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The Effect of Child Work on Schooling: Evidence from Egypt

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Abstract

The negative correlation between children's work and schooling is well-documented. However, the causal link between child labor and school attainment has not been well established in the literature. We show that work, broadly defined, substantially reduces schooling for both boys and girls. We present evidence that lower rates of school attendance for Egyptian girls are caused by a substantial burden of household work. While market work is a serious impediment to schooling for boys, a much larger proportion of girls than boys engage in substantial hours of work, when work is defined to include both labor force and domestic work.

JEL Classification: D15, I21, J82, N35

Keywords: child labor, schooling, household economics, gender differences, Egypt

I. Introduction

Human capital enhancement is an essential element of poverty reduction, therefore children's participation in primary and secondary schools plays an important role in the development of societal infrastructure in poor countries. There is a strong negative correlation between children's work responsibilities and educational attainment, and this has led development experts and child advocates to call for the elimination of child labor. Unfortunately the *causal* link between work and schooling is not well-documented. It could very well be that for reasons associated with schooling quality or accessibility, children fail in school, which leads parents to put them to work. Eliminating child labor without improving school quality would do little to improving educational attainment in this situation. This paper includes causal evidence that lower crude rates of school attendance for Egyptian children are not due to limited access to schools but rather to a substantial burden of work.

According to recent survey data there have been significant improvements in the school enrollment rates of Egyptian children and substantial reductions in child labor in the 1990s (Assaad 2002, Zibani 2002). From 1988 to 1998, school enrollment of 6-14 year olds jumped from 82 to 89 percent, while their involvement in market and subsistence labor force activities fell from 11.4 to 6.2 percent.[2] Still, in 1998 approximately 1.4 million children ages 6-14 (11%) did not attend school, and approximately 800 thousand children regularly engaged in labor force work, while 2.2 million girls (37.7%) spent time on household chores and uncounted hours

[2] These figures are obtained from the Labor Force Sample Survey of 1988 and the Egypt Labor Market Survey of 1998, which are further described below. The labor force participation rates reported here are based on the extended definition of economic activity and a short reference period of one week with a one-hour per week minimum threshold.

engaged in child care (Zibani, 2002). Similar increases in enrollment and reductions in labor force work were observed for adolescents between the ages of 15 and 17 during that period. Their enrollment rates increased from 60 to 69 percent and their labor force participation rates fell from 32 to 24 percent.

Although some activists argue that all child labor should be abolished, we prefer a more nuanced approach which does not assume that all work – whether it is paid or unpaid, labor force or domestic – is good or bad for children and youth. We use the terms "child work" and "child labor" interchangeably; in our usage, neither has a pejorative sense, per se. While some work activities of children are unquestionably detrimental to their physical and/or mental well-being, most tasks undertaken by Egyptian 6-14 year olds do not fall clearly in these categories. The majority of children work in their own family's enterprises or in domestic activities. Moreover, many children work for only a few hours per week, which is unlikely to put their schooling at risk. On the other hand, the conventional measures of labor force work often ignore a variety of child activities that could potentially jeopardize their schooling. This is especially true for girls who must often do domestic chores, which are not captured in the conventional definitions of work, for many hours each day. When meal production and/or child care are required, the times at which chores take place may be less flexible than often assumed. We start from the position that all children should have the opportunity to attend school, thus potentially reaping the benefits of increased human capital formation throughout the rest of their lives.[3] Increasing

[3] This assumption also has its problems. When schools are of poor quality, children may benefit more from other activities. When children are regularly beaten and verbally abused in schools, our assumption is again problematic.

enrollment and education attainment levels is also desirable as a mechanism for reducing fertility and population growth (1.7% in Egypt in 2000-2005). Thus, the essential question we seek to explore is the following: when does children's work, broadly defined, put Egyptian children at risk of not benefiting from education to the extent possible?

The population of greatest interest to us includes those young people who are expected to be in school, according to Egyptian law, and who are defined as children under most international conventions: girls and boys ages 6 to 14 years old. Thus, the bulk of our discussion focusses on this age group. Our analysis, however, also includes 15 to 17 year old youth to test whether the relationship between work and schooling changes fundamentally after the completion of basic schooling, the point at which work becomes legal and further schooling optional in Egypt.

Disentangling causal relationships. Higher school enrollment and improved school attainment has been repeatedly shown to be one of the most effective ways to reduce both poverty and fertility. The benefits of schooling accrue not only to the individual him or herself but to the entire society through a variety of spillover effects. There is less consensus on the harmful effects of child labor. Some argue that if children learn important skills and discipline by working, the early onset of work could be beneficial if it does not unduly affect schooling. On the other hand, if child work interferes with schooling or exposes children to harmful and hazardous conditions, it clearly has detrimental effects. Because child labor is strongly associated with not being in school, it is often assumed that child labor causes school dropout. This is not necessarily true, however. It could very well be that for other reasons, some children are at risk of failing at school, and they engage in work because their schooling prospects are poor. Disentangling the direction of causality is crucial to implementing the right policies. If

work causes school dropout, then policies to curtail child labor are justified. However, if failure in school results in child work, then policy measures need to focus on addressing the reasons for school failure as a first priority.

An enormous literature speaks to the enrollment and educational attainment of children in developing countries, and a more recent and growing literature addresses child labor force work. A number of studies from the last decade explicitly recognize the necessity of considering schooling in conjunction with children's labor force employment and non-labor-force work responsibilities.[4] This comprehensive type of approach is needed to attain an adequate understanding of how to facilitate the educational success of children with multiple responsibilities.

Few analyses, however, have taken account of the simultaneous nature of family (or child) decisions regarding school and work activities due to various estimation difficulties. Some authors use a multinomial logit approach to jointly consider categories: work, work and school, school only, or neither.[5] One of the problems of this approach is the assumption of independence

[4] Examples include DeGraff and Bilsborrow (2003) for the Philippines; Jensen and Nielsen (1997) for Zambia; Canagarajah and Coulombe (1998) for Ghana; Knaul (1995, 1999) for Mexico and Colombia; Levison (1991) for Brazil; Patrinos and Psacharopoulos (1997) for Peru; Psacharopoulos (1997) for Bolivia and Venezuela; Psacharopoulos and Arriagada (1989) for Brazil; Ridao-Cano (2001) for Bangladesh; and Skoufias (1994) for India.

[5] Examples include Levison, Moe and Knaul (2001) and various chapters in Grootaert and Patrinos (1999).

of irrelevant alternatives. Others have used ordered probit models.[6] The fundamental problem with such models is that they must assume the parents and children always rank order activities in a certain way. For example, analysts assume that school only is preferred to combining school and work, which is preferred to work only. We find this assumption inappropriate, not least because of the lack of empirical evidence to validate its use. Others have used a bivariate probit approach that models work and school enrollment as two interdependent binary decisions (Canagarajah and Coulombe 1998; Wahba 2000). All of the above approaches suffer from the problem of not being able to disentangle the causal effects of child work on school enrollment. We use a modified bivariate probit approach that allows for the estimation of the effect of work on schooling, while allowing for the simultaneous determination of the two outcomes. To be implemented successfully, the approach requires the availability of instruments that determine the probability of working but do not directly affect the schooling decision.[7]

Domestic work. Girls' domestic labor, dimissively called "chores," is also regularly ignored in analyses of children's activities. In particular, the potential for housework and child care responsibilities to interfere with educational attainment has been overlooked. Levison and Moe (1998) and Levison, Moe and Knaul (2001) document that an assessment of whether or not to work impedes educational attainment is sensitive to how one defines work, especially for girls. They also show that a traditional definition of work misrepresents the gender differentials in the

[6] Authors of various chapters in Grootaert and Patrinos (1999) employ a shared estimation strategy, including ordered probit models of children's work and school participation.

[7] Ridao-Cano (2001) and Ridao-Cano and Canals-Cerda (2003) use a similar approach to determine the effect of working while in school on the probability of progressing to secondary school in rural Bangladesh.

incidence and determinants of work among children in Peru and Mexico. Although a distinction between market work and domestic work is useful, the traditional definition of market work makes some seemingly arbitrary distinctions between activities that are essentially similar. Performing unpaid work in a family enterprise and preparing food in a market stall are considered work, whereas similar activities done for purposes of household consumption are not. While such distinctions may make sense in the context of national accounts or labor force statistics, they may result in biases when trying to understand the phenomena of child labor and schooling (Levison 2000). Our data includes information on women's and girls' domestic activities, including the three most important activities carried out in the reference week, by order of importance, as well as the total amount of time spent on all domestic activities. Initially, these questions were addressed to men and boys as well, but responses during the pre-test phase of the questionnaire convinced the survey designers to drop these questions for males.

Measuring wealth. Many studies have explicitly examined the causal relationship between the socioeconomic status of household and child labor and schooling, but the great majority are limited by data sets with few measures of wealth. Wahba (2000) explores the transmission of child labor across generations by testing whether the probability that a child will work is affected by whether his or her parents were child workers. Lloyd et al. (2001) examine the effect of household wealth, as measured by an asset index, on educational attainment among adolescents. We use a similar asset index, constructed separately for rural and urban areas, to determine how the position of the child's household in the distribution of wealth determines the child's work and school enrollment status.[8]

[8] The construction of the wealth index is described in an appendix.

Objectives. This paper has three main objectives. First, it attempts the difficult task of determining the causal relationship between child work and school participation in Egypt. Second, it explands the definition of work for girls to include unpaid domestic work done in the girls' own homes. Girls' involvement in domestic work is extensive and undocumented in standard labor force statistics. Third, it attempts to relate children's vulnerability to work and lack of schooling to the characteristics of their parents and their households.

Admittedly, child work could have implications for schooling beyond determining current school attendance. It could affect the regularity of school attendance as well as school performance and grade advancement. Ultimately, any negative effects are bound to increase school dropout and thus affect enrollment. Given the limitations of our data sources we are unable to consider these other dimensions of schooling.

The paper is structured as follows. The next section describes the data on which this analysis is based. Section III provides a context in which to understand the results of the multivariate analysis. Here we present descriptive statistics related to Egyptian children's school and work experiences.[9] A framework for the analysis, variables used, and estimation methods are described in section IV on methodology. Estimation results follow in section V. Detailed discussions of variables used and our hypotheses concerning them are combined with the discussion of estimation results, to reduce redundancies. The conclusion (section VI) includes policy recommendations.

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[9] A longer, more detailed version of sections II and III is available in a working paper. See R. Assaad, D. Levison, and N. Zibani (2001). "The Effect of Child Work on School Enrollment in Egypt." Working Paper #0111, Economic Research Forum for the Arab Countries, Iran and Turkey (ERF), Cairo, Egypt.

II. Data

The data for this study are obtained from the Egypt Labor Market Survey (ELMS-1998), which is a nationally-representative household survey carried out on a sample of 5,000 households in late 1998. Ragui Assaad was principal investigator, responsible for the sampling design, instrument, training of enumerators, and fielding of the survey. The survey was conducted under the auspices of the Economic Research Forum for the Arab Countries, Iran and Turkey, in collaboration with the Central Agency for Public Mobilization and Statistics (CAPMAS), the Government of Egypt's central statistical agency. The ELMS-1998 was designed to be comparable to a special round of the Egyptian Labor Force Sample Survey conducted exactly 10 years earlier in October 1988 (LFSS 1988), but the 1998 survey included significantly more information on a variety of topics including schooling and domestic work for women and girls. The ELMS-1998 survey instrument comprised a household questionnaire, an individual questionnaire, and a family enterprises questionnaire. The household questionnaire was administered to the head of household or his/her spouse for each household, and an individual questionnaire was administered to each member of the household aged 6 and above. The individual questionnaire included modules on parents' characteristics, education, work status in a reference week and reference three months, unemployment, characteristics of employment, detailed work histories, and earnings from work for wage workers. If any of the members of the household reported being self-employed or an employer, the household also answered a family enterprises questionnaire.

Completed questionnaires were obtained for 4,816 households and 23,997 individuals, of whom 5,003 were children between the ages of 6 and 14 and another 1,801 were adolescents aged 15 to 17. Due to missing data on some variables, our final sample includes 4,963 children ages 6-14 (2,530 boys and 2,442 girls), and 1,790 adolescents (925 boys and 865 girls).

We make passing use of the LFSS 1988 for the purpose of assessing changes over time in children's activities. The LFSS 1988 sample of 10,000 households is also nationally representative.

III. Work and School in the Egyptian Context

Basic education. There are currently nine years of mandatory basic education in Egypt, made up of six years of primary education and three years of lower secondary education. For a period of nine years, from 1990 to 1999, the years of primary education were reduced to 5 years to allow for the absorption of a larger number of children in the school system.[10] Since all of the children in our sample would have been below the fifth grade in 1990, they would have been required to take only 5 years of primary schooling and three years of lower secondary schooling. Despite the fact that basic schooling up to and including the lower secondary stage has been mandatory in Egypt since 1991, the law is not strictly enforced and school dropout before the mandated requirement is not uncommon.[11] Children typically enter the education system at age 6. They are generally not allowed to enter before age 6, and some start late at age 7 or 8. By age 14, they should be in their last year of basic education. Thus, all the 6-14 year olds in our sample should be enrolled. Still, we find that 11 percent of children in that age group are out of school, and 7.2 percent of the sampled 14-year-olds in 1998 have never attended school and probably never will.

[10] The sixth year was phased back in starting with the children who entered the first grade in 2000.

[11] Prior to 1991, mandatory basic education was limited to the primary stage. No child in our sample would have been subject to the reduced requirement.

According to the ELMS-1998, most enrolled 6-14 year olds attend public schools (89.6% in 1998), with the remainder split between private schools (7.6%) and religious schools (2.8%). On average, 6-14 year olds spend 5.9 hours per day in school. Many schools work in shifts: 46 percent of children are in schools with more than one shift, with shifts typically being held in the morning and afternoon. In a school with a given number of shifts, school hours are not flexbile, so that school attendance is essentially a zero-one variable.

Enrollment increased significantly between 1988 and 1998 in part due to a massive school-building campaign in rural areas. From a comparison of the LFSS-1988 and the ELMS-1998, we see that rural girls – the group with the lowest enrollment rates – benefited disproportionately. In 1988, 62 percent of rural girls ages 6 to 14 were enrolled, and by 1998 this proportion had risen to 81 percent. Rural boys' enrollment increased from 87 to 91 percent. Urban children had significant increases in enrollment as well, albeit from higher initial levels. Urban girls' enrollment rates went from 89 to 93 percent and boys from 92 to 95 percent.

Upper secondary education. At the end of the last year of basic education, students must pass a government-mandated exam. Their grade in this exam determines whether or not they can continue schooling and in what type of upper secondary schooling they will be permitted to enroll. Those who exceed the upper cutoff can go on to the university-bound general secondary track. Those who exceed the lower cutoff but fall short of the upper cutoff are directed to the terminal vocational secondary track, which is itself subdivided into several sub-tracks. Both tracks are three-years long. Those who fall short of the lower cutoff must discontinue their schooling at that point. Of individuals under 35 years of age in the ELMS-1998 who are no longer in school but who have completed their basic schooling, 8 percent left school

altogether, 33 percent went on to general upper secondary school, and 56 percent went to vocational secondary school.

As in the case of 6-14 year olds, enrollment rates among 15-17 year olds increased the most between 1988 and 1998 where they were lowest to start with, thus narrowing the enrollment gap between urban and rural areas and between boys and girls. For rural girls ages 15-17, enrollments increased from 35 percent in 1988 to 57 percent in 1998, followed by rural boys, whose enrollments went from 59 to 68 percent. Urban children in this age group also saw increases in enrollment during the decade, from 71 to 78 percent for girls and from 74 to 80 percent for boys.

Work. Until 1996, children were allowed to begin working outside the home at age 12 under certain conditions. The minimum age of work was increased to 15 in 1996 to bring it into line with the age of mandatory schooling. Despite these laws, a significant proportion of children continue to work. The interviewers conducting the survey were carefully trained to inquire about children's work with a great deal of sensitivity. Instead of simply asking whether an individual was working, a series of screening questions about specific activities, such as participating in family projects or learning a trade in a workshop, were asked. Although the survey instructions generally required that the individual him- or herself respond to the questions in the individual questionnaires, an exception was made for children under 15, on whose behalf an adult member of the household could respond. This exception was made to ensure that the respondents understood their right for informed consent. Parents opted to respond on behalf of their children in 80 percent of the cases and allowed children to respond for themselves in 20 percent of the cases. When the proportion of children 6 to 14 reported to be working is tabulated against a variable indicating whether there was a proxy respondent, we find that there

is no significant difference in activity rates by type of respondent for either boys or girls when we use the market definition of work (see below). This suggests that proxy respondents were not systematically underreporting child work. The only time we find a significant difference in prevalence of child work is when we use the inclusive definition of work for girls, which includes domestic work. Parents' underreporting of girls' domestic work is clearly not due to any sensitivity about children's work, but can be attributed instead to different perceptions between parents and children about what constitutes domestic work. Given that there is a great deal of controversy over which of the activities that children engage in constitute work, we lay out alternative definitions of work that attempt to avoid significant gender bias in the way work is defined.

Inclusive work. In the broader definition of work that we use, which we refer to as "inclusive," we include three categories of activities. Labor market work and subsistence work are counted as work, as are domestic chores performed by women and girls at home. Although the latter are not considered employment according to international definitions of economic activity (ILO 2000), they can interfere with a child's school attendance and performance. Labor market work includes productive activities for the purpose of market exchange. Subsistence work includes activities involving the production and processing of primary goods for purposes of household consumption, such as feeding and caring for livestock and poultry, or making butter or cheese. Domestic work includes cooking, errands, house cleaning, collecting water, laundry, and childcare. We suspect, however, that some chores, such as childcare, are underreported. In the most comprehensive study to date of measuring child work, Reynolds (1991) illustrates the difficulties of capturing these kinds of tasks. Indeed, as shown above, the greatest discrepancy in reporting child work between children themselves and their parents had to do with domestic

work. In our data the inclusive definition of work is only applicable for girls, since the ELMS-1998 did not address the household chores question to male members of the household.

