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Working Paper 0111

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Abstract

The main objective of this paper is to determine the causal relationship between child work and school enrollment in Egypt while taking into account the simultaneous nature of family (or child) decisions regarding school and work activities. We also assess how a broader definition of work, including domestic work, affects conclusions about the impact of work on schooling for girls. Finally, we examine how children's vulnerability to work and lack of schooling relates to characteristics of their parents and households. We show that child work does not reduce the probability of schooling for boys, but that it does for girls, using either a traditional or broader definition of work. Although policy measures that succeeded in reducing girls' work would increase enrollment, it is hard to formulate such measures since most girls work within the confines of their own homes.

I. Introduction

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. From 1988 to 1998, school enrollment of 6-14 year olds jumped from 81 to 89 percent, while their involvement in market and subsistence labor force activities fell from 18.5 to 7.1 percent. Still, in 1998 approximately 1.4 million children ages 6-14 (11 %) did not attend school, and approximately 860 thousand children (7.1 %) regularly engaged in labor force work, while 2.2 million girls (34.6 %) spent time on household chores and uncounted numbers engaged in child care.

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. 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 activities that children engage in 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. 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[1]. Thus, the essential question we seek to explore is: when does children's work, broadly defined, put Egyptian children at risk of not benefiting from education to the extent possible.

Higher school enrollment and improved school attainment has been repeatedly shown to be one of the most effective ways to reduce poverty. 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[2]. 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 stamp out 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.[3] 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,

[1] 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.

[2] We use the terms "child work" and "child labor" interchangeably. In our usage, neither has a pejorative sense, per se.

[3] Examples include DeGraff, Bilsborrow, and Herrin (1993) for the Philippines; Jensen and Nielsen (1997) for Zambia; Canagarajah and Coulombe (1998) for Ghana; Knaul (1999, 1995) 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; and Skoufias (1994) for India.

or neither[4]. One of the problems of this approach is the assumption of independence of irrelevant alternatives. Others have used ordered probit models[5]. The fundamental problem with such models is that they must assume that 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 additional 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[6].

Girls' domestic labor 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 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 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 of labor force statistics, they may result in biases when trying to understand the phenomena of child labor and schooling (Levison 2000).

Finally, many studies have explicitly examined the causal relationship between the socioeconomic status of household and child labor and schooling, but the great majority is 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) examines 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.

This paper has three main objectives. First, it attempts the difficult task of determining the causal relationship between child work and school enrollment in Egypt. Second, it assesses how the definition of work affects our conclusions about its impact. Specifically, we use a definition that considers children to be at work only if they work a significant number of hours per week and we include domestic work in our definition of work. This is particularly relevant for girls whose involvement in domestic work is extensive and undocumented in standard labor force statistics. Third, it attempts to relate children's vulnerability to work, and the lack of schooling to the characteristics of their parents and their households.

Admittedly, child work could have implications for schooling beyond determining school enrollment. 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 upon 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. A framework for the analysis, variables used, and estimation

[4] Examples include Levison et al. (2001) and various chapters in Grootaert and Patrinos (1999).

[5] 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.

[6] Ridao-Cano (2001) uses a similar approach to ours to determine the effect of working while in school on the probability of progressing to secondary school in rural Bangladesh.

methods are described in section IV on methodology. Estimation results follow in section V, followed by a conclusion (section VI).

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. 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). 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 the 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. We take advantage of this information only to the extent that we control for the existence of family enterprises.

Although the survey instrument required that the individual him or herself respond to the questions, an exception was made for children under 15. Thus for the group under consideration here, adults in the households were allowed to respond on behalf of their children, and 80 percent of the parents of the children in our sample opted to do so. The fact that we know who responded to the individual-specific questions allows us to check whether the proportion of children observed working differs significantly according to the identity of the respondent. Two-way cross tabulations reveal that there is no significant difference in activity rates between boys who responded for themselves and those for whom someone else responded. For girls there is a significant difference, but only when the broad definition of activity that includes domestic work is used. While 37 percent of girls responding for themselves declared themselves to be engaged in such work, only 29 percent of those for whom someone else responded were reported to be active in this way. The fact that there is no significant difference for the narrower definition – which includes market and subsistence work only – shows that parents are more likely to under-report domestic work compared to other kinds of work.

