0.39)
Year in School	-5.62	(-1.20)	2.03	(1.60)
Father's Years of Schooling	0.65	(0.95)	0.39	(0.79)
Mother's Years of Schooling	-2.62	(-2.10,	-1.93	(-3.30)
Sierra	7.15	(1.42)	4.70	(-1.29)
Selva	-1.60	(-0.27)	-2.92	(-0.52)
Log of Child Wage Rate	8.88	(1.82)	12.34	(3.32)
Adult Female Wage Rate	-1.24	(-0.23)	-12.83	(-2.59)
Adult Male Wage Rate	-9.64	(-1.64)	-3.24	(-0.64)
Log of HH Enterprise Assets	-1.37	(-2.46)	0.36	(0.94)
Log of HH Non-Labour Income	-14.86	(-1.96)	2.01	(1.65)
Log Hectares Owned by HH	0.52	(0.35)	1.39	(1.32)
Log of Business Assets	1.22	(1.91)	-0.19	(-0.39)
Males in HH Aged 20-60	-7.25	(-2.52)	1.57	(0.69)
Females in HH Age 20-60	-10.29	(-3.09)	-4.87	(-2.15)
Other Adults in Household	3.55	(1.65)	-1.88	(-1.39)
Children in HH Aged 7-12	-3.61	(-2.68)	0.52	(0.46)
Children in HH Aged 13-17	-2.74	(-1.12)	1.76	(1.05)
Seasonal Dummy Variables: Fall	1.85	(0.45)	-6.76	(-2.04)
Winter	-2.15	(-0.48)	11.22	(3.10)
Spring	1.06	(0.26)	5.68	(1.69)
Coefficient on Inverse Mill's Ratio	12.23	(0.98)	7.20	(1.44)
R^2	0.32		0.24	
Sample Size	212		306	

TABLE A.3: **Nested Multinominal Logit of Demand for Schooling**

Variable	Coefficient	t-statistic
Consumption (α_1)*	0.60	2.21
Consumption Squared (α_2)**	-0.03	-2.26
Sigma (σ)	0.75	3.26
Local School Alternative:		
Constant	-4.18	-2.60
Year in School	0.64	2.31
Female Child	-0.86	-2.50
Father Years Education	0.21	1.41
Mothers Years Education	0.19	2.00
Mother Years x Fathers Years	0.00	-0.07
Children Aged 13-17	-0.23	-1.54
Travel Time	-0.33	-4.66
Lack of Teachers	-0.64	-1.82
Far Away School Alternative:		
Constant	-6.10	-3.69
Year in School	1.07	3.60
Female Child	-0.79	-2.15
Father Years Education	0.11	0.65
Mother Years Education	0.17	1.69
Mother Years x Fathers Years	0.00	0.00
Children Aged 13-17	-0.51	-3.22

- Log likelihood = 621.65
Sample Size = 718

* Variable divided by 100 for estimation
** Variable divided by 10,000 for estimation

TABLE A.4: Arc Price Elasticities for Secondary Education

Price Range	Poorest 25%	Next 25%	Next 25%	Wealthiest 25%	All Rural Areas
Local School Attention					
0-300 Intis	-1.17	-.17	-.16	-.10	-.15
300-600 Intis	-.31	-.30	-.30	-.16	-.27
600-900 Intis	-.47	-.46	-.44	-.23	-.40
900-1200 Intis	-.64	-.62	-.59	-.31	-.53
Faraway School Alternative					
0-300 Intis	-.24	-.23	-.22	-.12	-.20
300-600 Intis	-.42	-.40	-.39	-.18	-.35
600-900 Intis	-.60	-.58	-.55	-.25	-.49
900-1200 Intis	-.79	-.7[illegible]	-.72	-.32	-.63

TABLE A.5: Willingness to Pay to Reduce Travel Time to Secondary School

Time to Nearest School	Income Quartile								All Rural Peru	
	Poorest 25%		Next 25%		Next 25%		Wealthiest 25%			
	A	B	A	B	A	B	A	B		
1 hour	139	1.9%	146	1.1%	155	0.7%	207	0.4%	164	0.8%
2 hours	965	13.3%	988	7.5%	1,011	4.8%	1,151	2.3%	1,034	5.0%

A - Willingness to Pay in June 1985 Intis per year.

B - Willingness to Pay as a percentage of household income.

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