CHILD LABOR AND SCHOOLING DECISIONS IN URBAN AND RURAL AREAS: CROSS-COUNTRY EVIDENCE

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Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Montreal, Canada, July 27-30, 2003

Acknowledgements: I would like to thank James Garrett, Harold Alderman, John Maluccio, and Futoshi Yamauchi for helpful comments on an earlier draft of this paper. All remaining errors are my own.

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Abstract

Child labor is widespread in developing countries, but its causes are debatable. Poverty is considered the primary reason, but many theoretical and empirical analyses show that other factors, such as access to credit, school quality and labor market opportunities, play equal or even greater roles in child labor and schooling decisions. This study surveys the existing literature and, taking into account urban-rural divides, aims to shed light on the debate with empirical evidence from Nepal, Peru, and Zimbabwe. We find that while there is strong evidence that poverty drives child labor in rural areas, there is a general lack of support for poverty hypothesis in urban areas. This suggests that policies such as a ban on child labor in rural areas could have an adverse effect, as child labor decisions are more likely a response to poverty and subsistence requirements. Similarly improving access to credit has greater potential for alleviating child labor and enhancing school enrollment in rural than urban areas, particularly in Nepal and Zimbabwe. On the other hand, the availability of alternative childcare options appears to considerably decrease child labor and create conditions for higher school attendance rates in urban than rural areas. Finally, the evidence from all three countries indicates that efforts to bolster adult educational levels and wages will help curb the prevalence and intensity of child labor and improve the likelihood that children stay in school.

Key Words: Child Labor, Child Schooling, Poverty, Nepal, Peru, Zimbabwe
JEL Classification: D1, I2, J2

1. Introduction

The rate of economic growth crucially depends on the stock of human capital in a country (Romer 1987; Lucas 1988; Barro 1991; Mankiw et al. 1992). A low level of human capital development has long been identified as a major impediment to economic growth and the elimination of poverty in developing countries. Several studies (e.g., Vijverberg 1993; Glick and Sahn 2000) find high returns in the labor markets for investments in education for both men and women. Glick and Sahn (1997) show that the earnings of women and men increase with schooling in both self-employment and wage employment by using data from a developing country. Similarly, other studies have consistently shown that child education has higher returns than other physical assets (e.g., Psacharopoulos 1994). Despite these apparent benefits and high potential returns to education, the level of education and educational attainment remain remarkably low in most developing countries, and child labor, considered to be a competing activity to schooling, continues to be a common phenomenon.

Child labor is widespread in developing countries. Estimates by the International Labor Organization (ILO 1996) of the number of children under age 15 who work ranges from 100 to 200 million. UNICEF (1991) estimated that there were 80 million children ages 10–14 who undertook work so long or arduous that it interfered with their normal development. Though many, including parents themselves, agree that childhood is a period of school learning and physical and mental development—and not of primarily income-generating work—many young children in low-income countries participate in the labor force, and their chance of receiving even primary education is minimal.

The causes of child labor are debatable, although poverty is considered as the primary reason. That there is a higher geographic concentration of child workers in poor countries (see

Basu 1999) indicates the inverse association of child labor and income. Basu and Van (1998) argue that the mass phenomenon of child labor does not reflect the selfishness of parents wanting to enjoy more leisure time while their children work, but rather that poverty compels them to send their children to work. For poor households, school investment decisions are associated with a host of decisions regarding use of time and other resources. Changes in household circumstances, such as becoming poor, may elicit important time-use changes, not only of children who are students or potential students, but of parents as well. In developing countries, often more than one member of the household generates income (e.g., Ersado 2002 on Zimbabwe; Pradhan and Soest 1997 on Bolivia), which often necessitates the use of child labor. Several studies that looked at schooling determinants in developing countries find that household wealth figures prominently in child schooling and work decisions (e.g., Basu and Van 1998). Bhalotra (2000a) finds that in Pakistan child work is caused by poverty.

Studies, citing evidence mainly from Latin America, argue that the rates of child labor are higher at times when children have better work opportunities as measured by local labor market conditions (Levison, Moe, and Knaul 2001; Binder 1999). Since the seminal paper by Becker (1964), many development researchers have recognized the importance of opportunity costs in schooling decisions. The opportunity costs of schooling increases as market wages for child labor increase. Furthermore, differences in labor market conditions by gender may differentially affect schooling decision for boys and girls.

Still others argue that factors such as credit market imperfection, not poverty, play a role in sending children to work or keeping them at home to take care of domestic household responsibilities, even though returns on education (which accrue in the future) are higher.[1] Cross-

[1] Ranjan (1999), using a two-period overlapping generation model, shows that credit constraints, not poverty, play a role in a household's decision to use child labor instead of sending their children to school.

sectional data from India and other developing countries show that a higher incidence of poverty is not correlated with a higher incidence of child labor (e.g., Swaminathan 1998). The Becker model and more recently Ranjan (2001) imply that income does not matter if complete credit markets exist. A study by Jacoby (1994) finds that borrowing constraints negatively affect children's schooling attainment in Peru. Studies also exist which suggest that child labor decision is part of household's risk-management strategy (Jacoby and Skoufias 1997; Grootaert and Kanbur 1995). Lack of access to credit for smoothing income fluctuations over time might, therefore, lead to a higher prevalence of child labor. Jacoby and Skoufias (1997) use a measure of variability of household income in rural India and find that school attendance declined with income variability.

Lack of access to school and low school quality could also affect child schooling and work decisions. For households rationally maximizing welfare, low demand for schooling might arise because of low school quality or excessive costs. Inaccessible or poor quality schools thus may spur parents to engage their children in more immediate and profitable pursuits (e.g., Grootaert and Patrinos 1999). Schooling costs—since schooling is the main competing activity for children's time—could also be an important determinant of child labor (e.g., Siddiqi and Patrinos 1995). Some children may have to work to afford the direct costs of schooling. Even with sufficient access to school, child labor may still continue to be a common phenomenon if the household decision making process gives more weight to income from child's labor and less weight to child's schooling because of other factors such as poverty (Grootaert and Kanbur 1995).

While labor is the poor's greatest asset, child labor raises important concerns. A household's decision to increase the number of family members in the labor market implies that

mothers might have to give up vital household and childcare activities, and children might have to sacrifice their education in order to participate in income generating activities. When the poor depend on their children's labor rather than invest in their future by educating them, they risk perpetuating poverty from one generation to the next (Moser 1996). It is important to understand the tradeoffs that households make between child labor-market participation and other vital time allocation decisions such as schooling and household work.

The evidence briefly summarized here shows a lack of consensus on the causes of child labor and suggests that its determinants may vary across geographic regions. It also casts doubt on the notion that child labor is primarily caused by poverty. This paper, using household survey data from three geographic regions (Africa, Asia, and Latin America), investigates the factors driving child labor by collecting cross-country evidence on child labor force participation and education-related decisions. It specifically asks questions such as: Does child labor mainly arise as a response to low income, lack of access to credit, an improved labor market, or poor school quality? Do we see differences in sub-Saharan Africa, Latin America, and Southeast Asia? Are urban-rural differences important in child labor and schooling decisions? Empirical models that simultaneously consider several factors affecting labor participation and schooling decisions are scant. Yet identifying the key determinants of child labor and schooling are of paramount importance to targeted policy and program designs to address current and future poverty.

2. Data and Descriptive Analysis

We use data from Nepal, Peru, and Zimbabwe to examine the key determinants of child labor participation and schooling decisions. The data are from the 1990/91 Zimbabwe Income Expenditure Consumption Survey (ZICES), the 1994 Peru Living Standards Measurement

Survey (PLSS), and the 1995 Nepal Living Standards Survey (NLSS). The surveys are nationally representative, lending themselves for comparison on individual, household, and community-level characteristics. The PLSS covers about 3,623 households, the NPLSS 3,373 households, and the ZICES over 14,000 households. The Nepal and Zimbabwe surveys report child schooling and employment data for 3,617 and 15,467 children ages 10–17, respectively. The Peru sample contains child labor and child schooling information for 5,191 children ages 6–17.[2] These large-scale household surveys provide information about children who work or do not work and those who attend or do not attend school, thus enabling us to model child labor and schooling decisions. We anticipate that the results based on more than one country will help solidify or weaken the presumption that poverty drives child labor.

Before discussing the descriptive results, it is important to describe how child labor is measured. The measurement of child labor depends on how it is defined and by ethical and cultural views. For some, all nonschool, nonleisure activities of children constitute child labor. Others define it only as only full-time employment in economic activities or as "bad" child labor such as backbreaking work in quarries or mines. This paper defines child labor as hours in both wage and nonwage activities, as reported by these multipurpose and countrywide household surveys. This is in line with Skoufias and Parker (2002), who argue that such a broad measure provides a more accurate estimate of the household preferences toward leisure.

Child Schooling and Employment Distribution by Age

Tables 1–3 show child employment and school enrollment rates for Nepal, Peru, and Zimbabwe by age, sex, and location. While nearly all children in Peru and Zimbabwe appear to

[2] To facilitate comparison among countries, only Peruvian children ages 10–17 (about 3,599 children) are considered in this paper.

enroll in school, about a quarter of Nepalese children have never been to school. For all age groups, current school attendance rates are lowest in Nepal (64 percent), followed by Zimbabwe (86 percent) and Peru (92 percent). Lower enrollment rates for Nepalese children may reflect a lack of access to schools, but those enrolled appear to stay in school more than both Zimbabwean and Peruvian children.