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. Due to the presence of missing data on some variables our final sample includes 4,963 children, of whom 2,526 are boys and 2,437 are girls.

We make passing use of a special round of the Egyptian Labor Force Sample Survey conducted in October 1988 (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. The ELMS 1998 was designed to be as comparable as possible to the LFSS 1988.

III. Work and School in the Egyptian Context

Primary education. There are currently six years of primary education in Egypt. For a period of nine years, from 1990 to 1999, these were reduced to 5 years of primary school to allow for the absorption of a larger number of children in the school system[7]. Since most of the children in our sample would have been in primary school during this period, they would have had only 5 years of primary schooling. Primary schooling is followed by three years of preparatory education. Mandatory basic education was limited to the primary stage but was extended to the preparatory stage in 1991. However, the law mandating schooling up to the preparatory stage is not strictly enforced. 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.

According to the ELMS-1998, most enrolled children 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

[7] The sixth year will be phased back in starting with the children who entered the first grade in 2000.

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.

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 ELFS-1998, we see that rural girls – the group with the lowest enrollment rates – benefited disproportionately. In 1988, 62 percent of rural girls 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.

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 that year to bring it into line with the age of mandatory schooling. Despite these laws, a significant proportion of children continue to work. Since there is a great deal of controversy over what constitutes work for children and which definition of work should be used to describe children's activities, we apply several alternative definitions. In particular we strive to use definitions that avoid significant gender bias in the way work is defined.

Inclusive work. In the broadest definition of work that we use, which we refer to as "inclusive," we define domestic chores performed by women and female children at home as work. Although this sort of work is not considered employment according to international definitions of economic activity, it can interfere with a child's school attendance and performance and is therefore important to examine[8]. Chores that are considered work in this definition include cooking, errands, house cleaning, collecting water, laundry, and childcare. We suspect, however, that some chores, such as childcare, are underreported. 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.

Girls (or their parents) were asked to report their first-, second-, and third-most-time-consuming domestic chores. Errands, household chores and cooking were frequently reported as the first- and second-most-time-consuming tasks; one of them was chosen as first choice for 86.5 percent of the girls, and one of them was the second choice for 97 percent of the girls. Doing the laundry was at the top of the list for third-most-time-consuming task. Fetching water and childcare were chosen by fewer than 10 percent of respondents in each case. Since childcare is frequently undertaken jointly with another, often more focused, activity, it is undoubtedly underreported (Reynolds 1991).

Exclusive work. In a second definition, which we refer to as "exclusive," we rely on the standard international definition of economic activity, including market work. This includes work undertaken for the purpose of market exchange, as well as subsistence work in the primary sectors, most notably agriculture and animal husbandry.

Market work. Finally, the narrowest definition, which we call "market," restricts the definition of work to market work only. Market work includes substantially fewer girls than does exclusive work – only 96 thousand, compared to almost 170 thousand doing market plus subsistence (i.e. "exclusive") work. In contrast, 287 thousand boys in Egypt are engaged in market work; this increases only to 290.2 thousand when subsistence work is also counted.

It turns out that which definitions are used makes virtually no difference for boys but makes a big difference for girls[9]. Accordingly, in our subsequent analysis, we stick to the market definition for boys and use alternative definitions 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 one hour per week as employed. Since our interest is in detecting the kind of work that can potentially interfere

[8] See the International Labor Organization's web site at http:/www.ilo.org/public/english/120stat/res/ecacopo.htm for the international definition of economic activity.