Market work. The narrower definition, which we call "market," restricts the definition of work to labor market work only. Market work includes substantially fewer 6-14 year-old girls than does inclusive work – only 106 thousand (1.7 percent), compared to 2.7 million (42.8%) doing market plus subsistence plus domestic work (i.e. inclusive).[12] In contrast, 300 thousand 6-14 year-old boys (4.6 percent) in Egypt are engaged in market work. In our subsequent analysis, we use the market definition for boys and the inclusive definition for girls.

Hours worked cut-off. A further issue in the detection of work among children is the number of hours per week that such work is undertaken. The international recommendations are to consider an individual who is engaged in an economic activity for at least 1 hour per week as employed. Since our interest is in detecting the kind of work that can potentially interfere with a child's schooling, we use a higher hours cut-off of 14 hours per week to identify a working child.[13] A girl is considered working according to the inclusive definition if she participates in either domestic, subsistence, or market work for 14 or more hours per week for all the activities combined.[14] A boy is considered working if he engages in 14 or more hours per week of market work.

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[12] These figures are based on a one-week reference period with a one-hour minimum threshold.

[13] We experimented with a series of cutoffs from 8 hours to 14 hours per week and found that the proportion of working children ages 6-14 was fairly robust to changes of the cutoff value in that range.

[14] Because of the way the questionnaire is designed, we do not observe the number of hours in subsistence work for girls who are engaged in market work; thus, our inclusive measure will

Reference period. Finally, there is the issue of reference period. Labor statistics are collected for two reference periods: a short reference period of one week and a long reference period of 3 months or one year (3 months in the ELMS 1998). In light of Levison et al's (2002) findings that short reference periods can result in intermittent child workers being mis-identified as being out of the labor force, we opted to use the more inclusive long reference period even though it may include some summer work. This 3-month reference period includes the months of August, September and October, 1998. It turns out that the change in reference period makes very little difference for girls ages 6-14, although it makes some difference for boys of that age. It appears that girls who work, work all year round, whereas some boys appear to only work during the school vacations. Similar results hold for boys and girls between the ages of 15 and 17.

Interrelated Patterns of Work and School. Table 1 provides the means and standards deviations for our dependent variables by sex and age group, weighted by the appropriate sampling weights, while Figure 1 shows how school and work patterns change with age. First, we note that substantially more girls than boys are out of school – a difference of about seven percentage points.[15] In contrast, more than twice as many boys as girls are engaged in market

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understate the total hours of work for the small number of girls engaged in both market work and subsistence work.

[15] The slight dip in school attendance at age 10 is most likely due to age heaping. Lack of precision about age (and, thus, heaping on 10) is more likely for those children who do *not* go to school because parents of children who are out of school are likely to be illiterate and therefore not sure of the ages of their children.

work at ages 6-14, and the differential increases at older ages. Once subsistence and domestic activities are included, however, girls' activity rates rise greatly.

The first panel of Table 1 shows that the change of cutoff from 1 hour to 14 hours per week makes little difference for the measurement of activity rates in market work for either boys or girls, indicating that participation in such work is generally a time-intensive activity. However, it does make a difference for girls in the measurement of inclusive work.

Since our primary concern is to study how schooling and work interact, the second panel of Table 1 presents the cross-classification of the schooling and work variables for the various definitions of work with the 14-hour per week cutoff used throughout the rest of this paper. A substantial proportion of the 6-14 year-old boys who work (36%) combine work and school. In contrast, very few girls who engage in market work manage to combine work with school. Domestic work, on the other hand, appears to be compatible with schooling for girls. According to the market work definition, about 13 percent of girls ages 6-14 are neither in school nor working. When the inclusive definition of work is used, however, this group falls to 3.5 percent, relatively close to what it is for boys. Thus the persistently higher proportion of girls who are typically reported to be neither in school nor at work (often interpreted as the proportion "idle") hinges crucially on how work is defined for girls.

Weekly hours worked are high on average – between 44.2 and 52.8 hours – for boys and girls 6-14 engaged in market work, regardless of whether our 14 hour cut-off is applied. Applying the cut-off eliminates a number of low-hours girls doing subsistence and household work from our sample. Including those girls yields 19.4 mean weekly hours of inclusive work, while excluding them raises the mean to 25.5 weekly hours. Although children 6-14 who combine work and school work fewer hours than children who do not, they still work a

significant number of hours. Boys who combine work and school do an average of 25 hours of market work per week, whereas girls who do so work nearly 16 hours according to the inclusive definition of work.

As children become adolescents, they take on more adult roles and responsibilities, which are reflected in their activities. School attendance decreases and is replaced by substantial increases in proportions engaged in market work (for boys) and domestic work (for girls); the proportions doing both rise as well. Conditional on working, however, average hours for 15-17 year olds are not necessarily higher than for younger workers.

Overall, the most striking feature of Table 1 is the extent to which official definitions of work understate the work of girls. When work is broadly defined to include domestic work, nearly one-third of girls ages 6-14 and over two-thirds of girls ages 15-17 work for at least 14 hours per week. There is a shift upward in girls' workload between ages 11-13, simultaneously with a decline in school attendance; this may correspond with the greater restrictions on mobility placed on girls at puberty (Mensch et al., 2003). Girls' workload increases again at 15-16. This is likely explained by evidence collected by Mensch et al (2000), who document that about half of 10-12 year old boys participate in domestic chores, but only about 20 percent of 16-19 year olds. They write:

> The activity profile that emerges by late adolescence reflects the expected patterns for Middle Eastern societies: boys have considerably more free time than girls, and they tend to spend that time outside the home, with friends, engaged in sports, or visiting friends' homes. Work roles become gradually segregated, with boys more likely to participate in paid labor while girls participate in domestic work within the household (page 14).

Boys appear to anticipate their exit from school by increasing their work activities: market work rises substantially between ages 13 and 14, followed by a large decline in school attendance between ages 14 and 15.

IV. Methodology

Framework. We use a standard household production model as the framework for this analysis (Becker 1965). Although this framework has repeatedly been found lacking due to its inability to incorporate the effects of power and control over resources on the intra-household allocation of time and resources, alternative frameworks are even more limited. Moreover, we have no information on control over resources that would allow us to consider bargaining among family members; most of our data is at the household level. Our econometric model estimates the effect of work on school enrollment, while allowing for endogenous work status. Our model also allows for self-selection into work and accounts for such selection in the schooling equation, but self-selection is not empirically supported in our sample.

Variables. The two binary dependent variables are described in detail above. In brief, one of the dependent variables indicates whether or not the child is in school at the time of the survey. (Our schooling variable is based on a question about whether or not the child is currently in school, which was interpreted as whether or not the child was attending school, and not merely enrolled.) The other dependent variable indicates whether or not the child is engaged in work for at least 14 hours per week in the three-month reference period. We did not attempt to perform the multivariate analysis for a definition that restricts work to only market work for girls, because too few girls in our sample are engaged in such work.

Descriptive statistics for the explanatory variables are presented in Table 2. Detailed discussions of explanatory variables and our hypotheses concerning them are conducted in the results section to reduce repetition. Broad categories of independent variables include characteristics of the child such as age and relationship to the head of the household, characteristics of the child's father and mother, including whether or not they are present in the

household, their ages and their education and, in some versions of the model, the main employment status of the father. The wealth distribution is proxied by urban and rural asset scores constructed using factor analysis; this is described in an appendix, and the specification of the wealth variables is described below. Explanatory variables also include residence in urban and rural areas, by region of Egypt, and the proportion of the male and female population in the locality with secondary education or above. Mindful of the fact that household composition is sometimes considered endogenous to other household decisions, we included household composition variables only in a final model to assess the impact of their exclusion on other variables. The household composition variables count the number of household members in various age/sex groups.

Estimation. Our full-information maximum-likelihood estimation approach relies on a model of binary choice with binary endogenous regressors. In discussing the class of limited dependent variable models with dummy endogenous regressors, Angrist (2001) argues that the difficulty with such models is their focus on estimating structural parameters such as index coefficients. If, on the other hand, the focus of estimation is the causal effect of a treatment on an outcome variable (in our case the effect of child work on schooling), much of the difficulty disappears, so long as the identification problem can be overcome. The general framework for examining the effect of endogenous treatments on discrete outcomes is laid out in Aakvik et al. (2004). They develop a model to study the impact of interventions on discrete outcomes when responses to treatment vary among observationally identical individuals. The model offers a way to control for selection in determining the effect of the treatment and to estimate an average treatment effect, as well as an effect of the treatment on the treated. The model potentially allows the effect of observables *and* unobservables on the outcome to differ for the treated and

untreated sub-samples. In our case, the "treatment" is child work and the "outcome" is school attendance. A similar model is applied to the effect of working while in school on school progress in a paper on Bangladesh by Ridao-Cano (2001). Ridao-Cano estimates a switching probit model, where a separate schooling equation is estimated for working and non-working children. The switching probit model was also applied in a study of the effect of fertility on women's labor force participation in the U.S. by Carrasco (2001).

In comparison to the switching probit approach, a bivariate probit approach where the treatment variable is entered separately or interacted with each of the exogenous regressors restricts the effects of unobservables to be the same for the "treated" (working) and "untreated" (non-working) samples. In other words, a bivariate probit approach neglects the effect of self-selection on the effect of the treatment on the outcome by restricting the correlation coefficients of the disturbances of the work and schooling equations in the treated and untreated regimes to be equal. We attempt to test for the presence of selection using a switching probit approach by testing for the equality of these correlation coefficients. Because of convergence problems in the unestricted model, our tests are inconclusive. We therefore end up estimating a bivariate probit model with an endogenous binary regressor.

The Model. For each child i, assume there are two binary outcomes: schooling ($S_i = 1$, if the child is in school, and $S_i = 0$, if not), and work ($W_i = 1$, if the child works, and $W_i = 0$, if not). The observed binary outcomes are generated according to underlying latent index structure as follows:

$$W_i = \mathbf{1}(W_i^* \geq 0) = \mathbf{1}(Z_i\beta_w + \varepsilon_{wi} \geq 0)$$
$$S_i = \mathbf{1}(S_i^* \geq 0) = \mathbf{1}(W_i\alpha + X_i\beta_s + \varepsilon_{si} \geq 0)$$

where W_i^* and S_i^* are latent variables indicating the difference in the household's utility between putting and not putting the child to work and sending and not sending the child to school, respectively, and **1** denotes the indicator function. Z_i and X_i are vectors of exogenous regressors, with at least one regressor in Zi that is not in X_i for purposes of identification.[16] $(\varepsilon_{wi}, \varepsilon_{si})$ are random disturbance terms that are assumed to be jointly normally distributed, with zero means and a covariance matrix $\Sigma = \begin{pmatrix} 1 & \rho \\ & 1 \end{pmatrix}$.

Consistent estimates of the parameters $\alpha, \beta_w, \beta_s, \rho$, are obtained using full-information maximum likelihood methods. The log-likelihood function is given by:

$$L = \sum_{W=1,S=1} \log P_{11} + \sum_{W=1,S=0} \log P_{10} + \sum_{W=0,S=1} \log P_{01} + \sum_{W=0,S=0} \log P_{00}$$

$$P_{11} = \Pr[W = 1, S = 1] = \Phi_2\left(Z\beta_w, (\alpha + X\beta_s), \rho\right)$$
$$P_{10} = \Pr[W = 1, S = 0] = \Phi_2\left(Z\beta_w, -(\alpha + X\beta_s), -\rho\right)$$
$$P_{01} = \Pr[W = 0, S = 1] = \Phi_2\left(-Z\beta_w, X\beta_s, -\rho\right)$$
$$P_{00} = \Pr[W = 0, S = 0] = \Phi_2\left(-Z\beta_w, -X\beta_s, \rho\right)$$

where Φ_2 is the bivariate normal distribution function. The individual subscripts i are suppressed for clarity.

Identification Strategy. To identify the structural schooling equation we need instruments that can be excluded from the schooling equation but that have some explanatory

[16] A switching probit approach would include two separate schooling equations, with different regressors and error terms, one for children who are observed working and one for those who are not. Potentially, we could have also interacted W_i and X_i in the schooling equation, allowing the effects of observables on schooling to be different for working and non-working children, but we refrained from doing so due to the smallness of our working children sample.

power in the work equation. Since we are examining both market work and household work, our instruments need to proxy for the demand for such work and be exogenous to household decisions on child work and schooling. To proxy for demand for market work, we use instruments that indicate the prevalence in the local community (village or neighborhood) of the occupations in which children are most often found. We conjecture here that most children work close to home, so that it is local labor market conditions that will determine the demand for their labor. Given the structure of labor markets for educated workers in Egypt, we suggest that decisions on schooling are made on the basis of returns to schooling in a much broader regional or national labor market and will thus not be affected by local labor market conditions. We confirm this using the appropriate overidentification tests. The instuments we use are the percentage, among the working age population of the locality, of workers in service and trade occupations, in agriculture, and in craft occupations. These percentages are obtained from the 1996 population census for the village or neighborhood in which the child lives.

To proxy for the demand for domestic labor, we use the household's access to basic public services: piped water, piped sewage disposal, and garbage collection. The absence of such services is expected to substantially increase the domestic burden of women and girls without directly affecting the decision to send a child to school, once the wealth of the household has been controlled for. We maintain that variables indicating access to urban services in Egypt are for the most part exogenous to household decisions since they are essentially a function of where the household resides rather than the result of a separate decisionmaking process about whether or not to purchase the service in question. Given the rigidity of the housing market in Egypt, and the resulting relative immobility of households, decisions about where to reside are at

the very least pre-determined if not completely exogenous.[17] We acknowledge that if the quality of local services is correlated across types of services, the absence of urban services could be associated with lower quality schools, thus indirectly affecting schooling decisions. We attempt to address this issue by including controls for the availability of local schools such as whether the child can walk to a school of the appropriate level and how long it takes to walk to the school. We also include variables that indicate the percentage of men and women in the locality who have completed secondary school. We test this exclusion restriction with the appropriate overidentification tests, as described below. The descriptive statistics for the instrumental variables for all four work/school states are shown in Table 2.

To evaluate the effectiveness of our instruments, we conduct two sorts of tests. First we do a joint test of significance for the six instrumental variables. The tests indicate that the instruments are jointly significant for both boys and girls.[18] It is reassuring that the proxies for demand for market work are the ones that have power for boys and that the proxies for demand for domestic work are the ones that have power for girls. The second test is an overidentification

[17] According to the ELMS 1998, only 6.3 percent of adults who ever worked changed their place of residence in the ten years previous to the survey.

[18] We obtain the following test statistics for a Wald test of joint significance: For boys, Model 1 had $\chi^2(6) = 27.96$, p-value= 0.0001; Model 2 had $\chi^2(6) = 20.80$, p-value= 0.002; and Model 3 had $\chi^2(6) = 19.37$, p-value= 0.0036. For girls, Model 1 had $\chi^2(6) = 42.27$, p-value= 0.000; Model 2 had $\chi^2(6) = 38.93$, p-value= 0.0000; and Model 3 had $\chi^2(6) = 34.31$, p-value= 0.000. Similar results were obtained for joint tests of the instruments including their interactions with the age 15-17 dummy variable.

test that confirms that the instruments can be excluded from the schooling equation. We should note that the test is conditional on the validity of at least one of the six instruments. The test consists of running a model in which all the instruments are introduced in both the work and schooling equations, relying on the non-linear functional form for to obtain estimates. We then carry out a likelihood ratio test of this unrestricted version of the model against the restricted version, where the instruments are excluded from the schooling equation. A statistically insignificant test statistic indicates that the instruments can be safely excluded from the schooling equation. Our instruments passed the over-identification test in all the specifications we estimated for boys' market work and girls' inclusive work, although the evidence in favor of the exclusion restrictions in the boys' model is more compelling.[19]

Other specification issues. As stated earlier, we are primarily interested in the effect of work on schooling for children under 15 years of age, but we are also curious about how this effect and those of other determinants of schooling may differ for older children – those in the 15 to 17 age group. To get separate estimates of the effects for the two age groups and to be able to conduct statistical tests for differences in the effects across them, we specify a full-interaction model in which the explanatory variables – including the endogenous "work" variable but

[19] For this test, there are 12 degrees of freedom because each of the 6 instruments is interacted with the dummy variable indicating age 15-17, resulting in 12 restrictions. We obtain the following test statistics: For boys, Model 1 had $\chi^2(12) = 4.66$, p-value= 0.9683; Model 2 had $\chi^2(12) = 3.47$, p-value= 0.9913; and Model 3 had $\chi^2(12) = 3.76$, p-value= 0.9874. For girls, Model 1 had $\chi^2(12) = 18.23$, p-value= 0.1089; Model 2 had $\chi^2(12) = 17.73$, p-value= 0.1242; and Model 3 had $\chi^2(12) = 17.52$, p-value= 0.1312.

excluding age and age squared -- are interacted with a dummy variable indicating that a child is between the ages of 15 and 17. The dummy is also entered separately, to allow the probability of work and schooling to shift at age 15, the legal age of work in Egypt. The main effect for each variable, reported in a first column of Tables 3A and 3B, is the effect for children 6 to 14, and the interaction term coefficient, shown in a second column, is the incremental effect of the variable for children 15 to 17. The coefficient of the age 15-17 dummy itself is shown in the row labelled "constant." Although a few of the interaction terms are statistically significant, a joint test of the 15-17 dummy and all the interaction terms in both the schooling and work equations reveals that they are jointly insignificant, suggesting that there is little evidence of systematic differences in the determinants of work and schooling for the two age groups.[20]

To capture the effect of wealth on child labor and schooling we construct a composite variable based on the ownership by the household of a list of 23 durable goods and on a series of housing characteristics, such as type of floor and ceiling and number of rooms.[21] Factor analysis was used to obtain the weights that combine the various indicators into a single composite "wealth" score as described in the Appendix. Because wealth in urban and rural areas takes different forms, we decided that a single index was not adequate to rank urban and rural households along a single wealth continuum. We therefore opted to construct separate wealth

[20] We obtained the following test statistics for a Wald test of joint significance: For boys, Model 1 had $\chi^2(52) = 46.24$, p-value= 0.699; Model 2 had $\chi^2(64) = 58.76$, p-value= 0.6617; and Model 3 had $\chi^2(86) = 76.50$, p-value= 0.7586. For girls, Model 1 had $\chi^2(52) = 66.39$, p-value=0.0865; Model 2 had $\chi^2(64) = 73.58$, p-value= 0.1931, and Model 3 had $\chi^2(86) = 99.28$, p-value= 0.1551.