The data from all countries show lower enrollment and higher employment rates in rural compared to urban areas. Disaggregating by age and sex shows that enrollment rate difference by gender grows wider with age in the Zimbabwe than in either Peru or Nepal. While this is the case for both urban and rural areas in Zimbabwe, rural areas of Peru and Nepal show the biggest disparity in enrollment rates between boys and girls. This evidence is suggestive of more favor for schooling of boys than girls in rural areas, while school enrollment rates in urban areas do not appear to show a significant gender bias.

On the other hand, child employment rates go in an opposite direction to enrollment, possibly suggesting that dropping out of schools is at least partly driven by employment decisions. In all countries, labor force participation grows with age. In urban areas overall, employment rates are higher for boys than for girls in Peru and higher for girls than for boys in Zimbabwe. In rural areas, female employment rates appear to be higher than they are for boys in Zimbabwe, while the opposite is the case in Peru. For all age groups and in both urban and rural areas, child employment rates are highest in Peru, closely followed by Nepal, and the lowest in Zimbabwe. This is particularly true in rural areas: while nearly half of Peruvian and Nepalese children are engaged in some kind of employment activity, less than 12 percent of Zimbabwean children claim to do so.

Child Time Allocation by Residence and Sex

Table 4 presents child time allocation to schooling, employment, or both, by residence and gender. A large proportion of Peruvian children undertake both schooling and employment activities simultaneously. Interestingly, however, the proportion of children who both work and go to school is higher than that of those who are employed only. In all countries, rural children are more likely to go to school and work at the same time than are their urban counterparts. With regard to gender, fewer girls than boys attend school full time, and more girls than boys are employed full time and combine employment with schooling.

The Role of Children in the Household

The means of selected household and community characteristics variables are presented in Table 5. At the household level, men's share of household income is highest in Nepal, followed by Zimbabwe and Peru. In all countries, women's and children's share of household income grows, while the corresponding share for men's tends to shrink in urban areas. Children's share of household income is largest in Nepal, while there is a negligible difference between those of Peru and Zimbabwe. Rural children in Zimbabwe contribute more to household income than do their urban counterparts. Similarly, in rural Nepal, children contribute a nontrivial 7 percent of household income, compared to only 3 percent for their urban counterparts. It should be noted that quantifying the share of child-generated welfare for a household would be difficult and may be easily underestimated since children contribute in several ways that are not reflected in monetary terms. In addition, the data may be deficient due to a high likelihood of underreporting of the incomes generated by even gainfully employed and remunerated children (Basu 1999).

Table 5 also presents the ratio of children's labor hours to both men's and women's in the household. Child labor participation in all countries is closely related to their relative contribution to household income. Child labor participation is lowest in Zimbabwe, as is their share in overall household income. Urban-rural disparities are interesting: the ratio of child labor hours to both men's and women's is larger in rural areas in all countries, underscoring the abundance of child labor in rural household chores. However the urban child-labor environment is still alarming, with the ratio of child labor hours to adult labor hours in excess of 1 to 10 in both Peru and Nepal. The descriptive statistics suggest that the rate of incidence of child labor varies from country to country and by urban and rural areas within countries, but all country evidence confirms that the numbers of children working are high and worthy of policy concern.

3. Empirical Framework

The conventional welfare economics approach provides a useful framework for integrating determinants of child labor and schooling decisions. The decision is guided by utility maximization determined by consumption and leisure of household members, under household budgetary and time constraints (see Appendix 1). A parent's decision to send a child to school, work, or both is a time allocation decision. Thus the decision whether a child works or goes to school is a joint one as both activities are competing for child's time. We use a bivariate probit model to examine the interdependency between child labor and schooling decisions (see Appendix 1).[3] In this section, we describe the explanatory variables and address econometric issues pertinent to child labor and schooling choices.

[3] See Greene (1997) for a good description of bivariate probit model and Canagarajah and Coulombe (1998) for an application to child labor and schooling decisions.

Explanatory Variables and Endogeneity Issues

In line with the objectives of the paper and the conceptual model presented in Appendix 1, an extensive list of explanatory variables was used to examine the relative role of several individual, household, and community variables on child schooling and work decisions. The explanatory variables include measures of labor market conditions, poverty, credit access, school availability and cost, and variables accounting for household domestic responsibilities. These variables are considered as determinants of child labor in the literature, but there is general lack of consensus as to which is most important. We anticipate that the role of these variables varies significantly between rural and urban areas. In the following we briefly discuss the measurement and rationale for selection of the main explanatory variables.

Child- and adult-labor market conditions are measured by average wage paid per hour at the community level, not wage rates derived at individual levels. Community-level average wages provide a better description of prevailing labor market conditions than individual-level wages, and they are based on wages reported by individuals who actually work. Furthermore, being community-level averages, they are less prone to endogeneity problems. Since incomplete pooling of resources among household members appears to be the norm in many countries (Strauss and Thomas 1995), we include adult female and male wage variables separately. Explicit inclusion of separate wage and educational level variables would allow us to capture the differential impacts of men's and women's income, preferences and bargaining power on work and schooling decisions for their children.

Access to credit is found to be very difficult to measure from Living Standard Measurement Surveys (LSMS), which usually ask if a given household had a loan and bank account. Having a loan alone is not a good measure of access to credit since households who did

not report receiving a loan might have access to credit but no need to borrow. Note also that credit constraints are more likely to bind for the poor since their incomes are low and riskier, thus making access to credit potentially endogenous to schooling and work decisions. As a result, only access to a commercial branch bank at the community level is used as a measure of access to credit market. Since this still is not a significant measure of access to credit, the results should be interpreted with caution.

Other common determinants that figure prominently in child labor empirical work, such as parent's educational level, head age, and sex are among the explanatory variables. We also include a measure of "domestic responsibilities" in terms of the number of very young children in the household. This may adversely affect child schooling decisions and may be even more detrimental to schooling of girls. It is widely accepted that girls are more likely than boys to help their mothers with housework and childcare. Gender disparities in education could also arise due to differences in expected earnings or remittance propensities among boys and girls. The inclusion of a child gender dummy will address these and other possibilities that lead to differential employment and enrollments rates among boys and girls. Another variable of interest is whether the mother works outside the home, which may be correlated with child working decisions; a dummy variable that indicates if a mother works outside the home is used to capture this effect.

Some school-related variables at community level—the number of schools available and the cost of schooling per pupil—are included among explanatory variables. Availability of school can affect schooling decisions to the extent that child-time spent going to and from school entails a significant opportunity cost to the parent. Educational expenses per pupil could be a good measure of educational resources available to students as well as their teachers in terms of

facilities, tuition, books, and other school related expenses. Thus the cost of schooling is included because it could be an important determinant of the likelihood that children work. The inclusion of regional dummies and community-level characteristics variables help capture variation in productivity, labor demand, and differences in other aspects such as culture and attitude. All right-hand side variables are carefully selected in such a way that consistent reduced-form estimation is achieved by excluding potential endogenous variables.[4]

Finally, in accordance with the conceptual model in Appendix 1, the household-level poverty measure is based on nonwage income from various sources such as profits from self-employment in farming and nonfarming activities, interest from household assets, and other nonlabor income sources. This measure takes into account the intertemporal nature of child schooling and work decisions as shown in equations (A2) and (A3) in Appendix 1. However, nonwage income may be endogenous to child labor and schooling decisions, primarily due to that fact that children may contribute to nonwage income through involvement in family farming and nonfarming activities that do not pay wages.[5] But our measure is an improvement over most previous studies on child labor and schooling decisions that use total household income to measure poverty.

Although we anticipate that nonwage income suffers less from endogeneity problems compared to total household income, our empirical strategy addresses the potential endogeneity of nonwage income. Two regimes are estimated: one using nonwage income as a measure of poverty, and the other an instrumental variables estimation using household asset ownership as

[4] Specific household- or school-level variables are likely to suffer from endogeneity. For instance, household expenses on education are incurred only for children for whom the decision was made to enroll in school. Such variables are endogenous to child labor decisions. We circumvent this problem by averaging household-level, school-related variables over relevant geographic units in the survey or by using community level variables whenever possible.

[5] One might also argue that nonwage income represents the accumulation of assets related to labor income over the life cycle. However, this presents less of a problem when dealing with child labor income.

instruments for nonwage income. Following Smith and Blundell's (1986), we test if nonwage income is endogenous. The test involves testing the significance of the coefficient on the residuals from the first-stage regression of nonwage income on all instruments and exogenous explanatory variables. An extension of Smith and Blundell (1986)'s exogeneity test to bivariate probit case suggests that, under the null hypothesis, the residuals should have no or little explanatory power.

4. Results

The joint schooling and employment results are estimated with and without instrumenting for nonwage income. Both results are reported. Tables 6 and 7 present a bivariate probit and instrumental variables estimates for rural areas, while Tables 8 and 9 report the urban results. In general the coefficients on nonwage income appreciably reduces in its absolute magnitude after instrumenting, thus indicating an upward bias in the noninstrumented coefficient of household income.[6] The relevance test lends strong credence to our use of household asset holding as instrument for nonwage income in both rural and urban areas (with p-value < 0.0001).[7] The Smith and Blundell exogeneity test indicates that nonwage income is endogenous in the child labor and schooling decisions in both rural and urban areas, although the evidence is weaker in the latter.

The joint estimation of schooling and work is appropriate as the likelihood ratio tests of the hypothesis that the correlation between the error terms (ρ) is zero are soundly rejected for all

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[6] See Psacharopoulos (1997), Patrinos and Psacharopoulos (1997), Grootaert (1999), Grootaert and Patrinos (1999), Canagarajah and Coulombe (1998), and others for discussion on endoeneity of household income and potential upward bias in its coefficient. The upward bias may be due to the entanglement of substitution effects with income effects when some productive assets are used to proxy income (Bhalotra, 2000b).