[9] For boys, the rate of participation increases slightly from 4.68 to 4.81 percent as we move from the market to the exclusive definition, using the 1-hour per week cutoff. For girls it goes from 1.7 to 8.18 to 42.77 percent as we move from market to exclusive to inclusive.

with a child's schooling, we use a higher hours cut-off of 14 hours per week to identify a working child[10]. 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. She is considered to be working according to the exclusive definition if she spends 14 or more hours per week in either market or subsistence work [11].

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 three months or one year (three months in the ELMS 1998). In the results we present below, we opted to use the more inclusive long reference period, which includes the months of August, September and October, 1998, even though it may include some summer work. It turns out that the change in reference period makes very little difference for girls although it makes some difference for boys[12].

Child activities. Table 1 provides the means and standard deviations for our dependent variables, weighted by the appropriate sampling weights. First we note that about half as many boys as girls are out of school. In contrast, more than twice as many boys as girls are engaged in market work. Once subsistence and domestic activities are included, however, girls' activity rates rise significantly. The most striking feature in these statistics is the extent to which official definitions of work, whether using the market or exclusive definitions, understate the work of girls. When work is broadly defined to include domestic work, nearly one third of girls work for at least 14 hours per week.

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 subsistence work and, to a lesser extent, for the measurement of domestic work.

Since our primary concern is to study how schooling and work interact, we present the cross-classification of the schooling and work variables for the various definitions of work using the 14-hour per week cutoff that we will be using throughout the rest of this paper. A substantial proportion of the boys who work (36%) combine work and school (Table 1). In contrast, very few girls, who engage in either market or subsistence work, manage to combine work with school. Domestic work, on the other hand, appears to be compatible with schooling for girls. According to either the market or exclusive definitions of work, about 12 percent of girls are found to be neither in school nor working. When the inclusive definition of work is used, however, this proportion 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 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 15.0 and 19.4 mean weekly hours of exclusive and inclusive work, respectively, while excluding them raises the same means to 39.6 and 25.5 weekly hours. Although children 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 8.3 hours according to the exclusive definition and nearly 16 hours according to the inclusive definition of work.

Child market workers. Because the type of work we call "market" work was the focus of the ELMS 1998, a series of questions in the survey investigates the characteristics of such work, allowing us to describe child market workers in more detail than those who are only captured under the exclusive or inclusive work definitions. We observe 139 children doing at least 14 hours per week of market work in ELMS-1998, representing 394.7

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

[11] 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. These two states are therefore mutually exclusive in our data.

[12] According to the exclusive definition of work with a one-hour cutoff, girls participation increases from 8.15 to 8.18 percent when we move from a one-week reference period to a 3 month reference period, whereas boys' participation goes from 3.68 to 4.81 percent.

thousand 6-14 year olds throughout Egypt. Only four percent are under age 9, and another 11 percent are ages 9 and 10. As is typical of child market work, participation increases with age: 6, 18, 25, and 36 percent of the sample of market workers are ages 11, 12, 13, and 14, respectively.

For most child market workers, the ELMS-1998 includes information on who decided that the child should first enter the labor market and the reason why the child began working then. Fathers decided for 61 percent of boys and 63 percent of girls, while mothers decided for almost 11 percent of boys, but only 6 percent of girls. Siblings decided for only 2 percent of boys, but for over 10 percent of girls. It is interesting that over 25 percent of boys and 21 percent of girls are reported to have decided themselves to enter market work. Girls entered market work primarily due to a need for money (54.0%) and for "family reasons" (31.3%); others started market work to help in a family business (5.4%), because of failing in school (4.7%), or to learn a trade or skill (4.4%). Boys mainly entered market work because of "family reasons" (37.0%), needing money (21.1%), and failing in school (22.6%); others began to learn a trade or skill (12.6%), to help in a family business (1.2 percent) or for other unspecified reasons (5.7%). Although these reasons are suspect, since they may be after-the-fact rationalizations by parents and/or the child, the gender differences are interesting. In particular, failing in school is mentioned much less frequently for girls than for boys, while the need for money figures more prominently for girls. These results are in line with our later finding that work affects school enrollment more significantly for girls than for boys.