[21] Jensen and Nielsen (1997) found that the presence of household assets led to significantly higher probability of school attendance in Zambia.

scores for urban and rural households. We believe that wealth has a nonlinear positive effect on schooling and a negative effect on work that is strongest at low levels of wealth. To allow for this possibility, we use a more flexible specification of the wealth score instead of entering it linearly. The wealth score is used to construct a series of dummy variables indicating whether the household is in the bottom, next to bottom, or top three quintiles of wealth distribution in urban and rural areas respectively. The set of wealth quintiles variable included in the regression was created by interacting the urban and rural indices (in quintiles) with the corresponding urban/rural dummy variables. This allows the wealth index to differ for urban and rural households. The reference category describes residents of greater Cairo who are in the lowest quintile.

Simulations. Since the marginal effects in binary outcome models are not invariant across individuals, we use a simulation approach to estimate marginal effects for a reference individual. Initially, the reference individual is defined as having zeroes for all the dummy variables and the means of the applicable sample for continuous variables. For the dummy variables in the model we obtain the effect of each variable on the probability of participation in each of the four states as follows:

$$\Delta P_{ij} \Big/ \Delta Z_k = P_{ij}\left(Z \mid Z_k = 1\right) - P_{ij}\left(Z \mid Z_k = 0\right)$$

where i = 0,1 and j = 0,1 and k indicates the k^{th} dummy variable. For continuous variables the marginal effects are calculated on the basis of an infinitesimal change in the relevant variable. The marginal effects are discussed below, along with coefficient estimates, signs, and levels of statistical significance resulting from the bivariate probit analysis. The marginals are necessary to allow us to speak to the magnitudes of particular effects.

We also conduct simulations of the effects of work on schooling by estimating the following "treatment effect": $T_j = \Pr[S_j = 1 | W_j = 1] - \Pr[S_j = 1 | W_j = 0]$, where j indexes an individual with a specific pre-determined profile. We estimate T for the reference boy and girl, a most vulnerable boy and girl, and a least vulnerable boy and girl. To determine the extent to which the prospect of child work reduces schooling by reducing the probability of ever going to school or by increasing the probability of dropout, once enrolled in school, we also estimate T when the schooling variable is "ever in school" or "in school conditional on having been to school in the past."

V. Estimation Results

As described above, we estimate separate models for boys and girls. The two dependent variables take on the value of one when a child is in school and when a child is working. Children are defined as working if they work at least 14 hours per week in the labor force and/or on subsistence production and/or on domestic tasks. In practice, work is by definition more limited for boys, as data on boys' time spent on domestic tasks was not collected. As discussed above, work for boys means market work. The results for boys are shown in Table 3A and for girls in Table 3B.

For each case we estimate a sequential set of models, adding in each subsequent model variables that might be argued to be endogenous. In Model 1, the most basic model, we include the characteristics of the child; parental age and education, and variables indicating the absence of either of the parents, and whether the father's absence is temporary; region; and the household's wealth quintile. In Model 2, we add the father's employment status, and in Model 3, we add the household composition variables. In all models, instruments are included in the work equation for identification purposes. As a general rule, our results on the coefficients of

variables entered earlier are robust to the inclusion of variables entered later, implying that if there is a simultaneity problem, it does not bias the estimates of other statistically signficant explanatory variables. Because child fostering is not common in Egypt, the presence or absence of parents is unlikely to be influenced by the work and school status of children.[22] As a result, Model 1 is our most defensible model. We include Models 2 and 3 despite some misgivings about the possible endogeneity of father's employment status and household composition variables because of our conviction that these are potentially important factors in household decision making. Netz and Haveman (1999) argue strongly for the inclusion of household composition variables in labor force models. The marginal effects shown in Table 4 are based on the Model 1 specification.

We postpone the discussion of the effect of work on schooling and the accompanying simulations, reviewing first the effect of other observable characteristics on both work and schooling. Marginal effects of explanatory variables need to be evaluated in relation to the predicted probability of each work/school state for the reference girl or boy. For the reference boy, who is age 14, the predicted unconditional probability of work is 4.2 percent and that of schooling is 88.7 percent (Table 4). The reference boy is most likely to be going to school and not working – 87.4 percent – but there is a small probability (1.3 percent) of doing both. The probability of working and not going to school (2.9%) is, in fact, lower than the probability of

[22] Although 10% of 6-14 year-olds are not the son/daughter of the household head, in most cases a grandparent is the household head and the parents are living in the household. Only 1.5% of 6-14 year-olds did not live with either parent (n=71); of these, 41% live with grandparents, 15% live with a sibling, 22% live with an uncle or aunt, 2% are servants, and 14% are not related to the household head in any way.

doing neither (8.5%). The reference girl has a much higher predicted probability of working -- 50.5 percent -- keeping in mind that, for girls, work, as we define it, includes domestic work. She also has a lower probability of schooling – 80.7 percent – than her male counterpart. The reference girl is much more likely to combine work and schooling than the reference boy, with a probability of 33.2 percent of doing so, but she also has a significant probability – 17.3 percent – of working and not going to school. The reference girl has a relatively small probability – 2 percent – of neither working nor going to school.

Child characteristics. Virtually all empirical work on child labor has indicated that the age and gender of the child are important determinants of their educational and work activities. The child's relationship to the household head might also have an effect. If the child is a son or daughter of the household head, she or he may be treated differently from other young relatives living with the family, lowering the probability of working and raising the probability of attending school (Levison 1998).

In this study, whether a child is the son or daughter of the household head or some other relative does not have an effect on work and schooling for boys but does affect girls' work, reducing it for younger girls but increasing it for older girls. The effects of age are generally significant and very much as anticipated. Schooling has a concave profile with age, with the probability of schooling increasing for very young children as children who are delaying schooling finally enroll, but then declining as some children drop out after a few years of schooling. According to our estimates, the probability of schooling reaches a maximum at age 10 for boys and at age 13 for girls. As expected, predicted probabilities of work by age (not shown) are very low for very young children and increase monotonically but at a decreasing rate with age.

We include two variables to control for the accessibility of schooling in the child's community: walking time to the nearest school and a dummy indicating that there is no school within walking distance. The variables are defined in an age-appropriate fashion, so that they refer to a primary school for children between 6 and 12, to a lower secondary school for children between 13 and 15, and to an upper secondary school for those 15 to 17. The walking time to school variable was never significant in any of the model specifications for either boys or girls. The dummy for "school not in walking distance" had an unexpected positive effect on schooling for 6-14 year-old boys and a negative effect on work for 6-14 year-old girls. This could be due to the possibility that some survey respondents interpreted the question as referring to the school that the child actually attends rather than to the nearest school. A variable indicating whether or not the child attended a school with multiple shifts – which we had hoped would proxy for school quality – had no explanatory power and was dropped from all models.

Parental characteristics. We hypothesized that parents' ages would affect child activities. Younger parents are likely to be at a more resource-constrained point in their lifecycle and may have less ability to pay school-related fees, as well as a greater need for their children's labor. We include a measure of the father's age when the child was age 6 to capture this effect. Only girls showed any significant negative effect of father's age on work, at a 10 percent significance level in Model 1 and at a 5 percent significance level in Model 3.

Also included is a measure of the age differential between the father and the mother. We hypothesized that the greater the age difference, the greater the power differential is likely to be between the spouses, and the more the father has a greater say in determining child activities vis-à-vis the mother. This might then have implications for, in particular, the education of daughters. The age differential effect is only significant for boys' schooling in Model 3 (and only at the 10

percent level), and the effect is positive. For girls, all three models capture effects of an age differential on schooling, but the positive sign of the effect is counter to our expectations. The positive effect on girls' work in Models 1 and 2 is more in line with our expectations.

There is ample empirical evidence in the literature that the education of the parents decreases the probability of working and increases the probability of schooling (Grootaert and Kanbur, 1995; Tzannatos, 1998; Bhalotra and Heady, 1998; Grootaert, 1998). In our estimates, father's and mother's education are specified as continuous variables; sets of dummy variables were tried as well but were found to provide similar results. Father's but not mother's education has a negative effect on the work of girls in both age groups, as well as on boys' work in Model 1. Both parents' education has a positive effect on boys' and girls' schooling, with the exception of Model 2 for boys, in which the effect of father's education is insignificant. For 6-14 year-old girls, father's and mother's education levels increase the probability of schooling by 2 percentage points for each year of additional schooling. The effect of parents' schooling on the probability of boys' schooling is smaller, at just under 1 percentage point per year of schooling (Table 4).

Rosenzweig (1977) and others argue that the substitutability between the work of girl children and that of the mother makes the mother's employment status endogenous. When mothers work outside the home, girls may stay home to take over their duties, and a mother who has a daughter who is old enough to care for her siblings is more able to engage in labor force work. Because of this we omit the mother's employment status from the explanatory variables. However, father's employment is arguably exogenous to decisions about child activities.

Model 2 is designed to test whether father's main employment status has an additional effect on child work and schooling over and above that of education. In general, adult male workers are expected to have very low elasticity of substitution between market work and

household work. In particular, if the father is engaged in market work, his elasticity of substitution with household work is considered to be zero and all his work hours will be devoted to the market. Based on this assumption, if the father is present in the household, his employment status is exogenous to the child's time allocation. The nature of the father's employment also matters: if the father is unemployed or in irregular employment, a child's labor may be considered a substitute for the father's labor or hired labor, increasing the probability that the child does not go to school. Furthermore, the effect of the father being an employer or self-employed as opposed to an employee is important because it raises the probability that the child will be an unpaid family worker. To allay concerns about endogeneity, we capture the father's employment status at the time the child was 6 years of age rather than at the time of the survey.

A series of dummy variables describes the father's sector and type of employment and employment status. Irregular private sector work is the omitted category. "Regular private sector" jobs consist of permanent and temporary but continuous jobs in the private sector, while "irregular private sector" jobs consist of intermittent and seasonal jobs. Public sector work is typically regular. Non-wage workers are either employers, self-employed workers, or, in some rare cases, unpaid workers for a family enterprise. Non-working fathers are either unemployed or out of the labor force. We expect that fathers in some types of positions are more likely to be able or willing to take their sons to work with them. Non-working fathers may stay home and generate more household work for daughters.

Father's employment sector and status did not turn out to be important determinants of child activities, with two exceptions. Boys 6-14 with fathers employed in the public sector are more likely to go to school, and girls 15-17 are more likely to go to work, than those with fathers in irregular private employment.

When fathers are absent from the household in Egypt, it often implies that they have migrated to an oil-rich Arab country to work; such fathers generally are in contact with their families and may send remittances to them. We therefore distinguish between the temporary absence of the father and his permanent absence, as would be the case for widowed or divorced mothers; our expectation is that a father's permanent absence has more negative consequences for his children than his temporary absence. If a mother is found to be married and her spouse not present, we deem the father's absence temporary. A father's permanent absence has the expected positive effect on work for boys; for older boys, however, this effect is reversed in Models 1 and 2. The negative effect on schooling did not materialize, suggesting that the 10 percentage points reduction in the unconditional probability of schooling observed for a reference 14-year old in Table 4 as a result of the father's permanent absence is mostly due to the effect of increased work on schooling. When the absence is temporary, the adverse effects on work become statistically insignificant, suggesting that the children involved may be benefiting from the effect of remittance income. For girls, the absence of the father, whether permanent or temporary, seems to have few significant effects on either work or schooling, but the absence of both parents appears to substantially increase their likelihood of working, although the effect is statistically significant at the 10 percent level only in Model 3. As shown in Table 4, the unconditional probability of work for 14-year-old reference girl increases by 23.5 percentage points and the unconditional probability of school decreases by 24.5 percentage points when both her parents are absent.

We suspected that children living with their father and a stepmother or with a single father may be treated differently than children living with their father and their birth mother. The estimated effects of the mother-absent dummy variable is indeed very interesting. Boys and

girls living with their fathers but not with their birth mothers have a lower participation in school: the unconditional probability of school for a 14-year-old reference child falls by 24 percentage points for boys and 18.5 for girls (Table 4). At least for boys, the reduced schooling resulting from the absence of the mother does not seem to result in significantly more work. Older girls (ages 15-17) with absent mothers seem to take over at least part of the responsibilities of the missing woman by working more.

Region. For purposes of this analysis, we identify six regions in Egypt. The Greater Cairo region, which includes the entire Cairo urban agglomeration, is the reference region. Alexandria and the Suez Canal cities are lumped together as the other metropolitan region. The non-metropolitan urban regions include urban Lower Egypt, which comprises the cities of the Nile Delta, and urban Upper Egypt, which comprises the cities of the Nile Valley south of Cairo. The rural components of Lower and Upper Egypt are the fifth and sixth region we consider. Upper Egypt, and especially its rural component, is generally considered to be the poorest and most socially conservative region in Egypt

An examination of the descriptive statistics (Table 2a) shows that there are what appear to be large differences among regions in the schooling and work status of boys. For example, boys who combine work and school appear to be disproportionately present in rural areas, especially in rural Upper Egypt. In the multivariate analysis, however, none of the regional dummy variables has an effect on either work or schooling for boys under any of the model specifications examined, except for a negative impact on schooling in Alexandria and Suez Canal and urban and rural Lower Egypt for 15-17 year-old boys. This basically means that, at least for boys, the other explanatory variables we include adequately capture the differences between regions, including the differences between urban and rural areas. In particular, the

household wealth variables we discuss below are defined for urban and rural regions separately and may therefore capture some of the urban/rural differences.[23] The disappearance of the regional effect after the inclusion of the control variables indicates that boys in rural areas do not suffer an intrinsic disadvantage beyond that attributable to the household they are in.

In the case of girls, the descriptive statistics also indicate relatively high rates of schooling and low rates of work in the metropolitan regions. Girls appear to be most disadvantaged in rural Upper Egypt. Unlike boys, however, the multivariate results for girls show that a significant regional effect remains after correcting for household characteristics. Girls in the metropolitan areas of Greater Cairo and Alexandria and the Suez Canal cities are significantly less likely to work than girls in Lower and Upper Egypt, but surprisingly, they are also less likely to go to school than girls in other urban areas. It thus appears that girls in non-metropolitian areas are more able to combine work and school than those in metropolitan areas. The large schooling disadvantage of girls in rural Upper Egypt compared to the metropolitan regions that showed up in the descriptive statistics disappears once other variables, including work, are controlled for. This suggests that the low rates of girls' schooling in Upper Egypt can be attributed more to the fact that they are more likely to work rather than to the social conservatism of the region, as is often assumed.

Wealth. Since child labor is a phenomenon that primarily affects poor children, the top three quintiles of wealth were combined into a single category in the regressions shown in Tables

[23] The regional dummies continue to be insignificant even with the exclusion of the wealth quintile variables. The absence of an urban/rural difference is therefore not result of the inclusion of wealth quintiles defined separately over urban and rural households.

3A and 3B. Wealth has the expected positive effect on schooling of boys and girls with only one exception: there is no measureable effect for boys in the second-lowest rural quintile. This may be the case because relatively more wealthy rural households are more likely to own farms on which boys would be expected to work even when in school.[24] Moving from the lowest to the top three quintiles in urban areas raises the unconditional probability of being in school for a 14-year-old reference boy by 8 percentage points and reduces that of being at work from 4.2 percent to 0.8 percent (Table 4). In rural areas, moving from the bottom to the top three quintiles raises the probability of school by 6.8 percentage points. For urban boys, the joint probability of working and not being in school declines substantially with wealth starting with the second quintile, but for rural boys it only declines for those in the top three quintiles.

Girls' schooling is also highly responsive to changes in wealth, but girls' work is less responsive, although declines relative to the lowest quintiles are found in all but the second lowest urban quintile. Even in the top three urban quintiles, a 14-year-old reference girl has a 40.6 percent unconditional probability of working. Domestic work appears to be part of girls' responsibilities even in middle class households. As wealth increases, rural girls are more likely to combine activities. The joint probability of working and not going to school drops off sharply with wealth for girls, but primarily because the probability of schooling is rising. By the time the top three quintiles of wealth are reached, a 14-year-old reference girl has increased her

[24] Mueller (1984) documents that rural children in Botswana are more likely to work if their families are wealthy enough to own complementary assets, such as land, farming implements, and livestock.

unconditional probability of attending school by 14 percentage points in both urban and rural areas.

Household composition. Detailed age/sex categories for household members were included in Model 3 to examine the effects of household composition on children's work and schooling. Although these variables are potentially endogenous, we are encouraged by the fact that the statistically significant coefficients of other variables in the model remain significant and their magnitudes are robust to within a standard error to the inclusion of the household composition variables. Many other researchers have found that children and adolescents' responsibilities depend on who else is available in the household to do labor force work, household tasks, and child care. Child activities may act as complements or substitutes for the activities of these other household members. The presence of some household members seems to matter most to the extent that they generate household work to be accomplished. Infants and toddlers, for example, require the constant attention of older children or adults, thereby reducing their availability for other work or school activities.