[7] Bound et al (1995) suggest an *F* statistic of identifying instruments in the first-stage regression is useful indicators of the quality of the IV estimates.

cases except for Peru. A significantly negative ρ implies that some unobserved factors that increase the probability of attending school decrease the likelihood of working. Schooling and child labor are thus competing activities. On the other hand, schooling and working decisions appear rather noncompetitive in Peru, but there is insufficient evidence to claim they are complementary. The lack of significantly negative association between child schooling and work decisions in Peru is contrary to the common perception that child schooling is an inverse of child labor decisions. While the argument that anything that promotes school attendance is likely to dent child labor is quite sensible, the Peruvian case provides counterevidence that the two activities are not necessarily competitive. The descriptive statistics showed that the proportion of those children who work and go to school at the same is highest in Peru.

The intensity of work also merits attention since the hours of work could exhibit substantial variability among the children who are reported to be in the labor force. The intensity of work—hours of work per week—is estimated as a function of the same set of variables employed in the joint modeling of schooling and work decisions. It is estimated using tobit and instrumental variables (IV) tobit. The estimates of child labor supply are presented on Tables 10 and 11 for rural and urban areas, respectively. Factors that significantly affect child employment decisions affect the number of hours children actually work in the same direction. As such, intensity of work results are discussed concurrently with the joint schooling and work estimation. In the next sections child labor and schooling estimates are discussed focusing on the similarities and differences between cross-country results, and separately for rural and urban areas.

Rural Child Labor and Schooling Decisions

All country results indicate that child schooling is negatively associated with age and female gender, as girls' and older children's school attendance rates are significantly lower than those for boys and younger children. Correspondingly, the probability of being employed rises significantly with age in all three countries. The likelihood of employment also increases with girls in Nepal and Zimbabwe, but in Peru boys tend to have higher propensities for employment.

The impact of rural child labor market conditions on schooling and work, as measured by child labor wages at the community level, is effectively zero for all countries, casting doubt on the hypothesis that improved labor market conditions drive child labor in rural areas. On the other hand, evidence exists that improved labor market conditions for adult household members lead to higher school enrollment rates and less employment for Nepalese children, and lower employment rates for Peruvian children. Also higher wages for adult women in rural Zimbabwe are associated with a low prevalence of child labor.

In rural Nepal and Zimbabwe we find supportive evidence, from both instrumental and non-instrumental estimates, for Basu and Van's (1998) luxury axiom that states—"A family will send the children to the labor market only if the family's income from non-child labor sources drops very low." While poverty reduces the probability of child schooling, it significantly increases the prevalence of child labor and intensity of work. The labor supply estimates in Table 10 show that if a Nepalese household had its nonlabor assets increased by 100 rupees, it would decrease child labor hours by about 5.76 hours per week. Zimbabwean households would decrease child work hours by about 4.90 hours per week if there were a temporary positive shock (an increase of 100 Zimbabwe dollars) that would make liquidity constraints less binding. In

annual terms, these are significant reductions in child labor hours, as would be predicted by Basu and Van's (1998) model. If the household's decision to send children to work stems from survival concerns, as the evidence from rural Nepal and Zimbabwe indicates, the results suggest that parents would not send their children to work if their own wages were higher or employment opportunities wide enough to enable their incomes to surpass the subsistence threshold. In rural Peru nonwage wealth appears to have no impact on child labor and schooling decisions, thus provides neither support for nor evidence against the notion that poverty drives child labor.

Other household-level variables, such as the educational levels of both the highest educated man and woman in the family, significantly improve child education and decrease the likelihood of child labor and intensity of work in all three countries. This finding reinforces the widely accepted notion that parental education is the most consistent determinant of child education and employment decisions. Higher domestic responsibilities in terms of the number of young children under age 5 do not lead to a significant increase in the likelihood that their older siblings work. However, mothers working outside the home means a higher probability of child work in Nepal and Peru, although it also appears to improve child schooling in Nepal. The positive effect on child schooling of the mother working outside the home in rural Nepal may be explained by higher income effect, which makes it possible to pay for daycare and domestic help, so children are not necessarily taken out of school when their mothers work. But for lower income families, it is likely the case that a mother working outside the home means less schooling and more work for children.

Rural infrastructure and school-related community-level variables significantly affect schooling and work decisions in all countries. Higher average educational expenses at the community level appear to improve school enrollment rates and correspondingly decrease child

employment and intensity of work in rural Nepal and Zimbabwe. Similarly a higher number of schools in a given community lead to higher enrollment and lower employment rates and work hours per week in Nepal. Thus, to the extent that the number of schools and school-related expenditures in terms of tuition, books, teacher salaries, fewer students per teacher, etc. are indicators of access to school and school quality, improving the availability of good schools could lead to less child labor and more schooling.

In rural Nepal and Zimbabwe, access to a commercial bank has a positive effect on child schooling and a negative impact on child labor. Access to credit appears to have higher negative effect on employment than its corresponding positive effect on schooling. This may imply that credits are sought more to smooth consumption and other household needs than for child schooling purposes. Rural credit needs are driven by incidental risks and for temporary shocks, more so than a long term goal of child schooling. This may imply that in the absence of such credit schemes, child labor may become part of a strategy to minimize the risk of interruption of income stream. This finding is in concurrence with Jacoby and Skoufias's (1997) and Sawada's (1999) empirical evidence that children are taken out of school in response to household income shocks in rural India and Pakistan, respectively. In both rural Nepal and Zimbabwe we find evidence that access to credit reduces child labor and improve child school enrollment, thus supporting Ranjan's (1999) and Lahiri and Jaffrey (1999) argument that incomplete credit market could be driving child labor. In rural Peru, on the other hand, access to loan and banking services actually increases child employment and decreases schooling.

Urban Child Labor and Schooling Decisions

Similar to rural cases, in urban areas older children are less likely to go to school and girls are less likely to stay in school than boys in all three countries (see Tables 8 and 9). Child age continues to be positively correlated with the likelihood of employment and number of hours worked. However, the impact of gender on employment is mixed in urban areas: boys (girls) are more likely to be employed in Peru (Zimbabwe) and gender is insignificant in urban Nepal. Improved child labor markets provide strong incentives for child employment in urban Peru. The Peruvian result is comparable with findings in other Latin American countries that suggest improved market conditions drive child labor (see, for instance, Levison, Moe, and Knaul 2001 and Binder 1999). Peru has the largest proportion of children who are both working and going to school at the same time (see Table 4). The fact that child wage is positively associated with the employment decision may imply that some children work for the purpose of financing their education. The number of hours children work also increases significantly with child labor wages in urban Peru and Zimbabwe.

We do not find sufficient evidence from urban areas of all three countries for Basu and Van's (1998) luxury axiom that poverty drives child labor. Similar analysis done separately for boys and girls by Ray (2000a) also shows no evidence for poverty hypothesis in Peru. Although the theoretical literature on child labor, including Basu and Van's (1998), tend to lead many to believe that poverty is the primary cause of child employment, our result shows that poverty does not appear to be the main culprit of the prevalence of child labor in urban areas. While studies that lump together urban and rural areas obscure these differences, examining urban and rural child labor responses separately help shed a brighter light on the causes of child labor. We find

more evidence for poverty hypothesis in rural areas and less or no evidence for it in urban areas, as do Canagarajah and Coulombe (1998) in Ghana.

Household educational level variables, especially woman's education, continues to significantly reduce the probability of child labor and improve the likelihood of children being in school. Parental educational level has been critical in improving household livelihood and food and nutritional status of children (Ruel et al. 1999; Strauss and Thomas 1995). The urban result is similar the results from other studies that underline the importance that parental, especially mother's, education on children's human capital development.

A measure of domestic responsibilities, number of young children under age 5, plays a critical role in urban areas by keeping children away from school and forcing them into work. This result is in contrary to the rural result that showed its impact is insignificant. The urban result is consistent with the findings of Cochrane et al. (1990) who report the presence of children under five significantly reduces the educational participation of girls. Similarly a positive likelihood that a mother works outside the home leads to more child labor in all countries. This urban-rural differential in the impact of domestic responsibilities and mother work decision could be due to availability of extended family and kin networks to help in childcare activities in rural areas, as opposed to urban. Rural mothers may also have greater control over their time allocation for childcare and work due to the nature of their job such as working on own agricultural fields, while the urban women could be working in factories and under supervision of employers. The availability of alternative childcare options such as providing working mothers with firm-level childcare will likely have more impact in urban areas in terms of lessening the responsibilities born by school-age children in taking care of their younger siblings. It has been observed that the presence of a daycare center decreases the

likelihood that children engage in work at home (DeGraff et al. 1993; Goonesekere 1993). Also note that having a working mother does lead to significantly more hours of child work in urban areas of all countries (see Tables 11).

In Nepal and Zimbabwe, urban infrastructure and school-related community level variables do not factor in schooling and work decisions, unlike the rural areas. However, in urban Peru, educational expenses at the community level appear to improve child enrollment rates. Similar observations were made for another Latin American country by Brown (2001) who states that "…an increased cost of schooling is associated with a lower probability of work by Colombian children." Brown also suggests that, at least in the Colombian case, the cost of schooling is a proxy for school quality. The deficiencies in facilities, teacher salaries, and other educational supplies are reported to be pervasive in both rural and urban Peru (Brown 2001). For instance, Brown points out that even in metropolitan Lima, only 60 percent of schools have electricity. If school-related expenditures in terms of tuition, books, teacher salaries, etc. are plausible indicators of school quality in Peru, our empirical results suggest that improving school quality would likely keep more children in school.