Location of market work. Children engage in market work in a variety of workplaces. The majority – 54 percent of boys and 60 percent of girls – works in fields and on farms. The next largest group, including 16 percent of boys and 14 percent of girls, is found in workshops and factories. Another 16 percent of boys and 5 percent of girls are mobile workers (not including street vendors). Almost 10 percent of boys work in stores, but only 4 percent of girls do so. Only 1.7 percent of child market workers are described as working at home (2.2% of boys but 0% of girls).

Employment status and skill. Among children engaged in market work, 45.6 percent (46% of boys and 44% of girls) are unpaid family workers and the rest are wageworkers. Such a high percentage of unpaid family workers – greater than in many other countries – implies that young market workers may be especially hard to target in Egypt. When subsistence work is added to market work, boys are hardly affected but the percentage of girls doing unpaid family work increases to 69.4 percent.

Boys' market work is more likely than that of girls' to require some level of skill (26% and 9%, respectively). Skills are generally acquired through apprenticeships: 65.1 thousand Egyptian boys, but only 9.2 thousand girls are either apprentices or assistants in skilled craft occupations.

Stability of market work. Most quantitative data tells researchers very little about the intensity of child work. Generally the only dimension of intensity measured in labor market surveys is weekly hours worked. The ELMS-1998 captures another dimension of intensity via a question on the stability of "market" employment. Work is classified as either regular or irregular based on whether it is continuous or intermittent. Regular work is further subdivided into permanent or temporary work and irregular work is further subdivided into seasonal or casual depending on whether it is carried out in a particular time of year or simply intermittent throughout the year.

Table 2 implies that there is substantial sex-typing of work even within unpaid family work: all of girls' unpaid family work is considered "permanent," while only half of boys' unpaid work is permanent and more than a quarter of it is seasonal. Because of this difference, three-quarters of girls engaged in market work are in very stable positions, but almost half of boys' market work is temporary, seasonal, or casual.

Conditions of wage employment. According to the ELMS-1998 survey, there are approximately 215 thousand child wageworkers in Egypt, of whom 159 thousand are boys. Forty-two percent of child wageworkers are employed in establishments, many of them quite small, and the rest have no fixed location of work. Among wageworkers in establishments, 74 percent of boys and 19 percent of girls are in establishments with 4 or fewer employees; another 26 and 19 percent, respectively, are in establishments with 5 to 9 employees. Girls employed in establishments are more likely than boys to be in larger establishments, with half of such girls in enterprises of 10 or more employees.

Few child wageworkers are employed by members of their own household, but 16 percent of both boys and girls who work for wages work for

relatives, and another 8 percent of boys and 16 percent of girls are employed by neighbors or friends of the family. An additional 33 percent of boys and 24 percent of girls work for employers who hail from the same village of origin, leaving 41 and 44 percent of boys and girls, respectively, in the employment of employers not related to them in any way.

Industries and occupations. Children working outside the home are concentrated in relatively few industries, as shown in Table 3. The majority works in agriculture. In addition, girls work in food preparation, the textile and garment industries, retail trade, and miscellaneous personal services. Boys work in all of those industries (except textiles) and in restaurants, and they learn trades in the furniture, wood manufacturing, metal manufacturing, construction, and repair industries. A slightly different understanding of children's work can be obtained by tabulating girls' and boys' occupations. Girls doing market work are found in only six occupations: agricultural workers (64.4%), salesperson (7.3%), textiles (7.4%), food preparation (7.0%), maintenance workers/building cleaners (6.4%), and tailors (2.1%). Considering the exclusive definition of work, girls are found in the same occupations but the proportion in agricultural work increases to 81.3 percent because of the addition of more girls who take care of livestock. Boys are observed in a bigger range of occupations. While almost two-thirds are agricultural workers (63.9%), the remaining third are found in 18 other occupations, including sales and ambulatory sales (7.4%), a variety of trades (23.3%), and other occupations (6.3%, including photographer, waiter, hair cutter, baker, and tailor). Boys in the trades are identified as carpenters, metal workers, auto body workers, house painters, basket makers, masons, and workers in equipment assembly and repair, auto repair, electrical repair, construction and electrification, plumbing, and reinforced concrete. Many of these boys are apprentices. None of the occupations described here are among those targeted for elimination of child labor under the International Labor Organization's Convention 182 on the worst forms of child labor (adopted in June 1999 and ratified by 100 countries by September 2001). While some child workers in Egypt are undoubtedly engaged in some of the "worst forms," such as sex work, we cannot identify them. Nor can we identify especially abusive conditions of employment, which may exist in any workplace.