Relatively few of the household composition variables have significant effects on boys' participation in work or school. With other 15-17 year-old males in the household, boys 15-17 are less likely to work. The presence of 15-17 year-old females increases the likelihood of school attendance for the younger boys but decreases it for the older boys. If there are older women (60+ years) in the household, boys are more likely to go to school. Girls' work and schooling are also affected by the composition of their households. Their school attendance is hindered by the presence of children under the age of 2 and between the ages of 6 and 9, as well as by the presence of other girls ages 10-14. They are more likely to attend school the more women above age 60 are in the household. Older girls, however, are more likely to go to school

if there are other 15-17 year-olds. Perhaps because childcare is not captured very well even by our inclusive definition of work, girls' work is not affected by the presence of young children. However, girls' work is increased by the presence of boys ages 10-14 and males age 60 and over, who add to the domestic work burden of the household. Adolescent girls are more likely to work 14+ weekly hours if the household includes girls ages 10-14 or males ages 15-59, while the presence of females 18-59 reduces their probability of working.

The effect of work on schooling. Perhaps the most significant finding of this research is that girls' inclusive work has almost as big a direct effect on schooling as does boys' market work. As shown in Tables 3A and 3B, the coefficient of the "currently working" variable, which indicates the effect of work on the probability of schooling, is negative and highly statistically significant for boys and girls for all models. For boys, the estimate of ρ is positive but very small and statistically insignificant. For girls, large positive and significant estimates of ρ indicate that unobservables that raise the probability of work also raise the probability of schooling, after the impact of work itself is controlled for. Girls who work (mostly in their own homes) appear to be those who would otherwise be more likely to remain in school.

There are two routes whereby children's work may affect their schooling. First, parents who intend their daughters to contribute substantially to household production and their sons to engage in market work may decide that it is not worthwhile to send them to school at all. Second, children who are in school may find work interfering with their ability to maintain their studies – or may find school impeding their work – and then drop out of school. Our main model does not distinguish between these reasons.

We ran two additional sets of models to determine the mechanism by which working reduces children's school attendance (regression results not shown). To examine the effect of

work on intial school entry, we change the dependent variable for schooling to "ever in school or not." To examine the effect of work on school dropout once in school, we use the same dependent variables as in our main model, but with the sample limited to those children who have ever been in school. The effect of work is significant in both additional sets of models for both boys and girls under all three model specifications: the future prospect of work affects school entry, and, for those who do enter school, work increases the likelihood of drop-out. Work does not have to begin at the time the school entry decision is made; parents can decide not to enroll their children in anticipation of putting them to work at a later date.

Simulation results. To estimate the size of the effect of work on schooling, we present in Table 5 simulations based on all three sets of models and the three ways that schooling is defined. In each case, we use the estimated coefficients from the models to predict the conditional probability of school attendance for a boy or girl of given characteristics if he/she works or does not work. The effect is evaluated at the values of the explanatory variables that correspond to the characteristics of a reference boy and girl, a "most-vulnerable" boy and girl, and a "least-vulnerable" boy and girl. The most vulnerable child is similar to the reference child but has parents with no formal schooling, and, in Model 3, lives in a household with one child under two, another between 6 and 9, and a sister between 10 and 14. The least vulnerable child lives in a household in the top three urban wealth quintiles, has a father with 12 years of schooling and a mother with 9, and, in Models 2 and 3, his/her father is a public sector worker (see notes to Table 5).

The simulation results shown in Table 5 are consistent with the scenarios corresponding with the assigned characteristics of the reference boy/girl, most-vulnerable boy/girl, and least-vulnerable boy/girl. In each column, the probabilities of being in school conditional on not

working *and* conditional on working are highest for the least-vulnerable child and lowest for the most-vulnerable child.[25] In addition, the relative effect of work on schooling is smallest for the least-vulnerable child and largest for the most-vulnerable child, with the reference child somewhere in between. These patterns hold for Models 1, 2, and 3. Not only are the most-vulnerable boys and girls least likely to go to school irrespective of work responsibilities, work places them at an even greater disadvantage than it does other children.

In general, the effect of work on school is larger for boys than it is for girls. The reader should keep in mind, however, that because girls are about seven times more likely to work than boys, work has a more disruptive effect on girls' schooling.

To examine whether the effect of work on school acts through initial school entry or through dropout, one can compare results across columns. Comparing the "ever-in-school models" with the dropout models ("currently in school or not, conditional on having been in school") reveals that work has a large negative impact on ever attending school as well as on dropout once attending. As expected, these effects are smaller in magnitude than those for "currently in school or not." For boys, the effect of work on ever going to school and on dropout are of similar magnitudes, or in some cases larger in the case of dropout. In contrast, for the most vulnerable girl, the effect of work on ever going to school is more than twice as large as its effect on dropout. Parents seem to assume that girls have no need for school learning to fulfill

[25] The one exception is that the probabilities of currently being in school conditional on having been in school in the past for the most vulnerable girl are higher than those for the reference girl. This may be because the most vulnerable girls are less likely to go to school at all, so those who attend are more highly selected and have a lower probability of dropout.

their domestic responsibilities, thus greatly increasing the chance that they will remain illiterate for life.

VI. Conclusion

Our objective in this study was to ascertain the effect of child labor on schooling and to determine how various individual and household characteristics affect the chances that a child will go to school and/or participate in other activities that may interfere with schooling. We find a causal relationship between work (broadly defined) and lack of school attendance for both boys and girls. Our estimation method allows us to determine the net impact of work on schooling, correcting for both observable and unobservable characteristics of the child and his or her household. The results indicate that many children who work would have remained in school had they not been working 14+ hours per week. Thus work seems to have a direct and detrimental effect on girls' and boys' schooling.

Although we find that the magnitude of the effect of work on school attendance may be greater for any individual boy than for any individual girl, girls in Egypt are much more likely than boys to find their schooling affected by their work responsibilities. This is because girls are much more likely to do at least 14 hours of work per week than are boys, when domestic work is counted. (See Figure 1 and Table 1.) In the big picture, work is affecting the schooling of many more girls than boys in Egypt. Paradoxically, it is harder to address girls' work through labor policies because the vast majority of girls work at home in subsistence or domestic tasks.

Is it believeable – that domestic tasks affect schooling? In fact, households' need for "chores" – including chores accomplished at particular times of day – can be large and relatively inelastic. Water and/or fuel may have to be gathered from great distances, the day's primary meal may have to be produced from unprocessed materials and made ready in the middle of the

day, the household may include infants or young children requiring constant watching and regular tending, and laundry may need to be washed in the morning so that it will dry before nightfall. The drudgery of everyday life, especially among the poor, should not be underestimated.

The typical image evoked by the words "child labor" is one of a factory worker, toiling long hours, day afer day. In fact, such children are extremely rare; according to one estimate, based on surveys in over 30 low-income countries, only 2.4% of children ages 5-14 work outside of their household for pay (Edwards and Pavcnik, 2004). The majority of child workers are engaged in agricultural production, which may or may not involve long hours or hours likely to conflict with school, depending on the type of production involved – weeding vs. harvesting, for example. Neither weeding nor fetching water has anything inherently wrong with it; most parents will assert that doing small jobs is good for children. The problem, in our view, is when children's jobs, be they officially labor force work or not, interfere substantially with human capital production that will benefit both the children themselves and their society. Our findings indicate the importance of considering non-labor-force work alongside labor force work in studies of child labor.

Our conclusions on the effect of work on schooling rest on how well we are able to identify the structural schooling equation through appropriate exclusion restrictions. We use two sets of instruments: one set that proxies the demand for market work in the locality in which the child lives, and one set that proxies for the demand for domestic work by indicating household access to basic services, like piped water and sanitation. Our proxies for the demand for market work perform well in identifying the models for boys. While we are not as satisfied with the available proxies for domestic work as instruments for girls' work, they perform reasonably well

in our empirical tests. These difficulties are common to the analysis of causal relationships in population and social research. We view this analysis as one contribution to a body of evidence in which different approaches are taken, with the goal of eventually shedding light on these larger social science questions (Moffitt 2005).

Among the other findings, a few stand out as especially interesting or important. Parental absence – a possible targeting indicator – can have serious implications for child activities. The absence of both parents is linked to negative work and school outcomes for girls. The father's permanent but not temporary absence increases a boy's probability of doing market work. The absence of the mother is very problematic for both boys and girls; it has especially large negative effects on the likelihood that they will attend school. Boys have decreased probabilities of both school and work. In the absence of their mother, older girls have a heavier work burden.

Our results indicate that region per se has little effect on the schooling or work of boys, once household characteristics have been taken into account. This suggests that there is not an intrinsic disadvantage due to region, at least for boys. The situation is different for girls. Girls in the metropolitan regions of Greater Cairo, Alexandria and the Suez Canal cities are less likely to work than girls in non-metropolitan urban areas and rural areas, but they are also less likely to go to school. This suggests that it is easier to combine work and schooling in more rural settings than in metropolitan settings.

Household wealth has the expected positive effect on schooling for both boys and girls, but has a substantially smaller effect on work. This is not surprising, since to the degree that our measure of wealth is correlated with household assets such as farm land and livestock, the effects of wealth on reducing the need to work would be counteracted by greater demand for a child's labor to tend to these household assets.

Why is it interesting to know whether child work actually *causes* a reduction in school attendance? It matters because it is important to know whether interventions should target a reduction in child labor or focus exclusively on improving the attractiveness of schooling. Our results imply that direct interventions to reduce child work would increase school attendance. The question is how should such a reduction be achieved. We are not denying that increasing the attractiveness of school through improving school quality or targetted incentives for school attendance might increase school attendance *and* reduce child labor. Our approach does not investigate the causal link from schooling to work.

Given the differences in activities along gender lines, different interventions will need to be adopted for girls and boys. An approach that bans labor force work, and attempts to enforce such a ban, will have limited effects for boys and practically no effect for girls. Since most boys work on family farms or in family enterprises, a legal approach is unlikely to affect them – in general, children are legally allowed to work in family businesses, and even if not, enforceability would be difficult in such circumstances. Families resort to hiring their own children when they face high transaction costs in hiring outside labor (Ben-Porath 1980). Policy changes that reduce such transaction costs may reduce the use of children's labor in family enterprises. For example, the recent changes in Egypt's labor law that reduced barriers to hiring and firing workers may have unintended consequences with respect to children's family labor.

An approach targeting labor market work is unlikely to affect most girls, who work exclusively on subsistence and domestic chores. For girls, an approach that reduces the drudgery of household work would be much more effective in increasing their school attendance. For example, programs to increase access to piped water and sewage systems, provide garbage

collection, ensure adequate energy sources for cooking, and reduce marketing time via refrigeration can have substantial impacts on girls' time use.

Finally, girls are more likely than boys to delay school and to begin working at an earlier age. While girls' work reduces their schooling via both non-entry and dropout, it may be that reducing non-entry would be an easier initial policy objective than reducing dropout. Policy levers to reduce non-entry include linking birth registrations to local school entry lists, subsidization of school-entry-related expenses, and positive, persuasive outreach to parents and step-parents. Young girls, of school-entry age, are relatively unproductive workers, and parents face a small opportunity cost of schooling. Once girls are enrolled, it is then easier to keep track of them as part of the process of reducing dropouts via monitoring school attendance and performance.

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Appendix

Following Filmert and Pritchett (2001) we construct a proxy for household wealth by constructing a linear index from asset ownership indicators using factor analysis to derive appropriate weights. Since we are using the asset index as a proxy for household wealth, it refers to the long-run economic status of households rather than its current poverty or consumption status. Because the relationship between household assets and household wealth may differ significantly between urban and rural contexts, we construct separate asset indices for urban and rural households. We then divide urban and rural households into quintiles based on their asset index scores to create dummy variables for the lowest, second lowest and top three quintiles in urban and rural areas.

The analysis combines measures of wealth that can be broken down conceptually into housing assets, durable goods, and financial assets, as follows:

1- Housing quality variables: number of rooms, quality of material of walls, floor, roof, presence of a telephone, access to the electricity network.[26]

2- Ownership of durable goods including: fridge, freezer, dishwasher, color TV, black and white TV, VCR, air conditioner, microwave, gas stove, kerosene stove, fan, water heater, space heater, sewing machine, iron, radio, washing machine, camera, bicycle, motorcycle or scooter, automobile, taxicab, or truck.

3- Access to interest or dividend income from financial assets and bank deposits.

Like Filmer and Pritchett (2001) we decide to only retain the first factor, which captures the largest amount of information that is common to all the variables. Table A1 reports the scoring coeffecients for this factor. These estimates are obtained using the maximum-likelihood estimation method without rotation, retaining only one factor. The results are very robust to the

[26] Each of these indicators was ranked from worst to best on a two or three point scale.

retention of more factors and to estimation method. Theoretically, the asset index is a standardized variable with zero mean and a standard deviation of 1. The estimation routines never yield a standard deviation of exactly one, unless an exact solution to the factor model is found. Our model yields standard deviations of 0.941 in urban areas and 0.937 in rural areas. Since most variables are measures as 0 or 1, a change from zero to 1 would change the asset score by the value of the variable's coefficient divided by its standard deviation. So, for example, owning a telephone increases the asset score by 0.23 in urban areas and by 0.25 in rural areas. Owning a refrigerator increases it by 0.38 and 0.37 respectively.

Table 1 Weighted Proportions of Children Working and Attending School and Average Hours Worked Boys and Girls Ages 6-17, Egypt, 1998 (Standard Deviations in Parentheses)

	Boys		Girls			
	Market Work Definition^		Market Work Definition^		Inclusive Work Definition^	
	6 to 14	15 to 17	6 to 14	15 to 17	6 to 14	15 to 17
Proportion attending school	0.924	0.727	0.858	0.649	0.858	0.649
	(0.265)	(0.446)	(0.349)	(0.478)	(0.349)	(0.478)
Proportion working (if work hours/week >=14)	0.044	0.229	0.016	0.038	0.319	0.707
	(0.205)	(0.420)	(0.126)	(0.192)	(0.466)	(0.455)
Proportion working (if work hours/week >=1)	0.046	0.243	0.017	0.041	0.426	0.778
	(0.210)	(0.429)	(0.131)	(0.199)	(0.495)	(0.416)
Mutually Exclusive Categories (work >=14 hours/week):						
Proportion in school only	0.908	0.685	0.856	0.646	0.646	0.278
	(0.288)	(0.465)	(0.351)	(0.479)	(0.478)	(0.448)
Proportion who are both at work and in school	0.016	0.042	0.001	0.003	0.212	0.371
	(0.124)	(0.200)	(0.037)	(0.055)	(0.409)	(0.483)
Proportion who only work	0.028	0.187	0.015	0.035	0.107	0.336
	(0.166)	(0.390)	(0.120)	(0.184)	(0.309)	(0.473)
Proportion who are neither at work nor in school	0.048	0.086	0.128	0.316	0.035	0.015
	(0.213)	(0.280)	(0.334)	(0.465)	(0.185)	(0.121)
Average hours worked/week, if work hours > 0	44.2	45.8	49.4	47.3	21.3	29.3
	(22.3)	(20.3)	(22.4)	(20.0)	(16.2)	(17.4)
Average hours worked/week, if work hours >= 14	45.9	47.9	53.1	50.5	25.7	31.1
	(21.4)	(18.8)	(19.1)	(16.9)	(16.1)	(16.8)
Average hours worked/week for those who combine work and school, if work hours >0	24.8	29.3	--	--	15.7	20.2
	(11.4)	(15.4)	--	--	(8.7)	(11.0)
Average hours worked/week for those who combine work and school, if work hours >=14	26.8	32.7	--	--	19.5	22.3
	(10.4)	(14.3)	--	--	(7.9)	(10.4)
Number of Observations	2530	925	2442	865	2442	865

Source: Author's calculations from ELMS 1998

Notes:

^Market work includes only work for purposes of market exchange.

Inclusive work includes market work, subsistence agriculture work and domestic work.

"--" denotes fewer than 10 observations.