5. Summary and Conclusions

The literature in child labor and schooling is voluminous and continually growing. However, studies are scant that simultaneously examine the various factors impacting child labor and schooling such as poverty, access to credit, labor market conditions, household domestic responsibilities, school expenditures, and parental educational levels, along with community characteristics important for such decisions. This paper looked at the impact of each of these factors while controlling for others at the same time. It examined urban and rural decisions

separately, with the anticipation that urban-rural differentials in livelihood strategies and opportunities could be reflected in child employment and schooling decisions. The simultaneous examination of a list of determinants of child schooling and employment decisions, while investigating their pertinence across countries and urban and rural areas within a given country, will enable to identify the factors that are more important than others.

In all three countries and urban and rural areas alike, parental educational levels are essential factors in child employment and education, with a significant contribution to reduction of child labor and improvement in the likelihood that children stay in school. In concurrence with empirical evidence from other Latin American countries, improved child labor market conditions in terms of higher wages per hour increases both the probability and intensity of work in urban Peru and Zimbabwe, with no appreciable effect in rural areas. Improvement in labor market conditions for adult labor leads to a lower probability of child labor and a higher probability of schooling. Bolstering adult wages may thus help curb child labor participation and increase the probability that children stay in school. Household domestic responsibilities and the likelihood that mother works away from the home have more significant impact on urban child labor and schooling decisions than on those of rural areas. This suggests that the availability of alternative childcare options would be more important in child labor decisions in urban than rural areas.

While poverty drives child work and schooling decisions in rural areas, it does not appear to significantly influence schooling and work participation rates in urban areas. In rural areas, policies such as a ban on child labor thus could have an adverse effect on both the household and the children because child labor decisions are more likely in response to poverty and subsistence requirements. The rural evidence thus is in line with the seminal paper on the economics of child labor by Basu and Van (1998).

Access to credit is likely to improve enrollment rates and decrease employment rates in rural areas of Nepal and Zimbabwe, in convergence with the theoretical results, for instance, by Ranjan (1999) and Lahiri and Jaffrey (1999). Credit constraints are more likely to be binding for the rural poor since their incomes are lower and riskier. Thus with better access to credit, the rural poor in Nepal and Zimbabwe may find it possible to borrow and send children to school. However, access to credit does not play a similar role in urban areas. Access to credit may have actually enabled rural Peruvian parents to overcome entry barrier and venture into own business activities in which child labor may be utilized when there are incomplete labor markets.

In sum, the evidence from Nepal, Peru and Zimbabwe indicates that the impact of poverty on child depends on location. While there is strong evidence that poverty drives child labor in rural areas, there is a general lack of support for poverty hypothesis in urban areas. Similarly improving credit access has greater potential for alleviating child labor and enhancing school enrollment in rural than urban areas particularly in Nepal and Zimbabwe. Finally, the evidence from all three countries indicates that the availability of good schools, and efforts to bolster adult educational levels and wages will help curb the prevalence and intensity of child labor and improve the likelihood that children stay in school.

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Appendix One

Child Labor and Schooling Decision: A Conceptual Framework

Assume that a household is composed of one parent and one child.[8] Assume also that a representative household lives for two periods and maximizes its utility function at time t:

$$U_t = U(C_t, L_{p,t}, L_{c,t}, S_{c,t}, \Phi_t) \qquad \text{(A1)}$$

where U is a concave utility function over joint consumption (C), child schooling (S_c), parent and child leisure times (L_p, L_c), and a vector of individual, household and community characteristics (Φ).[9] In period t, the parent decides whether to send his child to school or work. If work decision is made, the child earns wage W_c (a child wage) at period t and W_u (unskilled adult wage) at period $t+1$. If the parent instead decides to send his child to school, the child earns wage W_s (a skilled adult wage) in period $t+1$. The household's total resources thus depend on the parent's decision to send the child to work or to school in period t. Since child schooling and work decisions have intertemporal implications for the household, consider an intertemporal budget constraint:

$$A_{t+1} = A_t + \{\delta A_t + \Pi_t + Y_t + W_t E_{c,t} + W_t(T_p - L_{p,t}) - C_t\} \qquad \text{(A2)}$$

where A_t is total asset holding at the initial period; δ is the interest rate. $(\Pi_t + \delta A_t + Y_t)$ comprises nonwage income, which includes profits from self-employment in farm and nonfarm activities (Π), interest income from household assets (A_t) and transfers and other income from nonlabor sources (Y_t). W_t is a vector of wage rates for parent and child; T_p is total parent time; and E_c is child paid labor time. By denoting nonwage income by Ω_t and solving for it using (A2):

$$\Omega_t = (A_{t+1} - A_t) + \{C_t - (W_t E_{c,t} + W_t(T_p - L_{p,t}))\} \qquad \text{(A3)}$$

(A3) implies that an intertemporally consistent measure of nonwage income amounts to asset accumulation or decumulation, which allows agents to save (when Ω_t is positive) or dissave (when Ω_t is negative). This measure of nonwage income, which excludes earnings from child labor, could be used as an exogenous poverty measure in the estimation of child schooling and work decisions.

Finally the household is subject to a child-time constraint. In a typical developing country, child time may be allocated to three broad activities—schooling, leisure, and paid and unpaid labor:

[8] Households with more members can be considered without loss of generality

[9] Including child schooling in the parent's utility function assumes that education is both an investment and consumption good for parents (Becker and Lewis 1973).

$$T_c = L_{c,t} + S_{c,t} + E_{c,t} \quad \text{(A4)}$$

Maximizing (A1) subject to (A2) and (A4) would lead to a vector of optimal choices that are functions of prices, wages, household characteristics, income, and other factors:

$$\Gamma^*(W_t, \Pi_t, A_t, Y_t, \Phi_t) \quad \text{(A5)}$$

where Φ_t includes all community-level observed and unobserved characteristics that likely affect the parents' decision on child schooling and work such as credit opportunities, accessibility to school, school fees, and other factors. An indirect utility function that represents the maximum utility a household receives, under child schooling alone, schooling and work and work alone decisions, can be obtained by substituting the vector of choices in (A5) into the utility function in (A1) (suppressing time subscript):

$$V_j = V_j(\Gamma^*(W_j, \Pi, A, Y, \Phi)) \;\; j = u, s \quad \text{(A6)}$$

where V_s and V_u are utility under child schooling and work decision. Parents will decide to send children to school instead of work at time t if they are better off with the enhanced human capital, i.e., if and only if

$$(V_s - V_u) \geq 0 \quad \text{(A7)}$$

A parent's decision whether a child works or goes to school is a joint one as both activities are competing for child's time. We therefore use a bivariate probit to model child labor and schooling as joint decisions. Let y_1^* be the latent variable representing the decision to work and y_2^* represent the decision of schooling. Then, a bivariate probit specification will take the following general form:

$$\begin{aligned}
&y_1^* = X_1\beta_1 + \eta_u, \quad y_1 = 1 \;\; if \;\; y_1^* > 0, \;\; 0 \;\; \text{otherwise} \\
&y_2^* = X_2\beta_2 + \eta_s, \quad y_2 = 1 \;\; if \;\; y_2^* > 0, \;\; 0 \;\; \text{otherwise} \\
&E[\eta_u] = E[\eta_s] = 0, \; V[\eta_u] = V[\eta_s] = 1, \; C[\eta_u, \eta_s] = \rho \\
&[\eta_u, \eta_s] \sim BVN[0, 0, 1, 1, \rho]
\end{aligned} \quad \text{(A8)}$$

where X_1 and X_2 are vectors of explanatory variables which affect child work and schooling decisions; β_1 and β_2 are the associated parameters; η_s and η_u are error terms with normal distributions, and ρ is the coefficient of correlation between the two equations; E, V, C and BVN stand for expectation, variance, covariance and bivariate normal distribution functions, respectively.

Table 1. Enrollment and employment rates among Nepalese children in 1995/96

	Enrollment						*Employment*					
	Urban			Rural			Urban			Rural		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
10	85.7	79.2	82.6	77.7	52.8	65.3	7.1	13.2	10.1	20.6	31.6	26.1
11	86.8	87.9	87.3	78.3	64.3	71.0	5.3	0.0	2.8	26.8	34.5	30.8
12	85.9	77.3	82.4	71.4	48.5	61.1	12.5	15.9	13.9	38.5	48.5	43.0
13	85.1	71.8	79.1	75.2	50.3	64.5	17.0	20.5	18.6	40.2	49.7	44.3
14	80.7	69.1	75.0	64.8	46.4	54.8	19.3	18.2	18.8	50.6	53.1	52.0
15	79.6	75.5	77.6	56.1	35.5	46.5	24.5	18.4	21.4	55.6	66.3	60.6
16	54.2	73.3	63.4	49.5	34.3	42.1	33.3	26.7	30.1	58.7	63.2	60.9
17	73.8	65.8	70.0	42.4	33.3	37.9	31.0	18.4	25.0	59.7	66.7	63.2
Total	79.3	74.7	77.1	65.5	46.1	56.1	18.5	16.9	17.7	42.9	50.8	46.7

Table 2. Enrollment and employment rates among Peruvian children in 1994

	Enrollment						*Employment*					
	Urban			Rural			Urban			Rural		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
10	96.8	95.7	96.3	94.7	91.2	92.8	9.5	6.0	7.8	55.8	35.4	44.7
11	99.3	96.6	98.1	94.4	90.7	92.4	12.5	8.5	10.7	62.2	37.4	48.7
12	96.9	96.3	96.6	88.6	91.3	90.0	10.9	8.9	9.8	71.4	48.1	59.8
13	97.1	91.0	93.9	89.7	80.4	84.7	14.0	11.1	12.5	61.5	50.0	55.3
14	95.6	91.3	93.3	75.0	78.3	76.5	26.3	14.3	19.8	76.0	62.7	69.9
15	88.8	85.2	87.0	78.2	67.1	72.5	31.3	14.1	22.7	78.2	61.0	69.4
16	84.9	77.1	81.1	71.4	58.1	63.8	29.5	18.6	24.1	89.3	59.5	72.3
17	62.1	59.6	60.8	60.0	37.7	49.0	39.3	16.3	27.0	82.5	44.2	63.7
Total	91.9	88.3	90.1	84.5	82.4	83.4	15.1	9.2	12.1	56.6	40.1	48.0