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 attending school during the reference week. The other dependent variable indicates whether or not the child is engaged in work for at least 14 hours per week in the three-months reference period. For boys, which of the three definitions of work to use is immaterial since they all produce highly similar estimates and basically refer to market work. For girls we provide estimates using the inclusive definition, which includes labor force work, subsistence production, and/or domestic work. We do not 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.

Explanatory variables (see Table 4) describe 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 employment status of the father. When the father is absent we try to assess whether the absence is temporary or permanent by examining the marital status of the mother and whether or not her spouse is present. If the mother is found to be married and her spouse not present, we deem the father's absence temporary. When the mother is absent, we check for the presence of a stepmother by checking whether the father has a spouse in the household. The wealth status of the household is determined by a series of dummy variables that indicate whether the household is in the bottom, next

to bottom or top three quintiles of wealth distribution in urban and rural areas respectively. The wealth distribution is proxied by an asset score constructed using principal components analysis[13]. Explanatory variables also include residence in metropolitan, urban non-metropolitan, and rural regions 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.

To identify the schooling equation we rely on a series of labor demand variables that belong in the work equation but are excluded from the schooling equation. These are the presence of farm and non-farm enterprises in the household, log agricultural adult male wage in the governorate of residence in 1993 (the last year for which wage data are available), the proportion of male and female workers in service, trade and agricultural occupations and the proportion of males in craft occupations among the working age male and female populations in the locality. These shares 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 include a variable that indicates whether or not the household has access to piped water.

The descriptive statistics for these variables for all four work/school states are shown in Table 4. Generally, as children grow into young adults, they shift from school-based activities to work-based activities. As expected, the parents of children who work and do not go to school have the lowest average years of schooling followed by those who neither work nor go to school. These two groups of children are more likely to have fathers who are irregular workers in the private sector, as compared to children who work while in school whose fathers are more likely to be employers or self-employed individuals. Working children and those who are not enrolled in school are disproportionately represented in rural areas. Rural children are also more likely to combine work and schooling than urban children. As expected, working children not enrolled in school are disproportionately represented in the lowest urban and rural quintiles. No pattern linking work status with the household composition variables is readily apparent from the descriptive statistics.

Estimation. Our 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 the 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, as 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. (2000). It is applied to the case of the effect of child labor on school progress in a recent 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, allowing both the effect of observables *and* unobservables in the schooling equation to be different in the working and non-working subsamples[14]. In comparison, 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 and untreated samples. Put differently, a bivariate probit approach restricts the correlation coefficients of the disturbances of the work and schooling equations in the treated and untreated regimes to be equal. Given the small number of working children in our sample, it was not possible to estimate separate schooling equations for working and non-working children. We therefore limit our analysis to an additive shift model, where work is included as an endogenous dummy variable in a single

[13] The variables used to construct the asset score include a number of housing quality variables such as the number of rooms, the materials of the roof, walls, and floors, connections to piped water, telephone, electrical and sewerage systems, and ownership of 23 durable consumer goods. Asset scores were constructed separately for uban and rural areas in acknowledgment of the fact that wealth may have different manifestations in these two contexts. See Filmer and Pritchett (2001) for the methodology used to construct the asset score.

[14] Cristobal Ridao-Cano kindly provided us with his Stata program for this estimation procedure.

schooling equation. Moreover, since the restriction of a single correlation coefficient was upheld in all the models we tested, we present the results from a bivariate probit model instead of the less restrictive switching probit model.