Table 2A: Descriptive Statistics, Boys, Market Work Definition

	6 to 14					15 to 17				
Variable Name	All	School only	Work and School	Work Only	Neither	All	School only	Work and School	Work Only	Neither
Child-Specific Characteristics										
age	10.283	10.171	12.886	12.638	10.360	15.950	15.888	15.743	16.171	16.147
	(2.478)	(2.446)	(1.586)	(1.590)	(2.669)	(0.811)	(0.804)	(0.741)	(0.787)	(0.849)
age squared/100	1.119	1.094	1.685	1.622	1.144	2.551	2.531	2.484	2.621	2.614
	(0.504)	(0.495)	(0.380)	(0.364)	(0.541)	(0.259)	(0.257)	(0.236)	(0.253)	(0.272)
not son or daughter of household head	0.096	0.093	0.200	0.072	0.140	0.066	0.060	0.029	0.092	0.080
	(0.294)	(0.290)	(0.406)	(0.261)	(0.349)	(0.248)	(0.238)	(0.169)	(0.290)	(0.273)
time to school if walking, in minutes	(9.065)	(9.022)	(8.457)	(10.435)	(9.320)	(8.495)	(8.638)	(8.429)	(7.816)	(8.640)
	(5.103)	(5.052)	(6.237)	(5.862)	(5.239)	(7.599)	(7.421)	(8.469)	(7.518)	(8.880)
school is not in walking distance	(0.027)	(0.026)	(0.086)	(0.058)	(0.010)	(0.288)	(0.270)	(0.371)	(0.342)	(0.293)
	(0.162)	(0.159)	(0.284)	(0.235)	(0.100)	(0.453)	(0.444)	(0.490)	(0.476)	(0.458)
Parental and HH Characteristics										
father's age when child was age 6	35.398	35.538	36.229	31.841	34.300	34.839	34.756	35.314	36.184	32.627
	(14.799)	(14.535)	(13.602)	(20.210)	(16.675)	(16.026)	(16.041)	(14.634)	(14.806)	(18.721)
difference between father's & mother's age	6.173	6.203	6.486	5.696	5.690	6.342	6.416	7.200	6.224	5.520
	(5.498)	(5.419)	(4.901)	(7.226)	(6.166)	(5.735)	(5.676)	(5.895)	(5.763)	(6.141)
father's years of schooling	7.123	7.473	4.743	2.275	3.170	5.848	6.834	5.771	2.579	3.787
	(5.781)	(5.791)	(4.097)	(3.194)	(4.043)	(5.694)	(5.950)	(5.303)	(3.299)	(4.244)
mother's years of schooling	5.284	5.631	1.971	0.913	1.390	4.057	4.977	3.657	1.250	1.800
	(5.619)	(5.673)	(3.527)	(1.884)	(2.930)	(5.079)	(5.383)	(4.696)	(2.393)	(3.468)
both parents absent	0.014	0.012	0.000	0.014	0.050	0.015	0.012	0.000	0.020	0.040
	(0.117)	(0.111)	(0.000)	(0.120)	(0.219)	(0.122)	(0.109)	(0.000)	(0.140)	(0.197)
father absent permanently	0.057	0.052	0.057	0.203	0.070	0.096	0.100	0.086	0.066	0.133
	(0.232)	(0.222)	(0.236)	(0.405)	(0.256)	(0.295)	(0.300)	(0.284)	(0.249)	(0.342)
father absent temporarily	0.048	0.050	0.029	0.029	0.030	0.032	0.033	0.029	0.026	0.040
	(0.214)	(0.218)	(0.169)	(0.169)	(0.171)	(0.177)	(0.179)	(0.169)	(0.161)	(0.197)
mother absent	0.030	0.025	0.029	0.058	0.130	0.037	0.023	0.029	0.079	0.080
	(0.172)	(0.157)	(0.169)	(0.235)	(0.338)	(0.188)	(0.149)	(0.169)	(0.271)	(0.273)
father irregular private wage worker (reference)	0.130	0.119	0.086	0.217	0.350	0.108	0.086	0.171	0.164	0.160
	(0.337)	(0.324)	(0.280)	(0.412)	(0.477)	(0.311)	(0.280)	(0.377)	(0.371)	(0.367)
father public sector worker when child 6	0.420	0.439	0.314	0.145	0.210	0.428	0.484	0.229	0.250	0.387
	(0.494)	(0.496)	(0.471)	(0.355)	(0.409)	(0.495)	(0.500)	(0.426)	(0.434)	(0.490)
father regular private sector wage worker when child was 6	0.184	0.185	0.086	0.217	0.170	0.173	0.163	0.171	0.224	0.160
	(0.387)	(0.388)	(0.284)	(0.415)	(0.378)	(0.378)	(0.370)	(0.382)	(0.418)	(0.369)
father non wage worker when child was 6	0.236	0.227	0.514	0.406	0.230	0.253	0.232	0.400	0.316	0.240
	(0.425)	(0.419)	(0.507)	(0.495)	(0.423)	(0.435)	(0.423)	(0.497)	(0.466)	(0.430)
father not working or work data missing when child was 6	0.030	0.030	0.000	0.014	0.040	0.038	0.035	0.029	0.046	0.053
	(0.170)	(0.171)	(0.000)	(0.120)	(0.197)	(0.191)	(0.183)	(0.169)	(0.210)	(0.226)
HH has farm entreprise	0.147	0.136	0.657	0.362	0.080	0.146	0.134	0.371	0.211	0.013
	(0.354)	(0.343)	(0.482)	(0.484)	(0.273)	(0.353)	(0.341)	(0.490)	(0.409)	(0.115)
HH has non farm enterprise	0.229	0.234	0.143	0.159	0.190	0.243	0.238	0.286	0.250	0.253
	(0.420)	(0.424)	(0.355)	(0.369)	(0.394)	(0.429)	(0.426)	(0.458)	(0.434)	(0.438)
Wealth										
HH in the lowest urban quintile (reference)	0.158	0.147	0.114	0.348	0.310	0.170	0.139	0.057	0.290	0.253
	(0.365)	(0.354)	(0.318)	(0.476)	(0.462)	(0.375)	(0.346)	(0.232)	(0.454)	(0.435)
HH in 2nd lowest urban quintile	0.113	0.115	0.143	0.101	0.060	0.116	0.122	0.143	0.099	0.080
	(0.317)	(0.319)	(0.355)	(0.304)	(2.386)	(0.320)	(0.328)	(0.355)	(0.299)	(0.273)
HH in top three urban quintiles	0.313	0.335	0.057	0.014	0.090	0.322	0.386	0.314	0.099	0.213
	(0.464)	(0.472)	(0.236)	(0.120)	(0.288)	(0.468)	(0.487)	(0.471)	(0.299)	(0.412)
HH in the lowest rural quintile (reference)	0.079	0.069	0.200	0.174	0.210	0.064	0.051	0.057	0.086	0.133
	(0.270)	(0.254)	(0.400)	(0.379)	(0.407)	(0.244)	(0.221)	(0.232)	(0.280)	(0.340)
HH in 2nd lowest rural quintile	0.078	0.069	0.143	0.159	0.200	0.075	0.056	0.086	0.138	0.107
	(0.268)	(0.254)	(0.355)	(0.369)	(0.402)	(0.263)	(0.230)	(0.284)	(0.346)	(0.311)
HH in top three rural quintiles	0.258	0.264	0.343	0.203	0.130	0.254	0.246	0.343	0.289	0.213
	(0.438)	(0.441)	(0.482)	(0.405)	(0.338)	(0.436)	(0.431)	(0.482)	(0.455)	(0.412)
Regional & Neighborhood Characteristics										
Greater Cairo (reference)	0.134	0.140	0.029	0.058	0.090	0.172	0.196	0.286	0.072	0.107
	(0.341)	(0.347)	(0.167)	(0.234)	(0.286)	(0.377)	(0.397)	(0.452)	(0.259)	(0.309)
Alexandria and Suez Canal	0.112	0.117	0.000	0.058	0.080	0.107	0.118	0.029	0.046	0.173
	(0.315)	(0.321)	(0.000)	(0.235)	(0.273)	(0.309)	(0.322)	(0.169)	(0.210)	(0.381)
Urban Lower Egypt	0.144	0.148	0.000	0.145	0.100	0.146	0.145	0.000	0.191	0.133
	(0.351)	(0.355)	(0.000)	(0.355)	(0.302)	(0.353)	(0.352)	(0.000)	(0.394)	(0.342)
Urban Upper Egypt	0.194	0.193	0.286	0.203	0.190	0.183	0.189	0.200	0.178	0.133
	(0.396)	(0.394)	(0.458)	(0.405)	(0.394)	(0.387)	(0.391)	(0.406)	(0.383)	(0.342)
Rural Lower Egypt	0.219	0.221	0.200	0.261	0.140	0.219	0.202	0.200	0.296	0.227
	(0.413)	(0.415)	(0.406)	(0.442)	(0.349)	(0.414)	(0.402)	(0.406)	(0.458)	(0.421)
Rural Upper Egypt	0.197	0.182	0.486	0.275	0.400	0.173	0.151	0.286	0.217	0.227
	(0.398)	(0.386)	(0.507)	(0.450)	(0.492)	(0.378)	(0.358)	(0.458)	(0.414)	(0.421)
% female w/ secondary school or above in locality	20.705	21.182	12.156	16.983	15.162	21.381	22.900	17.965	17.191	18.042
	(12.336)	(12.371)	(9.204)	(9.974)	(11.116)	(12.745)	(13.248)	(12.094)	(10.033)	(10.590)
% male w/ secondary school or above in locality	29.806	30.269	23.341	25.285	24.417	30.490	32.002	28.015	26.037	27.308
	(11.649)	(11.683)	(9.989)	(9.361)	(10.158)	(11.999)	(12.571)	(11.804)	(8.966)	(9.035)

Table 2A (Contn'd): Descriptive Statistics, Boys, Market Work Definition

	6 to 14					15 to 17				
Variable Name	All	School only	Work and School	Work Only	Neither	All	School only	Work and School	Work Only	Neither
Child-Specific Characteristics										
Instruments										
% agricultural workers in locality	10.606	10.182	17.810	14.655	15.161	9.965	9.013	11.664	13.268	10.887
	(10.471)	(10.293)	(9.120)	(11.654)	(11.674)	(10.363)	(10.030)	(10.922)	(10.788)	(10.777)
% service & trade workers in locality	4.198	4.205	4.409	4.459	3.781	4.130	4.155	4.315	3.999	4.090
	(1.547)	(1.545)	(1.247)	(1.653)	(1.552)	(1.497)	(1.488)	(1.297)	(1.503)	(1.658)
% craft workers in locality	7.443	7.490	5.558	7.700	6.840	7.700	7.687	7.636	7.686	7.875
	(4.097)	(4.099)	(3.248)	(4.314)	(4.003)	(4.102)	(4.136)	(3.977)	(3.812)	(4.483)
HH without piped water	0.106	0.094	0.229	0.333	0.190	0.089	0.069	0.143	0.125	0.160
	(0.308)	(0.292)	(0.426)	(0.475)	(0.394)	(0.284)	(0.254)	(0.355)	(0.332)	(0.369)
HH without piped sewage disposal	0.472	0.454	0.829	0.681	0.620	0.435	0.382	0.571	0.612	0.480
	(0.499)	(0.498)	(0.382)	(0.469)	(0.488)	(0.496)	(0.486)	(0.502)	(0.489)	(0.503)
HH without garbage collection	0.594	0.577	0.886	0.783	0.760	0.533	0.490	0.600	0.645	0.653
	(0.491)	(0.494)	(0.323)	(0.415)	(0.429)	(0.499)	(0.500)	(0.497)	(0.480)	(0.479)
Household Composition										
# of children ages 0-2 in HH	0.321	0.313	0.371	0.362	0.450	0.221	0.193	0.343	0.303	0.240
	(0.562)	(0.559)	(0.547)	(0.542)	(0.642)	(0.525)	(0.515)	(0.539)	(0.540)	(0.566)
# of children ages 3-5 in HH	0.465	0.465	0.514	0.420	0.490	0.283	0.252	0.314	0.441	0.227
	(0.655)	(0.657)	(0.702)	(0.604)	(0.643)	(0.546)	(0.526)	(0.530)	(0.638)	(0.481)
# of children ages 6-9 in HH	0.527	0.520	0.743	0.551	0.600	0.399	0.376	0.714	0.441	0.373
	(0.717)	(0.714)	(0.817)	(0.738)	(0.711)	(0.666)	(0.666)	(0.710)	(0.688)	(0.564)
# of girls ages 10-14 in HH	0.472	0.467	0.600	0.420	0.560	0.475	0.454	0.514	0.559	0.467
	(0.657)	(0.655)	(0.812)	(0.604)	(0.671)	(0.655)	(0.653)	(0.612)	(0.688)	(0.622)
# of boys ages 10-14 in HH	0.447	0.438	0.571	0.638	0.490	0.565	0.537	0.714	0.678	0.520
	(0.652)	(0.644)	(0.815)	(0.822)	(0.628)	(0.711)	(0.698)	(0.667)	(0.751)	(0.742)
# of females ages 15-17 in HH	0.279	0.275	0.457	0.464	0.170	0.197	0.186	0.171	0.230	0.240
	(0.530)	(0.530)	(0.657)	(0.558)	(0.403)	(0.424)	(0.408)	(0.382)	(0.481)	(0.460)
# of males ages 15-17 in HH	0.278	0.271	0.514	0.348	0.320	1.192	1.205	1.171	1.158	1.160
	(0.509)	(0.506)	(0.612)	(0.510)	(0.530)	(0.434)	(0.450)	(0.382)	(0.400)	(0.369)
# of females ages 18-59 in HH	0.435	0.423	0.857	0.449	0.540	0.602	0.584	0.486	0.691	0.640
	(0.842)	(0.830)	(1.115)	(0.758)	(1.009)	(0.849)	(0.852)	(0.702)	(0.871)	(0.832)
# of males ages 18-59 in HH	0.550	0.535	0.914	0.870	0.560	0.932	0.900	0.886	1.099	0.893
	(0.908)	(0.900)	(0.887)	(1.136)	(0.868)	(1.077)	(1.070)	(1.078)	(1.155)	(0.967)
# of females age 60 and over in HH	0.134	0.133	0.257	0.116	0.120	0.102	0.098	0.143	0.112	0.093
	(0.351)	(0.351)	(0.443)	(0.323)	(0.327)	(0.316)	(0.317)	(0.355)	(0.316)	(0.293)
# of males age 60 and over in HH	0.060	0.060	0.086	0.029	0.060	0.041	0.038	0.000	0.059	0.053
	(0.237)	(0.238)	(0.284)	(0.169)	(0.239)	(0.199)	(0.191)	(0.000)	(0.237)	(0.226)
Number of Observations	**2530**	**2326**	**35**	**69**	**100**	**925**	**663**	**35**	**152**	**75**

Standard deviations in parentheses

Table 2B: Descriptive Statistics, Girls, Inclusive Work Definition

	6 to 14					15 to 17				
Variable Name	All	School only	Work and School	Work Only	Neither	All	School only	Work and School	Work Only	Neither
Child Characteristics										
age	10.379	9.807	11.818	11.650	9.014	15.954	15.762	15.954	16.149	16.154
	(2.471)	(2.415)	(1.883)	(2.037)	(2.805)	(0.828)	(0.807)	(0.805)	(0.841)	(0.801)
age squared/100	1.138	1.020	1.432	1.399	0.890	2.552	2.491	2.552	2.615	2.615
	(0.503)	(0.480)	(0.420)	(0.445)	(0.535)	(0.265)	(0.257)	(0.257)	(0.270)	(0.257)
not son or daughter of household head	0.087	0.093	0.071	0.087	0.071	0.067	0.031	0.095	0.066	0.077
	(0.282)	(0.291)	(0.258)	(0.283)	(0.259)	(0.250)	(0.173)	(0.293)	(0.249)	(0.277)
time to school if walking, in minutes	9.071	8.867	9.426	9.664	9.386	8.518	8.889	9.003	7.607	5.000
	(5.011)	(4.844)	(5.278)	(5.112)	(6.142)	(7.959)	(7.148)	(8.295)	(8.341)	(4.564)
school is not in walking distance	0.027	0.026	0.036	0.010	0.029	0.305	0.238	0.281	0.409	0.385
	(0.161)	(0.158)	(0.186)	(0.098)	(0.168)	(0.461)	(0.426)	(0.450)	(0.493)	(0.506)
Parental and HH Characteristics										
father's age when child was age 6	36.149	36.239	35.690	36.034	37.900	33.192	34.981	33.089	31.512	31.308
	(14.636)	(14.377)	(14.965)	(15.767)	(14.780)	(16.420)	(14.139)	(16.201)	(18.616)	(19.435)
difference between father's & mother's age	6.425	6.299	6.602	7.252	5.586	5.638	5.701	5.713	5.541	4.154
	(5.359)	(5.175)	(5.529)	(5.879)	(6.394)	(5.274)	(4.861)	(4.970)	(6.093)	(5.129)
father's years of schooling	7.249	8.241	6.696	1.903	4.043	6.238	9.280	6.547	2.674	3.231
	(5.862)	(5.884)	(5.444)	(2.792)	(4.880)	(5.813)	(5.987)	(5.570)	(3.695)	(3.539)
mother's years of schooling	5.434	6.394	4.822	0.641	1.814	3.960	6.605	4.011	1.112	2.462
	(5.715)	(5.870)	(5.211)	(1.707)	(3.987)	(5.060)	(5.731)	(4.972)	(2.129)	(2.367)
both parents absent	0.015	0.007	0.015	0.063	0.043	0.047	0.008	0.032	0.112	0.077
	(0.121)	(0.085)	(0.122)	(0.244)	(0.204)	(0.213)	(0.087)	(0.175)	(0.315)	(0.277)
father absent permanently	0.052	0.051	0.060	0.044	0.014	0.090	0.069	0.100	0.095	0.154
	(0.221)	(0.221)	(0.238)	(0.205)	(0.120)	(0.287)	(0.254)	(0.301)	(0.294)	(0.376)
father absent temporarily	0.045	0.049	0.039	0.024	0.043	0.030	0.038	0.032	0.021	0.000
	(0.207)	(0.216)	(0.195)	(0.154)	(0.204)	(0.171)	(0.192)	(0.175)	(0.143)	(0.000)
mother absent	0.030	0.020	0.026	0.083	0.143	0.076	0.019	0.052	0.174	0.077
	(0.170)	(0.139)	(0.160)	(0.276)	(0.352)	(0.266)	(0.137)	(0.221)	(0.380)	(0.277)
father irregular private wage worker	0.139	0.111	0.133	0.359	0.171	0.127	0.084	0.100	0.202	0.308
(reference)	(0.346)	(0.315)	(0.340)	(0.480)	(0.377)	(0.333)	(0.278)	(0.300)	(0.402)	(0.462)
father public sector worker when child 6	0.422	0.465	0.417	0.150	0.271	0.439	0.536	0.484	0.289	0.077
	(0.494)	(0.499)	(0.493)	(0.358)	(0.448)	(0.497)	(0.500)	(0.500)	(0.454)	(0.277)
father regular private sector wage worker	0.177	0.173	0.182	0.189	0.200	0.157	0.149	0.140	0.182	0.308
when child was age 6	(0.382)	(0.379)	(0.386)	(0.393)	(0.403)	(0.364)	(0.357)	(0.348)	(0.386)	(0.480)
father nonwage worker when child 6	0.226	0.214	0.235	0.277	0.314	0.249	0.203	0.249	0.298	0.231
	(0.419)	(0.410)	(0.424)	(0.448)	(0.468)	(0.432)	(0.403)	(0.433)	(0.458)	(0.439)
father not working or work data missing	0.035	0.037	0.034	0.024	0.043	0.028	0.027	0.026	0.029	0.077
when child was age 6	(0.184)	(0.188)	(0.181)	(0.154)	(0.204)	(0.164)	(0.162)	(0.159)	(0.168)	(0.277)
HH has farm enterprise	0.131	0.113	0.137	0.233	0.214	0.161	0.073	0.140	0.281	0.231
	(0.338)	(0.316)	(0.344)	(0.424)	(0.413)	(0.367)	(0.260)	(0.348)	(0.450)	(0.439)
HH has nonfarm enterprise	0.226	0.244	0.225	0.112	0.143	0.223	0.268	0.244	0.153	0.077
	(0.418)	(0.429)	(0.418)	(0.316)	(0.352)	(0.417)	(0.444)	(0.430)	(0.361)	(0.277)
Wealth										
HH in the lowest urban quintile (reference)	0.157	0.142	0.160	0.228	0.286	0.136	0.065	0.149	0.194	0.154
	(0.364)	(0.349)	(0.366)	(0.420)	(0.452)	(0.343)	(0.247)	(0.356)	(0.396)	(0.361)
HH in 2nd lowest urban quintile	0.127	0.130	0.139	0.083	0.086	0.147	0.126	0.158	0.161	0.000
	(0.333)	(0.336)	(0.346)	(0.276)	(0.282)	(0.354)	(0.333)	(0.365)	(0.368)	(0.000)
HH in top three urban quintile	0.333	0.400	0.272	0.039	0.100	0.304	0.513	0.307	0.074	0.308
	(0.471)	(0.490)	(0.445)	(0.194)	(0.302)	(0.460)	(0.501)	(0.462)	(0.263)	(0.480)
HH in the lowest rural quintile (reference)	0.105	0.065	0.079	0.315	0.345	0.121	0.050	0.067	0.238	0.145
	(0.307)	(0.247)	(0.271)	(0.466)	(0.479)	(0.326)	(0.217)	(0.251)	(0.427)	(0.367)
HH in 2nd lower rural quintile	0.077	0.064	0.073	0.180	0.129	0.068	0.061	0.049	0.099	0.154
	(0.267)	(0.244)	(0.261)	(0.385)	(0.337)	(0.252)	(0.240)	(0.216)	(0.300)	(0.376)
HH in top three rural quintile	0.246	0.231	0.306	0.214	0.214	0.269	0.215	0.295	0.285	0.385
	(0.431)	(0.421)	(0.461)	(0.411)	(0.413)	(0.444)	(0.411)	(0.457)	(0.452)	(0.506)
Regional & Neighborhood Characteristics										
Greater Cairo (reference)	0.169	0.198	0.124	0.087	0.071	0.161	0.230	0.143	0.116	0.077
	(0.375)	(0.399)	(0.329)	(0.282)	(0.258)	(0.367)	(0.421)	(0.350)	(0.320)	(0.266)
Alexandria and Suez Canal	0.120	0.141	0.079	0.063	0.100	0.123	0.176	0.106	0.091	0.077
	(0.325)	(0.349)	(0.270)	(0.244)	(0.302)	(0.328)	(0.382)	(0.308)	(0.288)	(0.277)
Urban Lower Egypt	0.146	0.141	0.188	0.073	0.157	0.150	0.161	0.178	0.099	0.154
	(0.353)	(0.349)	(0.391)	(0.260)	(0.367)	(0.358)	(0.368)	(0.383)	(0.300)	(0.376)
Urban Upper Egypt	0.181	0.190	0.180	0.126	0.143	0.154	0.138	0.186	0.124	0.154
	(0.385)	(0.393)	(0.385)	(0.333)	(0.352)	(0.361)	(0.345)	(0.390)	(0.330)	(0.376)
Rural Lower Egypt	0.199	0.178	0.257	0.223	0.186	0.228	0.161	0.241	0.281	0.231
	(0.399)	(0.382)	(0.437)	(0.417)	(0.392)	(0.420)	(0.368)	(0.428)	(0.450)	(0.439)
Rural Upper Egypt	0.184	0.151	0.173	0.427	0.343	0.185	0.134	0.146	0.289	0.308
	(0.388)	(0.358)	(0.378)	(0.496)	(0.478)	(0.388)	(0.341)	(0.354)	(0.454)	(0.480)
% female w/secondary school or above in	20.983	22.468	20.323	13.736	12.695	21.281	25.457	22.249	15.626	16.764
locality	(12.120)	(12.092)	(10.012)	(13.716)	(11.131)	(12.502)	(12.832)	(11.888)	(10.958)	(10.082)
% male w/secondary school or above in	30.081	31.618	28.770	23.780	22.757	30.533	34.308	31.377	25.510	25.564
locality	(11.550)	(11.606)	(9.356)	(13.064)	(10.432)	(11.880)	(12.341)	(11.575)	(10.081)	(8.279)