Table 3. Enrollment and employment rates among Zimbabwean children in 1990/91

	Enrollment						*Employment*					
	Urban			Rural			Urban			Rural		
Age	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
10	98.4	99.3	98.9	95.7	95.6	95.7	0.4	1.1	0.8	3.0	2.6	2.8
11	98.7	98.6	98.6	95.1	96.4	95.8	0.9	0.0	0.5	3.1	2.7	2.9
12	99.0	96.5	97.8	94.6	93.5	94.0	0.5	1.5	1.0	5.1	4.4	4.8
13	97.5	98.6	98.1	92.1	91.6	91.8	1.0	1.4	1.2	4.9	6.5	5.7
14	94.8	91.0	92.6	89.7	83.3	86.7	1.1	5.6	3.7	7.9	13.5	10.5
15	97.0	78.6	87.5	81.9	67.4	75.1	1.5	14.1	8.0	13.9	24.5	18.8
16	88.9	70.9	78.5	76.0	60.3	68.4	2.4	18.4	11.6	17.4	32.6	24.7
17	75.8	54.1	64.2	64.8	51.3	58.5	3.2	25.5	15.1	27.4	39.7	33.1
Total	93.9	85.4	89.4	87.1	82.0	84.6	1.3	8.8	5.3	9.7	14.1	11.8

Table 4. Children time allocation into employment, schooling, and/or both

	Nepal			Peru			Zimbabwe		
				By Residence					
Activity	All (%)	Rural (%)	Urban (%)	All (%)	Rural (%)	Urban (%)	All (%)	Rural (%)	Urban (%)
Schooling	52.4	46.6	75.8	64.6	42.4	78.7	87.0	85.9	90.9
Employment	26.8	30.8	10.6	5.6	10.1	2.8	8.3	10.0	2.8
Both	11.8	13.6	4.6	20.3	37.7	9.4	0.4	0.3	0.5
Neither	9.0	9.0	9.1	9.5	9.8	9.2	4.3	3.9	5.9
Total	100	100	100	100	100	100	100	100	100
				By Sex					
Activity	All (%)	Boys (%)	Girls (%)	All (%)	Boys (%)	Girls (%)	All (%)	Boys (%)	Girls (%)
Schooling	52.4	59.5	44.9	64.6	67.2	62.0	87.0	89.8	84.2
Employment	26.8	21.2	32.6	5.6	4.7	6.6	8.3	6.1	10.6
Both	11.8	14.5	9.1	20.3	15.5	25.4	0.4	0.3	0.4
Neither	9.0	4.8	13.4	9.5	12.7	6.1	4.3	3.8	4.8
Total	100	100	100	100	100	100	100	100	100

Table 5. Means of selected variables

	Nepal			Peru			Zimbabwe		
	All	Urban	Rural	All	Urban	Rural	All	Urban	Rural
Household size	5.59	5.28	5.67	5.38	5.31	5.50	5.03	4.32	5.43
Urban (yes)	0.19	--	--	0.61	--	--	0.25	--	--
Child Sex (female)	0.48	0.45	0.49	0.51	0.50	0.52	0.50	0.52	0.49
Child age	13.28	13.33	13.3	13.5	13.62	13.18	13.2	13.40	13.18
Nonwage income per capita	6902	14614	5093	2358	2964	1315	44	51	40
Man's share of total income	0.81	0.72	0.82	0.73	0.69	0.79	0.75	0.84	0.65
Woman's share of total income	0.12	0.23	0.10	0.24	0.28	0.17	0.20	0.16	0.25
Child's share of total income	0.06	0.03	0.07	0.04	0.03	0.04	0.02	0.002	0.04
Ratio of child's to man's labor	0.27	0.13	0.31	0.12	0.08	0.19	0.06	0.02	0.08
Ratio of child's to woman's labor	0.30	0.26	0.31	0.36	0.26	0.49	0.11	0.05	0.12
Child ever been to school (yes)	0.68	0.86	0.67	0.99	1.00	0.98	0.99	0.99	0.99
Child attending school (yes)	0.61	0.80	0.60	0.85	0.88	0.80	0.88	0.91	0.87
Child employed (yes)	0.40	0.13	0.42	0.26	0.12	0.48	0.08	0.03	0.10
Community Level Characteristics									
School expenses [a]	82.9	217.2	66.1	106.5	137.5	42.8	28.4	65.19	18.07
Man's wage per hour	15.24	17.04	15.01	2.70	3.33	1.40	0.16	0.40	0.09
Woman's wage per hour	15.77	17.32	15.58	2.07	2.49	1.20	0.09	0.27	0.04
Child's wage per hour	9.37	8.56	9.47	0.93	1.05	0.67	0.05	0.10	0.04
Electricity (yes)	0.33	0.89	0.25	0.74	0.97	0.26	0.21	0.87	0.03
Water storage (1=best, 5=worst)	3.50	2.98	3.57	2.22	1.49	3.71	3.52	1.49	4.09

[a] monetary figures are nominal and presented at the year of survey and using respective currency of each country (i.e., rupes for Nepal, sols for Peru, and Z$ for Zimbabwe).

Table 6. Joint child and schooling decisions in rural areas

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1) Schooling	(2) Employment	(3) Schooling	(4) Employment	(5) Schooling	(6) Employment
Sex (female)	-0.679	0.172	-0.273	-0.624	-0.326	0.329
	(12.87)***	(3.44)***	(3.14)***	(8.63)***	(9.94)***	(9.50)***
Age	-0.153	0.200	-0.244	0.088	-0.262	0.244
	(12.69)***	(17.07)***	(12.09)***	(5.43)***	(32.97)***	(29.45)***
Child wage	0.037	-0.036	0.071	0.195	-0.165	-0.027
	(2.20)***	(2.40)***	(0.33)	(1.13)	(0.39)	(0.06)
Man's wage	0.009	-0.006	0.467	-0.680	-0.090	0.475
	(3.36)***	(2.40)***	(1.30)	(2.93)***	(0.25)	(1.24)
Woman's wage	-0.005	0.005	0.054	-0.253	0.460	-0.933
	(1.56)	(1.81)	(0.31)	(1.73)	(0.97)	(1.81)*
Nonwage income	.711	-0.306	0.507	-0.297	1.386	-1.624
	(10.67)***	(4.97)***	(0.73)	(0.49)	(4.05)***	(4.48)***
# Young children	-0.023	0.046	-0.043	-0.063	-0.036	0.049
	(1.13)	(2.35)*	(1.07)	(1.80)*	(2.55)**	(3.33)***
Head sex (female)	-0.155	-0.174	0.237	0.280	0.129	-0.115
	(1.79)*	(2.03)*	(1.58)	(2.11)**	(3.30)***	(2.80)***
Head age	0.041	-0.021	-0.050	0.020	-0.025	0.021
	(1.84)*	(0.98)	(1.25)	(0.58)	(1.95)*	(1.57)
Man's education	0.063	-0.034	0.166	-0.143	0.065	-0.069
	(8.89)***	(5.22)***	(2.49)*	(2.64)***	(6.52)***	(6.56)***
Woman's education	0.063	-0.048	0.154	-0.116	0.144	-0.111
	(5.28)***	(4.53)***	(2.36)**	(2.19)**	(12.82)***	(9.45)***
Mother works outside home	0.294	0.166	0.261	0.659	-0.340	0.403
	(3.43)***	(1.99)**	(2.22)**	(6.01)***	(3.72)***	(3.89)***
Community Level Variables						
Educational expenses	0.011	-0.016	1.550	0.375	1.257	-2.029
	(1.96)*	(2.92)***	(1.31)	(0.40)	(4.05)***	(6.20)***
Access to a bank (1=yes, 0=no)	0.081	-0.270	-1.959	2.870	0.289	-0.382
	(1.03)	(3.61)***	(1.30)	(2.57)*	(2.97)***	(3.71)***
Number of schools	0.052	-0.024				
	(5.80)***	(2.84)***				
Water storage (1=best, 5=worst)	-0.151	0.137	0.258	-0.132	0.238	-0.071
	(3.83)***	(3.72)***	(1.26)	(0.82)	(5.82)***	(1.58)
Electricity (yes)	0.096	-0.097	0.878	-0.846		
	(1.34)	(1.43)	(1.28)	(1.78)*		
Sewage disposal (1=best, 5=worst)			0.182	0.026		
			(0.87)	(0.16)		
Regional Dummies						
Rural West-Hill	0.188	0.049				
	(2.40)*	(0.65)				
Rural East-Hill	0.241	0.174				
	(2.87)***	(2.18)*				
Rural-West Tera	0.145	0.148				
	(1.58)	(1.68)*				
Siera North			-0.288	-0.251		
			(2.07)**	(2.11)**		

Table 6. (Continued…)