The Model.

Assume there are two potential binary schooling outcomes (S_1 and S_0) for the working (W=1) and non-working (W=0) states, respectively, where S_k=1 if the child is attending school and S_k=0 if s/he is not (k = 0, 1). The observed schooling outcome is given by S= W S_1 + (1-W)S_0[15].

The observed binary outcomes are generated according to the underlying latent index structure as follows:

$$W = \mathbf{1}(W^* \geq 0) = \mathbf{1}(Z\beta_w + \varepsilon_w \geq 0)$$
$$S_1 = \mathbf{1}(S_1^* \geq 0) = \mathbf{1}(X\beta_1 + \varepsilon_1 \geq 0) \text{ iff } W = 1$$
$$S_0 = \mathbf{1}(S_0^* \geq 0) = \mathbf{1}(X\beta_0 + \varepsilon_0 \geq 0) \text{ iff } W = 0$$

where W^*, S_0^* and S_1^* 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[16]. Z and X are vectors of regressors, with the need to have at least one regressor in Z that is not in X for purposes of identification. Given the relatively small number of working children in our sample, we refrain from estimating a full set of schooling equation parameters for the working subsample by imposing the restriction $X\beta_1 = \alpha + X\beta_0$, so that the effect of work on schooling introduces an additive shift in the schooling equation. The disturbances $\varepsilon_w, \varepsilon_1, \varepsilon_2$ are assumed to be normally distributed with zero mean and covariance matrix

$$\Sigma = \begin{pmatrix} 1 & \rho_{10} & \rho_{1w} \\ & 1 & \rho_{0w} \\ & & 1 \end{pmatrix}$$

Since S_1 and S_0 are never jointly observed, ρ_{10} is not identified. If the restriction $\rho_{1w} = \rho_{0w}$ is upheld, this model reduces to a bivariate probit model with work as a dummy endogenous variable in the schooling equation. Consistent estimates of the parameters $\beta_w, \alpha, \beta_0, \rho_{1w}, \rho_{0w}$, can be obtained using full information maximum likelihood methods[17]. The log-likelihood function is given by:

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

$$P_{11} = \Pr[W = 1, S = 1] = \Phi_2(Z\beta_w, (\alpha + X\beta_0), \rho_{1w})$$
$$P_{10} = \Pr[W = 1, S = 0] = \Phi_2(Z\beta_w, -(\alpha + X\beta_0), -\rho_{1w})$$
$$P_{01} = \Pr[W = 0, S = 1] = \Phi_2(-Z\beta_w, X\beta_0, -\rho_{0w})$$
$$P_{00} = \Pr[W = 0, S = 0] = \Phi_2(-Z\beta_w, -X\beta_0, \rho_{0w})$$

where Φ_2 is the bivariate normal distribution function.

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:

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

[15] The subscript indexing an individual child is suppressed for brevity.

[16] The decisions are not necessarily sequential. The methodology used allows for the two decisions to be simultaneous.

[17] We used Stata version 7 to produce the estimates presented in this paper.

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.

V. Estimation Results

As described above, we estimate separate models for boys and girls ages 6 to 14. 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 (not counting most child care, which was probably not captured by the survey). 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 5a. For girls we estimate separate models for an inclusive definition of work that includes any of the three types of work (Table 5b) and for an exclusive definition that includes market and subsistence agriculture only (Table 5c). We do not estimate a model that looks at market work only because of the very small number of girls engaged in that kind of work.

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, region, and household wealth. In Model 2, we add the variables indicating the absence of either of the parents, whether the father's absence is temporary, and whether a stepmother is present in case of a mother's absence. In Model 3, we add the father's employment status, and in Model 4, we add the household composition variables. In all models additional 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 explanatory variables. Because the presence or absence of parents and stepparents is unlikely to be influenced by the work and school status of children, Model (2), in our judgment is our most defensible model. We include Models (3) and (4) despite some misgivings about the possible endogeneity of a 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 6 are based on the Model (2) specification.