Table 2B (Contn'd): Descriptive Statistics, Girls, Inclusive Work Definition

	6 to 14					15 to 17				
Variable Name	All	School only	Work and School	Work Only	Neither	All	School only	Work and School	Work Only	Neither
Instruments										
% agricultural workers in locality	9.910	8.626	10.240	17.045	16.354	10.217	7.618	9.469	14.111	9.995
	(10.294)	(9.750)	(9.701)	(11.632)	(11.758)	(10.449)	(9.615)	(9.954)	(11.011)	(8.977)
% service & trade workers in locality	4.233	4.306	4.181	3.921	3.849	4.195	4.283	4.239	4.023	4.462
	(1.525)	(1.527)	(1.454)	(1.582)	(1.666)	(1.540)	(1.405)	(1.553)	(1.648)	(1.607)
% craft workers in locality	7.632	7.686	8.013	6.526	6.737	7.364	7.530	7.380	7.077	8.905
	(4.072)	(3.951)	(4.195)	(4.239)	(4.748)	(4.042)	(3.822)	(3.925)	(4.434)	(3.631)
HH without piped water	0.090	0.050	0.099	0.340	0.229	0.094	0.069	0.060	0.165	0.154
	(0.287)	(0.218)	(0.300)	(0.475)	(0.423)	(0.291)	(0.254)	(0.238)	(0.372)	(0.376)
HH without piped sewage disposal	0.438	0.381	0.478	0.723	0.629	0.435	0.276	0.444	0.591	0.462
	(0.496)	(0.486)	(0.500)	(0.448)	(0.487)	(0.496)	(0.448)	(0.498)	(0.493)	(0.519)
HH without garbage collection	0.557	0.499	0.612	0.811	0.757	0.590	0.441	0.582	0.756	0.692
	(0.497)	(0.500)	(0.488)	(0.393)	(0.432)	(0.492)	(0.497)	(0.494)	(0.430)	(0.480)
Household Composition										
# of children ages 0-2 in HH	0.327	0.310	0.304	0.379	0.757	0.195	0.138	0.149	0.314	0.385
	(0.561)	(0.549)	(0.557)	(0.525)	(0.788)	(0.464)	(0.416)	(0.402)	(0.555)	(0.650)
# of children ages 3-5 in HH	0.520	0.527	0.445	0.641	0.571	0.298	0.253	0.289	0.364	0.231
	(0.677)	(0.679)	(0.622)	(0.757)	(0.714)	(0.556)	(0.509)	(0.556)	(0.597)	(0.599)
# of children ages 6-9 in HH	0.552	0.522	0.525	0.786	0.757	0.462	0.395	0.424	0.579	0.692
	(0.706)	(0.694)	(0.662)	(0.840)	(0.731)	(0.685)	(0.621)	(0.628)	(0.781)	(1.109)
# of girls ages 10-14 in HH	0.457	0.449	0.394	0.621	0.629	0.550	0.475	0.559	0.607	0.769
	(0.636)	(0.637)	(0.574)	(0.700)	(0.765)	(0.702)	(0.665)	(0.678)	(0.756)	(0.927)
# of boys ages 10-14 in HH	0.458	0.440	0.482	0.597	0.300	0.573	0.452	0.596	0.665	0.692
	(0.641)	(0.631)	(0.665)	(0.631)	(0.645)	(0.718)	(0.652)	(0.707)	(0.794)	(0.480)
# of females ages 15-17 in HH	0.274	0.255	0.296	0.325	0.371	1.245	1.199	1.269	1.256	1.308
	(0.528)	(0.506)	(0.561)	(0.606)	(0.516)	(0.454)	(0.437)	(0.457)	(0.456)	(0.630)
# of males ages 15-17 in HH	0.257	0.237	0.285	0.286	0.414	0.208	0.161	0.221	0.240	0.231
	(0.489)	(0.473)	(0.514)	(0.494)	(0.602)	(0.439)	(0.368)	(0.455)	(0.482)	(0.439)
# of females ages 18-59 in HH	0.429	0.419	0.422	0.519	0.457	0.594	0.552	0.607	0.603	0.923
	(0.809)	(0.815)	(0.802)	(0.795)	(0.755)	(0.838)	(0.776)	(0.889)	(0.815)	(1.038)
# of males ages 18-59 in HH	0.537	0.481	0.615	0.743	0.657	0.844	0.571	0.874	1.058	1.538
	(0.886)	(0.853)	(0.932)	(0.951)	(0.946)	(0.967)	(0.827)	(0.986)	(0.992)	(1.198)
# of females age 60 and over in HH	0.132	0.135	0.131	0.121	0.100	0.116	0.084	0.132	0.132	0.000
	(0.346)	(0.349)	(0.344)	(0.342)	(0.302)	(0.331)	(0.278)	(0.355)	(0.351)	(0.000)
# of males age 60 and over in HH	0.064	0.066	0.062	0.058	0.057	0.040	0.019	0.063	0.033	0.000
	(0.245)	(0.249)	(0.241)	(0.235)	(0.234)	(0.197)	(0.137)	(0.243)	(0.179)	(0.000)
Number of Observations	**2442**	**1633**	**533**	**206**	**70**	**865**	**261**	**349**	**242**	**13**

Standard deviations in parentheses

Table 3A: Parameter Estimates from Bivariate Probit Model, Boys, Market Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
working			-2.086	-0.203			-2.399	-0.141			-2.526	-0.092
			(0.629)**	(0.216)			(0.681)**	(0.241)			(0.693)**	(0.248)
age	0.342		0.462		0.360		0.475		0.346		0.416	
	(0.172)**		(0.118)**		(0.181)**		(0.122)**		(0.186)*		(0.126)**	
age squared/100	-0.274		-2.315		-0.283		-2.358		-0.181		-2.135	
	(0.691)		(0.581)**		(0.723)		(0.608)**		(0.739)		(0.623)**	
not son or daughter of household head	0.164	0.041	0.053	-0.127	0.030	0.084	-0.059	-0.063	0.004	0.101	-0.249	0.319
	(0.200)	(0.297)	(0.179)	(0.321)	(0.217)	(0.312)	(0.181)	(0.333)	(0.279)	(0.381)	(0.232)	(0.406)
time to school if walking, in minutes	0.003	0.000	-0.003	0.001	0.005	-0.003	-0.001	-0.001	0.003	-0.003	0.000	-0.003
	(0.010)	(0.014)	(0.009)	(0.014)	(0.011)	(0.015)	(0.010)	(0.015)	(0.011)	(0.015)	(0.010)	(0.015)
school is not in walking distance	-0.083	0.053	0.680	-0.509	-0.082	0.047	0.665	-0.497	-0.069	-0.026	0.735	-0.567
	(0.290)	(0.334)	(0.357)*	(0.400)	(0.306)	(0.349)	(0.360)*	(0.405)	(0.308)	(0.352)	(0.375)**	(0.420)
father's age when age 6	0.014	-0.016	-0.001	-0.013	0.013	-0.010	-0.003	-0.011	0.014	-0.002	-0.012	-0.001
	(0.009)	(0.012)	(0.008)	(0.013)	(0.010)	(0.013)	(0.008)	(0.013)	(0.012)	(0.016)	(0.009)	(0.016)
difference between father's & mother's age	-0.018	0.011	0.010	0.016	-0.017	0.006	0.014	0.018	-0.019	0.002	0.022	0.008
	(0.013)	(0.018)	(0.011)	(0.019)	(0.014)	(0.019)	(0.012)	(0.020)	(0.015)	(0.021)	(0.012)*	(0.021)
father's years of schooling	-0.032	-0.009	0.028	-0.007	-0.022	-0.007	0.022	-0.003	-0.020	-0.012	0.025	-0.006
	(0.016)**	(0.021)	(0.014)**	(0.021)	(0.018)	(0.023)	(0.014)	(0.023)	(0.018)	(0.023)	(0.015)*	(0.023)
mother's years of schooling	-0.031	-0.008	0.044	0.010	-0.033	-0.004	0.046	0.011	-0.033	-0.003	0.050	0.009
	(0.021)	(0.027)	(0.017)**	(0.027)	(0.022)	(0.028)	(0.017)**	(0.027)	(0.022)	(0.029)	(0.018)**	(0.028)
both parents absent	-0.397	-0.774	0.034	-0.640	-0.557	-0.351	0.017	-0.531	-0.451	0.113	-0.264	-0.317
	(0.781)	(0.996)	(0.498)	(0.889)	(0.826)	(1.044)	(0.508)	(0.909)	(0.878)	(1.123)	(0.545)	(1.003)
father absent permanently	0.693	-1.260	-0.134	-0.180	0.745	-1.045	-0.152	-0.041	0.810	-0.730	-0.423	0.297
	(0.371)*	(0.511)**	(0.330)	(0.539)	(0.393)*	(0.536)*	(0.341)	(0.549)	(0.485)*	(0.648)	(0.399)	(0.644)
father absent temporarily	0.134	-0.428	0.284	-0.815	0.150	-0.223	0.333	-0.752	0.240	-0.049	0.205	-0.587
	(0.457)	(0.632)	(0.381)	(0.613)	(0.474)	(0.649)	(0.394)	(0.631)	(0.517)	(0.707)	(0.429)	(0.695)
mother absent (w/ or w/o a stepmother present)	0.400	0.367	-0.811	0.434	0.484	0.339	-0.766	0.462	0.518	0.244	-0.772	0.425
	(0.352)	(0.476)	(0.266)**	(0.487)	(0.361)	(0.490)	(0.278)**	(0.504)	(0.362)	(0.498)	(0.285)**	(0.517)
father public sector worker when child was 6					-0.286	-0.154	0.323	-0.381	-0.314	-0.112	0.319	-0.323
					(0.204)	(0.276)	(0.152)**	(0.263)	(0.206)	(0.280)	(0.157)**	(0.268)
father regular private sector wage worker when child was					0.130	-0.115	0.224	-0.246	0.115	-0.088	0.252	-0.217
					(0.200)	(0.275)	(0.157)	(0.275)	(0.204)	(0.281)	(0.160)	(0.281)
father nonwage worker when child was 6					0.089	-0.305	0.016	-0.150	0.074	-0.291	-0.018	-0.069
					(0.202)	(0.279)	(0.172)	(0.286)	(0.204)	(0.283)	(0.177)	(0.295)
father not working or work data missing when child was 6					-0.589	0.499	-0.078	-0.104	-0.656	0.567	-0.076	-0.029
					(0.491)	(0.576)	(0.287)	(0.449)	(0.494)	(0.584)	(0.304)	(0.470)
farm entreprise					0.712	-0.203	0.778	0.197	0.716	-0.147	0.845	0.164
					(0.177)**	(0.250)	(0.216)**	(0.305)	(0.179)**	(0.255)	(0.225)**	(0.317)
non-farm entreprise					0.066	0.199	0.219	-0.109	0.068	0.199	0.215	-0.095
					(0.182)	(0.231)	(0.148)	(0.226)	(0.183)	(0.234)	(0.152)	(0.231)