Siera Central			0.329	0.265		
			(2.10)**	(2.36)**		
Selva Alta North			-0.697	-0.205		
			(3.84)***	(1.23)		
Selva Alta South			0.289	-0.406		
			(0.89)	(1.54)		
Selva Baja			-0.675	0.331		
			(4.76)***	(2.75)***		
Coastal North			-0.156	-0.377		
			(0.86)	(2.44)**		
Coastal South			-0.458	-0.685		
			(1.22)	(1.66)*		
Mashonaland N					-0.135	0.146
					(2.08)**	(2.14)**
Mashonaland E					0.028	0.016
					(0.36)	(0.19)
Mashonaland W					0.141	-0.304
					(1.98)**	(3.94)***
Matabeleland N					-0.179	0.165
					(2.16)**	(1.92)
Matabeleland S					-0.247	0.311
					(3.30)***	(3.98)***
Midlands					0.175	-0.134
					(2.73)***	(2.01)**
Masvingo					-0.136	0.104
					(2.14)*	(1.56)
Constant	1.325	-2.400	1.542	-0.321	3.625	-4.217
	(4.27)***	(8.18)***	(1.07)	(0.31)	(15.52)***	(16.55)***
ρ	-0.760		0.025		-0.980	
Wald test	$X^2(40)=907.0^{***}$		$X^2(48)=457.5^{***}$		$X^2(44)=1548.6^{***}$	
Likelihood ratio test: ρ = 0	$X^2(1)=661.9^{***}$		$X^2(1)=0.1804$		$X^2(1)=4013.8^{***}$	
Observations	2879	2879	1395	1395	11523	11523

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7. Joint child and schooling decisions in rural areas, IV estimates

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1) Schooling	(2) Employment	(3) Schooling	(4) Employment	(5) Schooling	(6) Employment
Sex (female)	-0.644	0.134	-0.257	-0.660	-0.328	0.356
	(12.17)***	(2.68)***	(2.61)***	(7.92)***	(8.18)***	(8.42)***
Age	-0.167	0.203	-0.234	0.072	-0.277	0.257
	(13.20)***	(16.72)***	(8.57)***	(3.14)***	(27.8)***	(24.87)***
Child wage	0.005	-0.008	-0.030	0.342	0.557	-0.073
	(0.27)	(0.48)	(0.11)	(1.55)	(0.99)	(0.12)
Man's wage	0.010	-0.005	0.527	-0.751	-0.328	0.662
	(3.52)***	(2.00)**	(1.42)	(3.12)***	(0.71)	(1.38)
Woman's wage	-0.003	0.004	0.022	-0.154	1.444	-1.840
	(1.07)	(1.47)	(0.12)	(0.98)	(2.39)**	(2.82)***
Nonwage income (predicted)	0.747	-0.184	-0.143	0.196	0.746	-0.602
	(5.16)***	(1.72)*	(0.54)	(0.85)	(7.51)***	(5.78)***
# Young children	0.009	0.026	-0.102	0.019	-0.088	0.044
	(0.41)	(1.25)	(0.87)	(0.19)	(3.67)***	(1.78)
Head sex (female)	-0.157	-0.079	0.031	0.515	0.012	-0.016
	(1.84)*	(0.92)	(0.08)	(1.63)	(0.23)	(0.30)
Head age	0.085	-0.034	-0.035	-0.010	-0.012	0.021
	(3.88)***	(1.63)	(0.58)	(0.19)	(0.80)	(1.31)
Man's education	0.045	-0.030	0.198	-0.177	0.080	-0.084
	(5.15)***	(3.82)***	(2.09)**	(2.27)**	(6.57)***	(6.58)***
Woman's education	0.065	-0.051	0.217	-0.207	0.118	-0.079
	(5.57)***	(4.89)***	(1.72)*	(1.92)*	(8.56)***	(5.52)***
Mother works outside home	0.209	0.326	0.161	0.812	-0.089	0.157
	(2.45)**	(3.84)***	(0.81)	(4.54)***	(0.80)	(1.25)
Community Level Variables						
Educational expenses	0.038	-0.026	1.462	0.500	-0.654	-0.511
	(6.49)***	(4.72)***	(1.20)	(0.53)	(1.47)	(1.09)
Access to a bank (yes)	0.088	-0.283	-2.455	3.327	0.243	-0.404
	(1.12)	(3.76)***	(1.48)	(2.61)***	(2.03)**	(3.18)***
Number of schools	0.075	-0.039				
	(8.23)***	(4.66)***				
Water storage (1=best, 5=worst)	-0.160	0.133	0.280	-0.177	0.334	-0.146
	(4.01)***	(3.62)***	(1.36)	(1.10)	(6.04)***	(2.43)**
Electricity	-0.002	-0.090	1.064	-0.867		
	(0.03)	(1.29)	(1.48)	(1.73)*		
Sewage disposal (1=best, 5=worst)			0.184	0.075		
			(0.86)	(0.45)		
Regional Dummies						
Rural West-Hill	0.327	0.084				
	(3.94)***	(1.09)				
Rural East-Hill	0.433	0.095				
	(5.13)***	(1.18)				
Rural-West Tera	0.062	0.213				
	(0.67)	(2.39)**				
Siera North			-0.329	-0.185		
			(2.25)**	(1.48)		

Table 7. (Continued…)

Siera Central			0.436	0.166		
			(2.09)**	(1.02)		
Selva Alta North			-0.630	-0.273		
			(2.99)***	(1.45)		
Selva Alta South			0.382	-0.542		
			(0.99)	(1.68)*		
Selva Baja			-0.392	-0.021		
			(0.74)	(0.05)		
Coastal North			-0.201	-0.296		
			(1.07)	(1.83)*		
Coastal South			-0.062	-1.166		
			(0.08)	(1.67)*		
Mashonaland N					-0.194	0.242
					(2.44)**	(2.93)***
Mashonaland E					-0.297	0.246
					(2.81)***	(2.20)**
Mashonaland W					-0.118	-0.087
					(1.25)	(0.86)
Matabeleland N					-0.296	0.269
					(2.85)***	(2.51)**
Matabeleland S					-0.333	0.431
					(3.64)***	(4.54)***
Midlands					-0.096	0.086
					(1.12)	(0.97)
Masvingo					-0.427	0.360
					(4.76)***	(3.85)***
Constant	1.265	-2.703	1.932	-1.063	3.298	-4.043
	(4.00)***	(8.75)***	(1.14)	(0.84)	(10.4)***	(11.8)***
ρ	-0.769		0.031		-0.987	
Wald test	$X^2(42)=871.7^{***}$		$X^2(50)=458.0^{***}$		$X^2(46)=1119.2^{***}$	
Likelihood ratio test: ρ = 0	$X^2(1)=688.2^{***}$		$X^2(1)=0.275$		$X^2(1)=2835.0^{***}$	
Exogeneity test for nonwage income (F-test)	F-statistic =13.2 P-value < 0.01		F-statistic = 19.24 P-value < 0.001		F-statistic = 36.60 P-value < 0.001	
Test for relevance of instruments (F-test)	F-statistic = 13.99 P-value < 0.01		F-statistic = 17.90 P-value < 0.01		F-statistic = 22.17 P-value < 0.001	
Observations	2884	2884	1387	1387	8654	8654

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8. Joint child and schooling decisions in urban areas

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1) Schooling	(2) Employment	(3) Schooling	(4) Employment	(5) Schooling	(6) Employment
Sex (female)	-0.312	-0.179	-0.176	-0.367	-0.315	0.536
	(2.42)**	(1.30)	(1.97)**	(4.72)***	(4.39)***	(5.05)***
Age	-0.160	0.215	-0.262	0.144	-0.321	0.220
	(4.95)***	(6.14)***	(11.84)***	(8.04)***	(16.6)***	(9.26)***
Child wage	0.097	0.052	-0.063	0.157	-0.155	0.670
	(1.45)	(0.85)	(0.99)	(2.59)***	(0.54)	(1.92)*
Man's wage	0.040	-0.003	-0.084	-0.096	0.745	-1.821
	(2.91)***	(0.23)	(1.59)	(1.73)*	(1.11)	(1.82)*
Woman's wage	0.013	-0.013	-0.158	0.088	0.048	-3.259
	(2.24)**	(1.75)*	(1.68)*	(1.02)	(0.04)	(2.19)**
Nonwage income	0.015	0.020	-0.731	-0.213	-0.025	-0.087
	(0.33)	(0.39)	(2.15)**	(1.40)	(0.12)	(0.33)
# Young children	-0.158	0.136	-0.040	0.021	-0.089	0.116
	(2.32)**	(1.74)	(0.76)	(0.49)	(2.31)**	(2.20)**
Head sex (female)	-0.194	0.123	0.080	-0.033	-0.337	-0.114
	(0.94)	(0.56)	(0.65)	(0.31)	(3.28)***	(0.73)
Head age	-0.164	-0.001	-0.099	-0.068	0.081	-0.130
	(2.95)***	(0.01)	(2.34)**	(1.78)	(2.40)**	(2.90)***
Man's education	0.051	-0.045	-0.034	-0.002	0.023	-0.052
	(3.29)***	(2.61)***	(0.61)	(0.04)	(1.05)	(1.72)*
Woman's education	0.053	-0.053	-0.083	-0.250	0.092	-0.128
	(3.26)***	(2.92)***	(1.48)	(5.14)***	(4.02)***	(4.13)***
Mother works outside home	-0.024	0.372	0.049	0.598	-0.597	1.150
	(0.17)	(2.32)**	(0.47)	(5.82)***	(4.87)***	(4.40)***
Community Level Variables						
Educational expenses	0.005	-0.007	0.014	-0.001	0.241	-0.155
	(0.79)	(0.97)	(14.36)***	(2.56)**	(1.45)	(0.78)
Access to a bank (yes)	-0.364	-0.151	0.026	-1.915	-0.119	1.080
	(1.53)	(0.65)	(0.03)	(2.32)**	(0.32)	(2.04)**
Water storage (1=best, 5=worst)	0.217	-0.125	-0.013	-0.445	-0.164	0.514
	(2.80)***	(1.55)	(0.06)	(1.88)*	(0.70)	(1.62)
Electricity	-0.068	-0.726	1.071	-1.803		
	(0.16)	(1.93)*	(1.41)	(2.31)**		
Sewage disposal (1=best, 5=worst)			0.181	-0.118		
			(1.03)	(0.66)		
Regional Dummies						
Other Urban-Hill	0.444	-0.127				
	(1.95)*	(0.56)				
Other Urban-Tera	0.036	-0.240				
	(0.12)	(0.78)				
Lima North			0.201	-0.399		
			(0.94)	(1.90)*		
Siera North			0.207	0.503		
			(0.66)	(1.75)*		
Siera Central			0.695	0.259		
			(2.56)**	(1.07)		