Table 3A (Contn'd): Parameter Estimates from Bivariate Probit Model, Boys, Market Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
HH in 2nd lowest urban wealth quintile	0.096	-0.242	0.510	-0.040	0.160	-0.319	0.489	-0.023	0.151	-0.259	0.460	0.013
	(0.204)	(0.283)	(0.191)**	(0.300)	(0.213)	(0.291)	(0.196)**	(0.309)	(0.217)	(0.297)	(0.198)**	(0.314)
HH in top three urban wealth quintiles	-0.681	0.370	0.551	-0.155	-0.698	0.284	0.521	-0.153	-0.713	0.355	0.540	-0.156
	(0.281)**	(0.339)	(0.196)**	(0.287)	(0.299)**	(0.358)	(0.200)**	(0.297)	(0.303)**	(0.365)	(0.206)**	(0.305)
HH in 2nd lowest rural wealth quintile	0.329	-0.044	-0.117	0.393	0.267	0.075	-0.202	0.494	0.273	0.097	-0.221	0.477
	(0.221)	(0.337)	(0.176)	(0.332)	(0.233)	(0.348)	(0.183)	(0.344)	(0.237)	(0.355)	(0.189)	(0.353)
HH in top three rural wealth quintiles	-0.066	0.100	0.544	0.012	-0.072	0.089	0.419	0.051	-0.100	0.122	0.383	0.101
	(0.211)	(0.307)	(0.176)**	(0.298)	(0.225)	(0.322)	(0.189)**	(0.315)	(0.229)	(0.329)	(0.197)*	(0.326)
Alexandria and Suez Canal	-0.226	-0.295	0.060	-0.655	-0.136	-0.428	0.077	-0.741	-0.188	-0.338	0.114	-0.786
	(0.338)	(0.425)	(0.229)	(0.338)*	(0.342)	(0.433)	(0.233)	(0.344)**	(0.348)	(0.439)	(0.238)	(0.349)**
Urban Lower Egypt	0.276	-0.125	0.180	-0.553	0.108	0.047	0.149	-0.594	0.088	0.048	0.186	-0.611
	(0.306)	(0.381)	(0.215)	(0.322)*	(0.317)	(0.391)	(0.220)	(0.331)*	(0.318)	(0.394)	(0.224)	(0.340)*
Urban Upper Egypt	0.487	-0.556	0.065	-0.043	0.375	-0.526	0.009	-0.082	0.306	-0.475	0.028	-0.190
	(0.290)*	(0.368)	(0.209)	(0.325)	(0.303)	(0.383)	(0.211)	(0.332)	(0.308)	(0.393)	(0.218)	(0.344)
Rural Lower Egypt	0.015	-0.213	0.280	-0.674	-0.002	-0.260	0.340	-0.836	-0.016	-0.207	0.367	-0.900
	(0.363)	(0.491)	(0.258)	(0.425)	(0.380)	(0.508)	(0.264)	(0.438)*	(0.382)	(0.513)	(0.270)	(0.446)**
Rural Upper Egypt	0.432	-0.552	-0.187	-0.209	0.411	-0.631	-0.126	-0.397	0.423	-0.656	-0.056	-0.550
	(0.374)	(0.516)	(0.268)	(0.445)	(0.394)	(0.540)	(0.273)	(0.461)	(0.397)	(0.549)	(0.280)	(0.470)
% female w/ secondary school or above	0.038	-0.018	-0.048	0.033	0.046	-0.026	-0.041	0.040	0.050	-0.030	-0.042	0.037
	(0.020)*	(0.027)	(0.015)**	(0.023)	(0.021)**	(0.028)	(0.016)**	(0.024)*	(0.021)**	(0.029)	(0.016)**	(0.025)
% male w/ secondary school or above	-0.023	0.002	0.048	-0.027	-0.022	-0.001	0.045	-0.035	-0.024	0.002	0.046	-0.033
	(0.021)	(0.029)	(0.015)**	(0.022)	(0.022)	(0.030)	(0.015)**	(0.023)	(0.022)	(0.031)	(0.016)**	(0.024)
% agricultural workers in locality (X)	0.028	-0.098			0.028	-0.078			0.027	-0.093		
	(0.013)**	(0.062)			(0.013)**	(0.065)			(0.014)**	(0.066)		
% service & trade workers in locality (X)	0.158	-0.017			0.137	-0.022			0.138	-0.020		
	(0.044)**	(0.019)			(0.046)**	(0.019)			(0.047)**	(0.020)		
% craft workers in locality (X)	0.047	-0.018			0.056	-0.027			0.054	-0.019		
	(0.027)*	(0.037)			(0.028)**	(0.038)			(0.028)*	(0.039)		
household without piped water (X)	0.255	-0.264			0.257	-0.274			0.240	-0.308		
	(0.162)	(0.242)			(0.170)	(0.249)			(0.174)	(0.255)		
household without piped sewage disposal (X)	0.160	-0.353			0.149	-0.332			0.156	-0.335		
	(0.153)	(0.212)*			(0.160)	(0.221)			(0.162)	(0.224)		
household without garbage collection (X)	0.160	0.237			0.099	0.260			0.105	0.260		
	(0.164)	(0.209)			(0.174)	(0.217)			(0.176)	(0.221)		

Table 3A (Contn'd): Parameter Estimates from Bivariate Probit Model, Boys, Market Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
# of children age 0-2 in HH									0.090	-0.035	-0.145	0.055
									(0.115)	(0.161)	(0.093)	(0.163)
# of children age 3-5 in HH									0.000	0.194	0.043	-0.052
									(0.101)	(0.142)	(0.084)	(0.157)
# of children age 6-9 in HH									-0.080	0.026	-0.030	0.186
									(0.084)	(0.120)	(0.074)	(0.130)
# of girls age 10-14 in HH									0.070	0.026	-0.045	0.019
									(0.095)	(0.127)	(0.076)	(0.127)
# of boys age 10-14 in HH									0.075	0.074	-0.108	0.177
									(0.091)	(0.118)	(0.079)	(0.120)
# of females age 15-17 in HH									0.138	-0.143	0.302	-0.529
									(0.101)	(0.162)	(0.109)**	(0.182)**
# of males age 15-17 in HH									0.139	-0.353	0.134	-0.132
									(0.115)	(0.177)**	(0.101)	(0.187)
# of females age 18-59 in HH									-0.061	-0.037	0.017	0.011
									(0.083)	(0.110)	(0.067)	(0.106)
# of males age 18-59 in HH									0.000	0.024	0.064	-0.090
									(0.069)	(0.089)	(0.067)	(0.094)
# of females age 60 and over in HH									0.098	-0.121	0.387	-0.147
									(0.176)	(0.254)	(0.170)**	(0.288)
# of males age 60 and over in HH									0.060	0.053	-0.004	-0.509
									(0.344)	(0.451)	(0.268)	(0.445)
Constant	-7.440	1.953	-1.439	1.030	-7.869	2.175	-1.729	1.323	-7.977	1.961	-1.226	1.088
	(1.350)**	(1.104)*	(0.711)**	(0.653)	(1.437)**	(1.152)*	(0.739)**	(0.684)*	(1.516)**	(1.229)	(0.796)	(0.807)
Correlation of errors (rho)	0.108				0.085				0.183			
Chi2-test (1) for rho=0	0.096				0.014				0.188			
p-value for Wald test of rho=0	0.757				0.909				0.664			
Log Likelihood	-1,394.45				-1,341.170				-1,317.108			
Log likelihood without regressors	-1835.60				-1835.60				-1835.602			
Number of observations	3455				3455				3455			

Robust standard errors in parentheses. (X) indicates that the variable is an instrument.

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

Table 3B: Parameter Estimates from Bivariate Probit Model, Girls, Inclusive Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
working			-2.388	0.167			-2.363	0.139			-2.457	0.198
			(0.127)**	(0.158)			(0.129)**	(0.161)			(0.118)**	(0.163)
age	0.325		0.604		0.333		0.621		0.338		0.652	
	(0.089)**		(0.095)**		(0.090)**		(0.096)**		(0.091)**		(0.097)**	
age squared/100	-0.326		-2.308		-0.361		-2.392		-0.355		-2.552	
	(0.409)		(0.448)**		(0.412)		(0.456)**		(0.417)		(0.455)**	
not son or daughter of household head	-0.208	0.451	0.135	0.388	-0.216	0.410	0.156	0.379	-0.305	0.536	0.089	0.286
	(0.118)*	(0.255)*	(0.154)	(0.251)	(0.120)*	(0.259)	(0.159)	(0.257)	(0.156)*	(0.290)*	(0.189)	(0.290)
time to school if walking, in minutes	-0.003	0.014	-0.004	0.008	-0.003	0.015	-0.004	0.008	-0.002	0.012	-0.004	0.009
	(0.006)	(0.011)	(0.007)	(0.011)	(0.006)	(0.011)	(0.007)	(0.011)	(0.006)	(0.011)	(0.007)	(0.011)
school is not in walking distance	-0.461	0.599	0.246	-0.181	-0.458	0.585	0.245	-0.151	-0.449	0.556	0.223	-0.137
	(0.200)**	(0.254)**	(0.282)	(0.319)	(0.201)**	(0.256)**	(0.286)	(0.325)	(0.203)**	(0.259)**	(0.290)	(0.329)
father's age when child was age 6	-0.009	0.006	-0.008	0.001	-0.008	0.003	-0.008	0.002	-0.005	0.005	-0.016	0.006
	(0.005)*	(0.010)	(0.006)	(0.010)	(0.005)	(0.010)	(0.006)	(0.010)	(0.006)	(0.012)	(0.007)**	(0.013)
difference between father's & mother's age	0.013	-0.003	0.017	-0.008	0.012	-0.002	0.017	-0.006	0.011	-0.003	0.024	-0.008
	(0.007)*	(0.015)	(0.009)*	(0.016)	(0.008)*	(0.015)	(0.009)*	(0.016)	(0.008)	(0.016)	(0.010)**	(0.017)
father's years of schooling	-0.027	-0.005	0.034	0.004	-0.024	-0.017	0.033	0.001	-0.026	-0.012	0.037	-0.003
	(0.008)**	(0.014)	(0.010)**	(0.016)	(0.008)**	(0.016)	(0.011)**	(0.018)	(0.008)**	(0.016)	(0.011)**	(0.018)
mother's years of schooling	-0.005	-0.025	0.056	-0.032	-0.005	-0.025	0.055	-0.031	-0.006	-0.024	0.056	-0.033
	(0.008)	(0.016)	(0.013)**	(0.022)	(0.008)	(0.016)	(0.013)**	(0.022)	(0.009)	(0.017)	(0.014)**	(0.023)
both parents absent	0.631	-0.769	-0.105	-0.204	0.619	-0.763	-0.109	-0.248	0.805	-0.579	-0.679	0.078
	(0.406)	(0.701)	(0.420)	(0.652)	(0.406)	(0.709)	(0.427)	(0.664)	(0.441)*	(0.790)	(0.490)	(0.753)
father absent permanently	-0.288	0.166	0.171	-0.321	-0.285	0.092	0.163	-0.328	-0.143	0.259	-0.184	-0.166
	(0.222)	(0.423)	(0.280)	(0.439)	(0.226)	(0.429)	(0.288)	(0.449)	(0.268)	(0.511)	(0.338)	(0.530)
father absent temporarily	-0.263	0.252	-0.323	0.310	-0.294	0.234	-0.309	0.350	-0.168	0.389	-0.578	0.407
	(0.230)	(0.469)	(0.286)	(0.514)	(0.232)	(0.473)	(0.290)	(0.522)	(0.259)	(0.529)	(0.324)*	(0.578)
mother absent (w/ or w/o stepmother present)	-0.102	0.810	-0.632	0.202	-0.118	0.817	-0.633	0.232	-0.078	0.812	-0.491	0.136
	(0.262)	(0.453)*	(0.250)**	(0.388)	(0.258)	(0.452)*	(0.251)**	(0.394)	(0.260)	(0.461)*	(0.261)*	(0.411)
father public sector worker when child was 6					-0.155	0.437	0.104	0.186	-0.161	0.426	0.077	0.237
					(0.102)	(0.210)**	(0.119)	(0.209)	(0.103)	(0.215)**	(0.120)	(0.213)
father regular private sector wage worker when child					-0.066	0.237	0.004	-0.046	-0.068	0.216	-0.002	0.031
					(0.106)	(0.223)	(0.120)	(0.218)	(0.107)	(0.230)	(0.122)	(0.224)
father nonwage workers when child was 6					-0.100	0.172	0.002	0.207	-0.100	0.125	0.041	0.206
					(0.112)	(0.225)	(0.132)	(0.224)	(0.113)	(0.230)	(0.134)	(0.230)
father not working or work data missing when child was					-0.109	0.148	0.059	0.106	-0.105	0.171	0.079	0.061
					(0.186)	(0.385)	(0.229)	(0.403)	(0.189)	(0.392)	(0.232)	(0.407)
farm enterprise					0.006	0.313	0.007	-0.214	0.015	0.284	0.024	-0.236
					(0.107)	(0.206)	(0.126)	(0.202)	(0.108)	(0.210)	(0.128)	(0.205)
non-farm entreprise					-0.153	0.115	0.187	0.004	-0.158	0.069	0.134	0.080
					(0.087)*	(0.162)	(0.121)	(0.189)	(0.087)*	(0.165)	(0.120)	(0.190)

Table 3B (Contn'd): Parameter Estimates from Bivariate Probit Model, Girls, Inclusive Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
HH in 2nd lowest urban wealth quintile	0.079	-0.185	0.245	-0.321	0.089	-0.176	0.257	-0.369	0.068	-0.194	0.231	-0.366
	(0.114)	(0.224)	(0.140)*	(0.223)	(0.114)	(0.226)	(0.142)*	(0.225)	(0.115)	(0.229)	(0.143)	(0.228)
HH in top three urban wealth quintiles	-0.249	-0.223	0.390	-0.300	-0.227	-0.212	0.381	-0.285	-0.232	-0.169	0.270	-0.228
	(0.110)**	(0.221)	(0.155)**	(0.235)	(0.111)**	(0.223)	(0.157)**	(0.241)	(0.112)**	(0.228)	(0.158)*	(0.244)
HH in 2nd lowest rural wealth quintile	-0.407	-0.407	0.091	0.011	-0.383	-0.517	0.077	0.064	-0.383	-0.574	0.088	0.122
	(0.154)**	(0.319)	(0.152)	(0.280)	(0.155)**	(0.329)	(0.154)	(0.286)	(0.156)**	(0.334)*	(0.156)	(0.294)
HH in top three rural wealth quintiles	-0.288	-0.298	0.360	0.023	-0.244	-0.458	0.331	0.022	-0.236	-0.476	0.350	0.072
	(0.138)**	(0.285)	(0.139)**	(0.236)	(0.141)*	(0.298)	(0.142)**	(0.247)	(0.142)*	(0.304)	(0.145)**	(0.256)
Alexandria and Suez Canal	-0.238	0.276	-0.114	0.208	-0.236	0.252	-0.103	0.209	-0.243	0.321	-0.173	0.209
	(0.127)*	(0.225)	(0.167)	(0.266)	(0.128)*	(0.225)	(0.170)	(0.272)	(0.128)*	(0.228)	(0.170)	(0.273)
Urban Lower Egypt	0.180	0.106	0.329	-0.058	0.220	0.020	0.333	-0.021	0.220	0.084	0.360	-0.079
	(0.122)	(0.227)	(0.158)**	(0.249)	(0.123)*	(0.229)	(0.160)**	(0.254)	(0.123)*	(0.232)	(0.162)**	(0.257)
Urban Upper Egypt	0.267	-0.078	0.541	-0.118	0.281	-0.105	0.568	-0.096	0.274	-0.103	0.577	-0.151
	(0.122)**	(0.228)	(0.168)**	(0.260)	(0.122)**	(0.228)	(0.171)**	(0.265)	(0.124)**	(0.232)	(0.175)**	(0.270)
Rural Lower Egypt	0.515	0.021	0.458	-0.347	0.502	0.115	0.516	-0.294	0.487	0.193	0.441	-0.374
	(0.195)**	(0.390)	(0.210)**	(0.344)	(0.197)**	(0.402)	(0.215)**	(0.354)	(0.197)**	(0.408)	(0.220)**	(0.364)
Rural Upper Egypt	0.661	-0.356	0.307	-0.325	0.646	-0.300	0.351	-0.279	0.626	-0.155	0.321	-0.372
	(0.196)**	(0.397)	(0.218)	(0.367)	(0.197)**	(0.406)	(0.222)	(0.375)	(0.199)**	(0.413)	(0.228)	(0.387)
% female w/ secondary school or above	0.041	-0.047	0.037	-0.024	0.041	-0.040	0.037	-0.029	0.041	-0.034	0.036	-0.030
	(0.011)**	(0.020)**	(0.011)**	(0.019)	(0.011)**	(0.021)*	(0.011)**	(0.020)	(0.011)**	(0.021)	(0.012)**	(0.020)
% male w/ secondary school or above	-0.031	0.046	-0.025	0.031	-0.032	0.040	-0.024	0.035	-0.031	0.033	-0.027	0.036
	(0.012)**	(0.022)**	(0.011)**	(0.018)*	(0.012)**	(0.023)*	(0.011)**	(0.018)*	(0.012)**	(0.023)	(0.011)**	(0.019)*
% agricultural workers in locality (X)	0.011	-0.001			0.010	-0.025			0.011	-0.033		
	(0.008)	(0.048)			(0.008)	(0.050)			(0.008)	(0.050)		
% service & trade workers in locality (X)	0.013	0.004			0.021	0.005			0.017	-0.002		
	(0.024)	(0.016)			(0.025)	(0.016)			(0.025)	(0.016)		
% craft workers in locality (X)	0.028	0.021			0.028	0.021			0.031	0.010		
	(0.015)*	(0.028)			(0.015)*	(0.029)			(0.015)**	(0.029)		
households without piped water (X)	0.493	-0.713			0.476	-0.687			0.431	-0.608		
	(0.100)**	(0.199)**			(0.102)**	(0.206)**			(0.101)**	(0.208)**		
households without piped sewage disposal (X)	0.161	0.021			0.153	-0.010			0.154	0.014		
	(0.077)**	(0.133)			(0.078)*	(0.135)			(0.078)**	(0.137)		
households without garbage collection (X)	0.128	0.051			0.130	0.044			0.119	0.024		
	(0.072)*	(0.141)			(0.073)*	(0.143)			(0.073)	(0.145)		

Table 3B (Contn'd): Parameter Estimates from Bivariate Probit Model, Girls, Inclusive Work Definition

	Model 1				Model 2				Model 3			
	work		school		work		school		work		school	
Variables	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17	age 6-14	increment for age 15-17
# of children age 0-2 in HH									0.052	-0.064	-0.200	-0.050
									(0.061)	(0.137)	(0.073)**	(0.140)
# of children age 3-5 in HH									0.029	-0.082	-0.023	0.070
									(0.049)	(0.114)	(0.059)	(0.116)
# of children age 6-9 in HH									-0.046	0.025	-0.193	0.077
									(0.046)	(0.094)	(0.055)**	(0.097)
# of girls age 10-14 in HH									0.025	0.195	-0.150	0.079
									(0.048)	(0.090)**	(0.059)**	(0.098)
# of boys age 10-14 in HH									0.102	0.060	0.057	-0.108
									(0.048)**	(0.090)	(0.061)	(0.098)
# of females age 15-17 in HH									0.009	0.096	-0.053	0.269
									(0.056)	(0.129)	(0.069)	(0.134)**
# of males age 15-17 in HH									-0.085	0.254	-0.040	0.025
									(0.061)	(0.137)*	(0.075)	(0.138)
# of females age 18-59 in HH									-0.052	-0.153	0.088	-0.006
									(0.045)	(0.083)*	(0.058)	(0.091)
# of males age 18-59 in HH									0.003	0.173	0.021	-0.023
									(0.041)	(0.075)**	(0.049)	(0.075)
# of females age 60 and over in HH									-0.087	0.164	0.277	-0.151
									(0.090)	(0.189)	(0.116)**	(0.204)
# of males age 60 and over in HH									0.260	-0.012	-0.044	0.545
									(0.159)	(0.349)	(0.194)	(0.361)
Constant	-3.732	-0.812	-2.228	-0.211	-3.693	-0.814	-2.390	-0.365	-3.914	-1.094	-1.903	-0.819
	(0.674)**	(0.914)	(0.591)**	(0.523)	(0.684)**	(0.947)	(0.605)**	(0.546)	(0.714)**	(1.021)	(0.640)**	(0.655)
Correlation of errors (rho)	0.834				0.818				0.852			
Chi2-test (1) for rho=0	28.720				26.811				32.654			
p-value for Wald test of rho=0	0.000				0.000				0.000			
Log Likelihood	-2,523.85				-2504.20				-2449.360			
Log likelihood without regressors	-3,422.682				-3,422.682				-3,422.682			
Number of observations	3307				3307				3307			