Table 8. (Continued…)

Siera South			0.350	0.549		
			(1.36)	(2.36)*		
Selva Alta North			0.120	0.188		
			(0.38)	(0.63)		
Selva Alta Central			0.303	0.294		
			(0.73)	(0.93)		
Selva Alta South			-0.401	0.373		
			(1.31)	(1.22)		
Selva Baja			-0.425	0.704		
			(1.82)*	(3.13)***		
Coastal North			0.246	0.169		
			(1.04)	(0.72)		
Coastal Central			-0.112	0.662		
			(0.40)	(2.67)***		
Coastal South			0.196	0.326		
			(0.56)	(0.99)		
Bulawayo					-0.041	-0.057
					(0.23)	(0.24)
Mashonaland N					-0.099	-0.357
					(0.45)	(1.19)
Mashonaland E					0.124	-0.783
					(0.70)	(2.31)**
Mashonaland W					-0.063	-0.023
					(0.36)	(0.10)
Matabeleland N					0.226	-0.885
					(0.95)	(2.45)**
Matabeleland S					0.206	-0.166
					(0.91)	(0.56)
Midlands					0.034	-0.870
					(0.13)	(2.33)**
Masvingo					0.136	-0.484
					(0.51)	(1.39)
Constant	1.332	-2.607	4.234	0.151	5.978	-6.280
	(1.34)	(2.80)***	(3.50)***	(0.12)	(8.96)***	(7.21)***
ρ	-0.77		-0.1280		-0.87	
Wald test	$X^2(40)=175.0^{***}$		$X^2(58)=566.8^{***}$		$X^2(46)=385.0^{***}$	
Likelihood ratio test: ρ = 0	$X^2(1)=78.3^{***}$		$X^2(1)=3.4479^{*}$		$X^2(1)=242.6^{***}$	
Observations	700	700	2203	2203	3492	3492

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9. Joint child and schooling decisions in urban areas, IV estimates

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1) Schooling	(2) Employment	(3) Schooling	(4) Employment	(5) Schooling	(6) Employment
Sex (female)	-0.313	-0.170	-0.273	-0.477	-0.348	0.604
	(2.43)**	(1.23)	(2.89)***	(4.78)***	(4.43)***	(5.15)***
Age	-0.161	0.215	-0.234	0.193	-0.340	0.234
	(4.98)***	(6.13)***	(9.52)***	(5.26)***	(15.3)***	(9.05)***
Child wage	0.097	0.055	0.008	0.225	-0.478	0.682
	(1.43)	(0.90)	(0.13)	(3.05)***	(1.32)	(1.73)*
Man's wage	0.040	-0.003	-0.030	-0.027	0.342	-3.163
	(2.90)***	(0.21)	(0.54)	(0.39)	(0.46)	(2.79)***
Woman's wage	0.013	-0.013	-0.072	0.205	-0.189	-4.557
	(2.24)**	(1.75)*	(0.75)	(1.82)*	(0.13)	(2.42)**
Nonwage income (predicted)	0.013	-0.007	-0.814	-0.879	0.029	-0.028
	(0.15)	(0.07)	(5.86)***	(1.59)	(1.03)	(0.75)
# Young children	-0.160	0.134	-0.147	-0.069	-0.050	0.123
	(2.33)**	(1.70)	(2.65)***	(0.92)	(1.09)	(2.00)**
Head sex (female)	-0.194	0.106	-0.073	-0.217	-0.306	-0.098
	(0.92)	(0.47)	(0.55)	(1.35)	(2.50)**	(0.55)
Head age	-0.166	0.005	0.038	0.074	0.092	-0.128
	(2.95)***	(0.08)	(0.76)	(0.76)	(2.24)**	(2.38)**
Man's education	0.051	-0.044	-0.087	-0.042	0.008	-0.059
	(3.24)***	(2.49)**	(1.45)	(0.76)	(0.28)	(1.45)
Woman's education	0.053	-0.052	0.048	-0.073	0.082	-0.111
	(3.13)***	(2.72)***	(0.74)	(0.62)	(3.25)***	(3.25)***
Mother works outside home	-0.024	0.362	-0.058	0.446	-0.592	1.033
	(0.16)	(2.24)**	(0.53)	(3.37)***	(4.44)***	(3.87)***
Community Level Variables						
Educational expenses	0.005	-0.005	0.017	0.001	0.221	-0.226
	(0.73)	(0.70)	(13.71)***	(0.52)	(1.22)	(1.03)
Access to a bank (yes)	-0.362	-0.166	-0.200	-2.305	-0.074	1.309
	(1.51)	(0.70)	(0.22)	(2.65)***	(0.16)	(2.04)*
Water storage (1=best, 5=worst)	0.216	-0.122	-0.159	-0.577	-0.277	0.532
	(2.78)***	(1.52)	(0.65)	(2.37)**	(1.06)	(1.52)
Electricity	-0.064	-0.759	1.689	-1.466		
	(0.15)	(1.99)*	(2.14)**	(1.71)*		
Sewage disposal (1=best, 5=worst)			0.434	0.102		
			(2.34)**	(0.45)		
Regional Dummies						
Other Urban-Hill	0.449	-0.116				
	(1.96)*	(0.50)				
Other Urban-Tera	0.037	-0.223				
	(0.12)	(0.73)				
Lima North			0.173	-0.604		
			(0.78)	(2.56)*		

Table 9. (Continued…)

Siera North			0.348	0.335		
			(1.03)	(1.12)		
Siera Central			0.579	0.016		
			(2.06)**	(0.06)		
Siera South			0.506	0.535		
			(1.87)*	(2.26)**		
Selva Alta North			0.027	-0.009		
			(0.09)	(0.03)		
Selva Alta Central			0.396	0.275		
			(0.92)	(0.86)		
Selva Alta South			-0.357	0.215		
			(1.12)	(0.68)		
Selva Baja			-0.299	0.755		
			(1.25)	(3.24)***		
Coastal North			0.335	0.102		
			(1.37)	(0.42)		
Coastal Central			-0.192	0.511		
			(0.66)	(1.92)*		
Coastal South			0.624	0.708		
			(1.74)*	(1.68)*		
Bulawayo					0.052	-0.231
					(0.26)	(0.88)
Mashonaland N					-0.169	-0.504
					(0.65)	(1.45)
Mashonaland E					0.357	-0.929
					(1.69)*	(2.55)**
Mashonaland W					-0.192	0.070
					(0.64)	(0.17)
Matabeleland N					0.056	-1.008
					(0.15)	(1.90)
Matabeleland S					0.141	-0.239
					(0.58)	(0.77)
Midlands					-0.123	-1.112
					(0.30)	(1.97)*
Masvingo					0.187	-0.467
					(0.40)	(0.80)
Constant	1.360	-2.637	2.522	-1.604	6.743	-6.685
	(1.37)	(2.83)***	(1.96)*	(0.88)	(7.99)***	(6.17)***
ρ	-0.766		-0.160		-0.886	
Wald test	$X^2(38)=175.1^{***}$		$X^2(58)=562.9^{***}$		$X^2(48)=345.7^{***}$	
Likelihood ratio test: ρ = 0	$X^2(1)=78.5^{***}$		$X^2(1)=4.89*$		$X^2(1)=228.0^{***}$	
Exogeneity test for nonwage income (F-test)	F-statistic = 8.45 P-value <0.1		F-statistic = 35.77 P-value < 0.001		F-statistic = 19.30 P-value < 0.01	
Test for relevance of instrument (F- test)	F-statistic =21.16 P-value < 0.001		F-statistic = 9.36 P-value < 0.01		F-statistic = 11.59 P-value < 0.01	
Observations	701	701	2170	2170	3218	3218

Absolute value of z statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 10. Child labor supply in rural areas, tobit estimates