Robust standard errors in parentheses. (X) indicates that the variable is an instrument.
*** significant at 1%,** significant at 5%; *significant at 10%

Table 4: Marginal Effects on the Marginal and Joint Probabilities of Work and School Based on Model (1), Reference Boy using Market Work Definition, and Reference Girl using Inclusive Work Definition

In School (S=1) or not in school (S=0) Working (W=1) or not working (W=0)	Reference Boy, Market Work						Reference Girl, Inclusive Work					
	W=1	S=1	S=1 & W=0	S=1 & W=1	S=0 & W=1	S=0 & W=0	W=1	S=1	S=1 & W=0	S=1 & W=1	S=0 & W=1	S=0 & W=0
Probability for reference individual	0.042	0.887	0.874	0.013	0.029	0.085	0.505	0.807	0.475	0.332	0.173	0.020
Change in probability due to unit change in :												
age	0.030	0.058	0.042	0.016	0.015	-0.073	0.130	0.093	-0.101	0.194	-0.065	-0.029
age squared/100	-0.024	-0.374	-0.333	-0.041	0.017	0.357	-0.130	-0.624	0.020	-0.644	0.514	0.110
not son or daughter of household head	0.017	-0.002	-0.008	0.006	0.011	-0.009	-0.082	0.088	0.088	0.000	-0.082	-0.006
time to school if walking, in minutes	0.000	-0.001	-0.001	0.000	0.000	0.000	-0.001	0.000	0.001	-0.001	0.000	0.000
school is not in walking distance	-0.007	0.078	0.071	0.007	-0.014	-0.064	-0.178	0.146	0.187	-0.041	-0.137	-0.009
father's age when age 6	0.001	-0.001	-0.001	0.000	0.001	0.000	-0.003	0.000	0.003	-0.003	-0.001	0.000
difference between father's & mother's age	-0.002	0.003	0.003	0.000	-0.001	-0.001	0.005	0.002	-0.004	0.006	-0.001	-0.001
father's years of schooling	-0.003	0.007	0.007	0.000	-0.002	-0.004	-0.011	0.018	0.012	0.006	-0.017	-0.002
mother's years of schooling	-0.003	0.009	0.009	0.000	-0.003	-0.007	-0.002	0.019	0.005	0.014	-0.016	-0.003
both parents absent	-0.025	0.022	0.029	-0.007	-0.018	-0.004	0.235	-0.243	-0.240	-0.002	0.237	0.005
father absent permanently	0.108	-0.098	-0.121	0.023	0.084	0.014	-0.114	0.111	0.121	-0.010	-0.104	-0.007
father absent temporarily	0.013	0.033	0.023	0.010	0.004	-0.036	-0.104	-0.022	0.082	-0.105	0.001	0.022
mother absent (w/ or w/o stepmother)	0.050	-0.241	-0.236	-0.005	0.054	0.186	-0.041	-0.185	-0.016	-0.169	0.128	0.057
HH in 2nd lowest urban quintile	0.009	0.058	0.046	0.013	-0.003	-0.055	0.032	0.050	-0.023	0.073	-0.041	-0.009
HH in top three urban quintiles	-0.034	0.082	0.090	-0.009	-0.025	-0.057	-0.099	0.141	0.111	0.030	-0.128	-0.013
HH in 2nd lowest rural quintile	0.039	-0.047	-0.055	0.008	0.031	0.017	-0.158	0.116	0.162	-0.047	-0.112	-0.004
HH in top three rural quintiles	-0.006	0.068	0.062	0.006	-0.011	-0.057	-0.114	0.141	0.125	0.016	-0.130	-0.012
Alexandria and Suez Canal	-0.016	0.020	0.024	-0.004	-0.012	-0.008	-0.094	0.033	0.088	-0.055	-0.039	0.006
Urban Lower Egypt	0.031	0.008	-0.005	0.014	0.017	-0.026	0.071	0.049	-0.060	0.109	-0.038	-0.011
Urban Upper Egypt	0.065	-0.031	-0.052	0.021	0.044	-0.013	0.105	0.085	-0.090	0.175	-0.070	-0.015
Rural Lower Egypt	0.001	0.039	0.034	0.005	-0.004	-0.035	0.196	0.005	-0.182	0.188	0.009	-0.014
Rural Upper Egypt	0.055	-0.073	-0.082	0.010	0.045	0.027	0.245	-0.086	-0.234	0.148	0.097	-0.011
% female w/ secondary school or above	0.003	-0.010	-0.011	0.000	0.003	0.007	0.016	0.000	-0.015	0.014	0.002	-0.002
% male w/ secondary school or above	-0.002	0.009	0.009	0.000	-0.002	-0.007	-0.013	0.001	0.011	-0.010	-0.003	0.001
% agricultural workers in locality	0.002	-0.002	-0.002	0.001	0.002	0.000	0.004	-0.003	-0.004	0.001	0.003	0.000
% service & trade workers in locality	0.014	-0.009	-0.013	0.004	0.010	-0.001	0.005	-0.004	-0.005	0.001	0.004	0.000
% craft workers in locality	0.004	-0.003	-0.004	0.001	0.003	0.000	0.011	-0.008	-0.011	0.003	0.008	0.000
household without piped water	0.028	-0.018	-0.026	0.008	0.020	-0.002	0.188	-0.156	-0.188	0.032	0.156	0.000
household without piped sewage disposal	0.016	-0.011	-0.015	0.005	0.012	-0.001	0.064	-0.049	-0.064	0.015	0.049	0.000
household without garbage disposal	0.016	-0.011	-0.015	0.005	0.012	-0.001	0.051	-0.039	-0.051	0.012	0.039	0.000
currently working		-0.679	-0.653	-0.026	0.026	0.653		-0.609	-0.436	-0.173	0.173	0.436

*Based on marginal change for continuous variables and change from 0 to 1 for dummy variables

^The reference individual is a 14 year old boy or girl whose father and mother are present and have mean years of schooling. He or she lives in Greater Cairo and belongs to a household in the lowest urban wealth quintile that has no household enterprise. S/he lives in a neighborhood with the mean proportion of agricultural, service and trade, and craft workers, and the mean proportion of males/females with secondary education and above.

Table 5: Simulation of Effect of Work on Schooling, Boys (Market Work) and Girls (Inclusive Work)

		Specification of Schooling Variable					
		Currently in school or not		Ever in school or not		Currently in school or not, conditional on having been in school	
		Boys	Girls	Boys	Girls	Boys	Girls
Reference child*							
Model 1	Pr[S=1|W=0]	0.913	0.975	0.992	0.995	0.941	0.960
	Pr[S=1|W=1]	0.234	0.331	0.380	0.566	0.363	0.483
	Abs Change due to work	(-0.679)	(-0.643)	(-0.612)	(-0.429)	(-0.579)	(-0.477)
	Rel Chg due to work	-74%	-66%	-62%	-43%	-61%	-50%
Model 2	Pr[S=1|W=0]	0.870	0.968	0.990	0.993	0.941	0.947
	Pr[S=1|W=1]	0.102	0.304	0.184	0.535	0.068	0.451
	Abs Change due to work	(-0.768)	(-0.664)	(-0.806)	(-0.458)	(-0.874)	(-0.496)
	Rel Chg due to work	-88%	-69%	-81%	-46%	-93%	-52%
Model 3	Pr[S=1|W=0]	0.851	0.985	0.985	0.997	0.939	0.986
	Pr[S=1|W=1]	0.069	0.388	0.154	0.605	0.019	0.578
	Abs Change due to work	(-0.782)	(-0.597)	(-0.831)	(-0.392)	(-0.920)	(-0.408)
	Rel Chg due to work	-92%	-61%	-84%	-39%	-98%	-41%
Most vulnerable child**							
Model 1	Pr[S=1|W=0]	0.786	0.963	0.951	0.985	0.898	0.990
	Pr[S=1|W=1]	0.098	0.274	0.145	0.393	0.155	0.710
	Abs Change due to work	(-0.688)	(-0.689)	(-0.805)	(-0.592)	(-0.743)	(-0.280)
	Rel Chg due to work	-88%	-72%	-85%	-60%	-83%	-28%
Model 2	Pr[S=1|W=0]	0.742	0.959	0.948	0.981	0.896	0.988
	Pr[S=1|W=1]	0.040	0.266	0.055	0.382	0.036	0.697
	Abs Change due to work	(-0.702)	(-0.693)	(-0.893)	(-0.600)	(-0.860)	(-0.291)
	Rel Chg due to work	-95%	-72%	-94%	-61%	-96%	-29%
Model 3	Pr[S=1|W=0]	0.725	0.977	0.934	0.989	0.875	0.997
	Pr[S=1|W=1]	0.027	0.325	0.047	0.423	0.007	0.789
	Abs Change due to work	(-0.698)	(-0.652)	(-0.887)	(-0.566)	(-0.868)	(-0.208)
	Rel Chg due to work	-96%	-67%	-95%	-57%	-99%	-21%
Least vulnerable child***							
Model 1	Pr[S=1|W=0]	0.988	0.997	0.999	1.000	0.995	0.998
	Pr[S=1|W=1]	0.572	0.653	0.638	0.820	0.626	0.855
	Abs Change due to work	(-0.416)	(-0.345)	(-0.361)	(-0.180)	(-0.369)	(-0.142)
	Rel Chg due to work	-42%	-35%	-36%	-18%	-37%	-14%
Model 2	Pr[S=1|W=0]	0.976	0.996	0.999	0.999	0.994	0.996
	Pr[S=1|W=1]	0.336	0.617	0.400	0.795	0.301	0.828
	Abs Change due to work	(-0.640)	(-0.379)	(-0.599)	(-0.204)	(-0.874)	(-0.168)
	Rel Chg due to work	-66%	-38%	-60%	-20%	-93%	-17%
Model 3	Pr[S=1|W=0]	0.974	0.998	0.998	1.000	0.994	0.999
	Pr[S=1|W=1]	0.282	0.670	0.355	0.823	0.137	0.867
	Abs Change due to work	(-0.693)	(-0.328)	(-0.642)	(-0.176)	(-0.857)	(-0.132)
	Rel Chg due to work	-71%	-33%	-64%	-18%	-86%	-13%

* The reference child is 14 years old, has both parents living at home and have the mean years of schooling. S/he lives in Greater Cairo and belongs to a household in the lowest urban wealth quintile that has no household enterprise and is connected to the water and sewer networks and has garbage collection service. S/he lives in a neighborhood with the mean proportion of service and trade, agricultural, and craft workers, and the mean proportion of males/females with secondary education and above. In addition, in Model 2, her father is an irregular private sector worker and in model 3, she is in a household that has no other members besides her parents.

** The most vulnerable child is similar to the reference child but has parents with no schooling, and, in Model 3 s/he lives in a household with one child under 2, another between 6 and 9, and a sister age 10-14.

*** The least vulnerable child is similar to the reference child except for the following: s/he lives in a household in the top 3 urban wealth quintiles, his/her father has 12 years of schooling and his/her mother has 9 years of schooling, and his/her father is a public sector worker in Models 2 and 3.

Table A1. Scoring Coefficients and Summary Statistics for Variables Entering the Computation of the First Factor

	urban households			rural households		
	scoring coefficients	Mean	SD	scoring coefficients	Mean	SD
number of rooms in dwelling	0.056	3.584	1.151	0.033	4.048	1.778
quality of wall materials	0.020	0.803	0.398	0.037	0.594	0.491
quality of floor materials	0.064	0.94	0.237	0.084	0.576	0.494
quality of roof materials	0.065	0.892	0.31	0.073	0.506	0.5
own a phone	0.117	0.484	0.5	0.090	0.149	0.357
own a fridge	0.127	0.875	0.331	0.187	0.46	0.499
own a stand alone freezer	0.039	0.074	0.262	0.027	0.012	0.111
own a dishwasher	0.017	0.026	0.158	0.015	0.005	0.071
own a color TV	0.161	0.758	0.429	0.148	0.329	0.47
own a black and white TV	-0.049	0.275	0.446	-0.031	0.521	0.5
own a VCR	0.066	0.209	0.407	0.046	0.03	0.17
own an air-conditioner	0.035	0.054	0.225	0.019	0.005	0.073
own a microwave	0.009	0.017	0.129	0.012	0.011	0.106
own a gas stove	0.089	0.852	0.355	0.122	0.557	0.497
own a kerosene stove	-0.062	0.437	0.496	-0.049	0.724	0.447
own an electrical fan	0.091	0.773	0.419	0.105	0.496	0.5
own a water heater	0.153	0.538	0.499	0.105	0.102	0.303
own a space heater	0.044	0.099	0.299	0.032	0.022	0.147
own a sewing machine	0.038	0.229	0.42	0.037	0.097	0.295
own an iron	0.130	0.792	0.406	0.162	0.461	0.499
own a radio	0.065	0.832	0.374	0.059	0.689	0.463
own a washing machine	0.078	0.925	0.264	0.109	0.687	0.464
own a camera	0.055	0.162	0.369	0.048	0.047	0.212
own a bicycle	0.021	0.18	0.384	0.026	0.188	0.391
own a motorcycle or scooter	0.006	0.015	0.122	0.020	0.018	0.135
own an automobile	0.050	0.108	0.31	0.036	0.019	0.137
own a taxicab	0.006	0.01	0.101	0.007	0.008	0.089
own a truck	0.008	0.011	0.104	0.013	0.006	0.076
Asset Index		0	0.941		0	0.937

Notes: All variables except for number of rooms take on a value of zero and one. Number of rooms ranges from 1 to 12 in urban areas and 1 to 20 in rural areas.
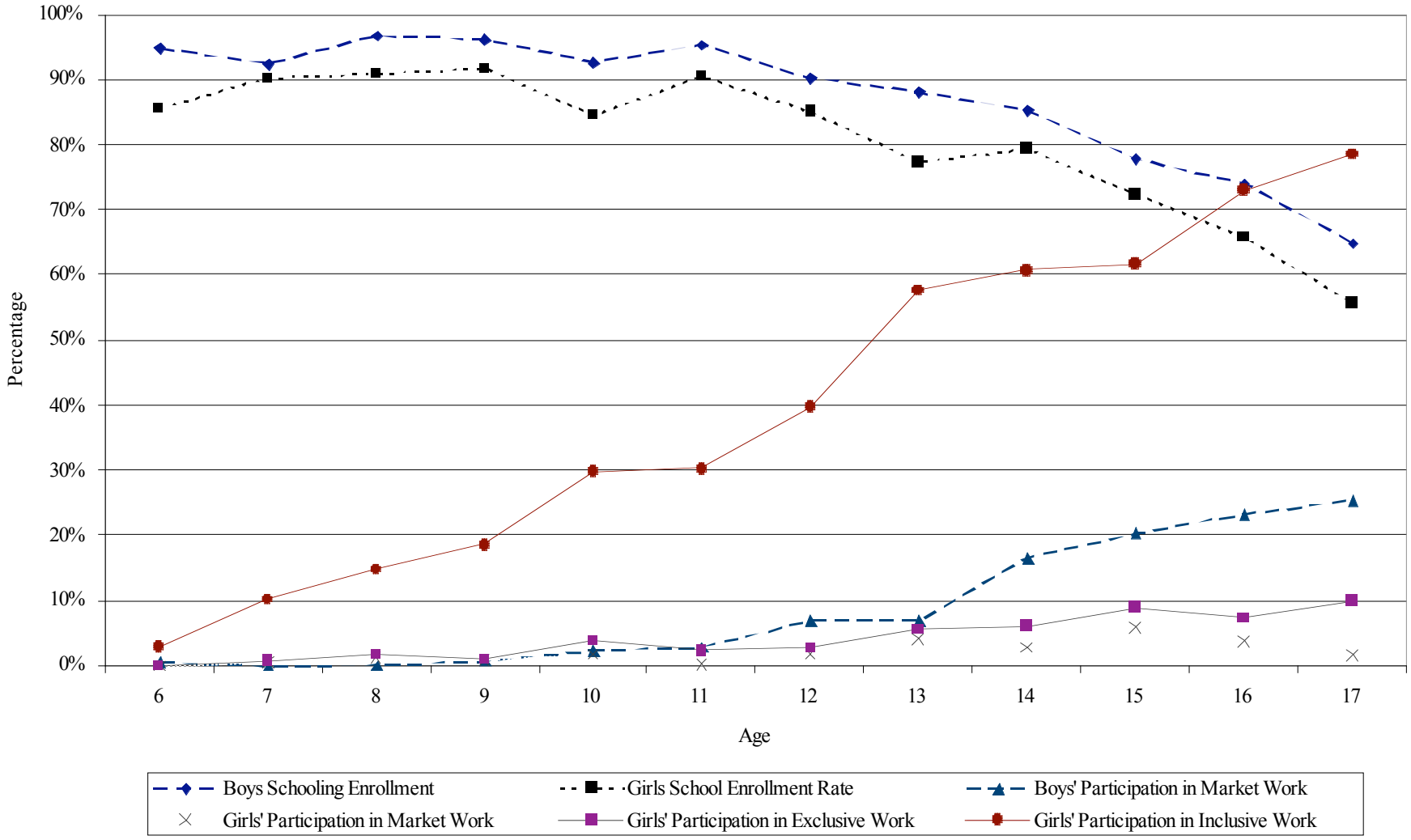
Figure 1: School Enrollment and Work Participation by Age and Sex