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1)	(2)	(3)	(4)	(5)	(6)
	Tobit	IV Tobit		IV		IV
Sex (female)	3.516	3.519	-12.598	-12.598	11.243	11.390
	(3.29)***	(3.30)***	(8.15)***	(8.05)***	(4.70)***	(4.73)***
Age	3.974	3.969	2.812	2.758	14.555	14.537
	(15.6)***	(15.5)***	(8.17)***	(7.90)***	(18.8)***	(18.7)***
Child wage	-0.387	-0.386	4.981	6.138	-5.570	-2.717
	(1.08)	(1.08)	(1.48)	(1.67)*	(0.16)	(0.08)
Man's wage	-0.132	-0.132	-16.506	-17.123	32.395	33.072
	(2.48)**	(2.48)**	(3.28)***	(3.34)***	(1.23)	(1.25)
Woman's wage	0.095	0.095	-3.801	-2.902	-134.026	-130.081
	(1.50)	(1.49)	(1.23)	(0.92)	(3.26)***	(3.12)***
Nonwage income	-6.373		-2.749		-4.576	
	(4.93)***		(2.15)**		(1.93)*	
Nonwage income (predicted)		-5.757		-2.742		-4.905
		(1.65)*		(2.13)		(2.00)
# Young children	0.449	0.472	-1.229	-1.010	1.635	1.823
	(1.00)	(1.02)	(1.68)*	(1.07)	(1.71)*	(1.78)*
Head sex (female)	0.418	0.475	0.616	1.265	-4.137	-4.689
	(0.23)	(0.26)	(0.22)	(0.40)	(1.47)	(1.56)
Head age	-0.784	-0.795	1.366	1.461	1.201	1.114
	(1.77)*	(1.78)*	(1.90)*	(2.02)*	(1.32)	(1.21)
Man's education	-0.762	-0.774	-2.656	-2.260	-2.627	-2.522
	(5.22)***	(4.86)***	(2.30)**	(1.77)*	(3.70)***	(3.42)***
Woman's education	-1.157	-1.170	-1.945	-2.562	-4.797	-4.780
	(4.84)***	(4.70)***	(1.71)*	(1.53)	(6.00)***	(5.97)***
Mother works outside home	3.374	3.404	11.216	12.834	10.861	10.005
	(1.78)*	(1.79)*	(4.61)***	(3.57)***	(1.39)	(1.26)
Community Level Variables						
Educational expenses	-0.486	-0.496	-12.880	-18.221	-59.989	-62.867
	(4.19)***	(3.89)***	(0.90)	(1.06)	(2.61)***	(2.66)***
Access to a bank (yes)	-3.258	-3.297	70.519	73.559	-25.110	-25.694
	(1.97)*	(1.97)*	(3.03)***	(3.00)***	(3.56)***	(3.59)***
Number of school	-0.718	-0.723				
	(3.91)***	(3.91)***				
Water storage (1=best, 5=worst)	2.789	2.772	-3.400	-3.795	3.772	3.672
	(3.43)***	(3.39)***	(1.07)	(1.18)	(1.08)	(1.05)
Electricity	-3.815	-3.833	-29.817	-29.633		
	(2.51)**	(2.52)*	(3.06)***	(3.00)***		
Sewage disposal (1=best, 5=worst)			2.495	2.388		
			(3.78)***	(3.59)***		
Regional Dummies						
Rural West-Hill	5.308	5.318				
	(3.27)***	(3.27)***				
Rural East-Hill	4.976	4.859				
	(2.83)***	(2.61)***				
Rural-West Tera	5.048	5.074				
	(2.61)***	(2.62)***				
Siera North		-1.747	0.641			
		(0.66)	(0.11)			

Table 10. (Continued…)

Siera Central			7.043	6.872		
			(3.14)***	(3.03)***		
Selva Alta North			-6.445	-6.513		
			(1.76)*	(1.77)*		
Selva Alta South			-12.380	-9.376		
			(2.06)**	(1.05)		
Selva Baja			6.390	6.581		
			(2.56)**	(2.62)***		
Coastal North			-8.179	-5.445		
			(2.42)**	(0.91)		
Coastal South			-20.402	-22.800		
			(2.05)**	(2.00)*		
Mashonaland N					6.337	5.981
					(1.35)	(1.26)
Mashonaland E					-1.510	-1.594
					(0.27)	(0.29)
Mashonaland W					-24.118	-24.755
					(4.09)***	(4.11)***
Matabeleland N					8.532	8.566
					(1.41)	(1.42)
Matabeleland S					16.147	16.616
					(3.02)***	(3.06)***
Midlands					-2.893	-3.290
					(0.68)	(0.76)
Masvingo					9.209	9.421
					(2.09)**	(2.13)**
Constant	-51.614	-51.669	-18.781	-20.547	-286.284	-286.162
	(7.74)***	(7.74)***	(1.03)	(1.07)	(12.91)***	(12.90)***
Likelihood ratio test	$X^2(21)$= 545.6***	$X^2(20)$= 527***	$X^2(24)$= 290.8***	$X^2(25)$= 287.9***	$X^2(22)$= 877.0***	$X^2(23)$ = 877.3***
Observations	2876	2876	1395	1387	8654	8654

Absolute value of z statistics in parentheses

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

Table 11. Child labor supply in urban areas, tobit estimates

Explanatory Variables	Nepal		Peru		Zimbabwe	
	(1) Tobit	(2) IV Tobit	(3) Tobit	(4) IV Tobit	(5) Tobit	(6) IV Tobit
Sex (female)	-4.988	-5.068	-14.279	-17.754	30.488	30.960
	(1.01)	(1.03)	(5.03)***	(4.97)***	(1.73)	(1.76)
Age	7.434	7.447	5.733	7.185	22.870	22.913
	(5.49)***	(5.49)***	(8.41)***	(5.42)***	(3.57)***	(3.61)***
Child wage	-0.481	-0.496	4.800	6.891	156.900	153.625
	(0.23)	(0.23)	(2.22)**	(2.66)***	(2.04)**	(2.02)**
Man's wage	-0.194	-0.195	-2.850	-0.703	-79.338	-147.221
	(0.40)	(0.40)	(1.45)	(0.29)	(0.38)	(0.68)
Woman's wage	-0.319	-0.318	1.980	5.832	-133.829	-126.994
	(1.23)	(1.23)	(0.64)	(1.48)	(0.44)	(0.41)
Nonwage income	-0.318		-0.488		-6.134	
	(0.16)		(0.64)		(1.47)	
Nonwage income (predicted)		0.191		-28.672		-45.270
		(0.05)		(1.47)		(1.24)
# Young children	2.887	2.927	0.190	-2.748	8.107	13.002
	(1.09)	(1.10)	(0.12)	(1.05)	(0.94)	(1.31)
Head sex (female)	10.469	10.688	-2.227	-8.731	13.604	38.701
	(1.25)	(1.26)	(0.60)	(1.56)	(0.57)	(1.16)
Head age	-0.036	-0.096	-2.104	2.689	-8.344	-4.546
	(0.02)	(0.04)	(1.55)	(0.79)	(1.09)	(0.55)
Man's education	-1.659	-1.680	-0.937	-1.825	-6.871	-12.434
	(2.69)***	(2.67)***	(0.55)	(0.95)	(1.35)	(1.68)*
Woman's education	-1.966	-2.001	-8.488	-2.509	-12.310	-15.975
	(2.93)***	(2.85)***	(4.76)***	(0.61)	(2.12)**	(2.29)**
Mother works outside home (yes)	10.107	10.234	18.151	12.198	87.491	82.594
	(1.72)*	(1.73)*	(4.86)***	(2.63)***	(2.15)**	(2.05)**
Community Level Variables						
Educational expenses	-0.270	-0.290	-0.060	0.008	76.688	84.990
	(1.09)	(1.06)	(3.11)***	(0.16)	(1.38)	(1.50)
Access to a bank (yes)	-0.387	-0.132	-54.749	-64.245	105.569	99.317
	(0.04)	(0.01)	(1.88)	(2.15)**	(1.25)	(1.18)
Water storage (1=best, 5=worst)	-4.569	-4.587	-12.419	-16.524	35.917	22.850
	(1.56)	(1.57)	(1.47)	(1.93)	(0.69)	(0.43)
Electricity (yes)	-18.572	-18.212	-59.921	-49.806		
	(1.41)	(1.37)	(2.16)**	(1.67)		
Sewage disposal (1=best, 5=worst)			-6.298	0.384		
			(0.96)	(0.05)		
Regional Dummies						
Other Urban-Hill	-2.909	-3.153				
	(0.36)	(0.39)				
Other Urban-Tera	-5.871	-6.057				
	(0.55)	(0.57)				
Lima North			-15.098	-22.016		
			(2.02)**	(2.67)***		
Siera North			14.326	8.409		
			(1.39)	(0.80)		

Table 11. (Continued…)

Siera Central			7.420	-1.233		
			(0.86)	(0.13)		
Siera South			14.300	13.025		
			(1.71)*	(1.57)		
Selva Alta North			6.827	-0.009		
			(0.65)	(0.00)		
Selva Alta Central			9.879	8.776		
			(0.87)	(0.79)		
Selva Alta South			12.885	7.701		
			(1.19)	(0.70)		
Selva Baja			20.910	21.734		
			(2.59)***	(2.66)***		
Coastal North			7.517	3.073		
			(0.92)	(0.37)		
Coastal Central			21.079	15.260		
			(2.38)**	(1.65)*		
Coastal South			4.507	16.100		
			(0.38)	(1.08)		
Bulawayo					2.983	-7.281
					(0.07)	(0.18)
Mashonaland N					30.468	11.931
					(0.64)	(0.24)
Mashonaland E					-12.518	-18.835
					(0.33)	(0.48)
Mashonaland W					-89.900	-90.869
					(1.06)	(1.06)
Matabeleland N					-47.859	-62.251
					(0.92)	(1.16)
Matabeleland S					42.767	11.443
					(1.04)	(0.23)
Midlands					-36.927	-52.831
					(0.64)	(0.89)
Masvingo					-113.551	-137.787
					(1.63)	(1.86)*
Constant	-83.446	-84.227	-14.304	0.902	-654.146	-682.860
	(2.46)*	(2.42)*	(0.32)	(0.02)	(3.38)***	(3.46)***
Likelihood ratio test	$X^2(18)$= 115.8***	$X^2(19)$= 115.4***	$X^2(28)$= 263.3***	$X^2(29)$= 261.2***	$X^2(23)$= 67.2***	$X^2(24)$= 74.1***
Observations	692	692	2203	2170	3218	3218

Absolute value of z statistics in parentheses

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