We started by estimating models that do not impose the restriction that $\rho_{1w} = \rho_{0w}$ and test whether the restriction can be upheld. Since in all cases the restriction was upheld, we only present results for models where the restriction is imposed[18].

We note that several of the variables we rely on for identification are significant determinants of the probability of work for both boys and girls. For boys, the presence of a household farm enterprise and the proportion of males in service and trade occupations in the locality are particularly important[19]. For girls, under the inclusive definition of work, the household 's access to piped water is important because it reduces girl's involvement in fetching water from public sources. The male agricultural wage in the governorate and the proportion of male agricultural and craft workers in the locality are also important determinants of girls' work. This is probably due to a substitution effect within the household. In communities with higher

[18] We obtain the following test statistics for a Wald test of the equality of the two correlation coefficients: For boys, Model (1) $\chi^2(1) = 0.12$, p-value=0.74, Model (2) $\chi^2(1) = 0.24$, p-value=0.63, Model (3) $\chi^2(1) = 0.09$, p-value=0.77, Model (4) $\chi^2(1) = 0.62$, p-value=0.43. For girls (inclusive) Model (1) $\chi^2(1) = 0.03$, p-value=0.87, Model (2) $\chi^2(1) = 0.01$, p-value=0.91, Model (3) $\chi^2(1) = 0.74$, p-value=0.39, Model (4) $\chi^2(1) = 2.58$, p-value=0.11. The unrestricted model failed to converge for girls using the exclusive definition of work.

[19] There may be a question about excluding the household farm and non-farm enterprise variables from the schooling equation since they could indicate additional sources of income for the household. We feel however that income is being controlled for by the inclusion of the wealth variables so that the presence of these enterprises is more likely to be indicating household labor demand. To test that, we ran a version where the two enterprise variables were also included in the schooling equation. Both variables turned out be insignificant determinants of schooling in all models. Some of the remaining identification variables were still significant determinants of work, so the model was still identified, but the power of the identifying variables declined significantly.

demand for market work, girls are asked to do more domestic work in the household, since other household members are more likely to be otherwise occupied. Under the exclusive definition the identification variables perform less well. Since exclusive work mostly consists of subsistence agriculture and animal husbandry, it is likely to be related to the presence of a household farm enterprise, which turns out to be the case in Models (3) and (4), but not in the first two models[20]. Due to the potential identification problem, the results for girls under the exclusive definition are likely to be less reliable. We therefore opt to focus on the results under the inclusive definition.

The Effect of Work on Schooling

Perhaps the most significant finding of this research is that work has no direct effect on schooling for boys, but has a strong effect for girls. As shown in Tables 5a, the coefficient of the "currently working" variable, which indicates the effect of work on the probability of schooling, is statistically insignificant for boys for all models with the exception of Model (1), where it has the wrong sign. For girls, under both the inclusive and exclusive definitions of work (Tables 5b and 5c), the effect of work is large, highly significant and has the expected negative sign. For boys, the negative and significant estimate of ρ indicates that the unobservables that affect work and schooling are inversely correlated. Therefore, unobserved factors that lead to dropping out of school, also lead to higher probability of working. In the case of girls, a positive ρ indicates that unobservables that raise the probability of work also raise the probability of schooling, after the impact of work itself is controlled for.

As shown in Figure 1, which is based on the marginal effects derived from Model (2) shown in Table 6, the probability of schooling is 82.1 percent for a reference boy, 79 percent for a reference girl under the inclusive definition, and 77 percent under the exclusive definition[21]. Work reduces this probability by a mere 7 percentage points for the reference boy, but reduces it by 62 percentage points for a reference girl under the inclusive definition, and by 77 percentage points under the exclusive definition. Boys who work share a variety of observable and unobservable characteristics that make them more likely to drop out of school and engage in market work, but work as such does not have a negative impact on boys' schooling. The situation of girls is quite different. Girls who work (mostly in their own homes) appear to be those who would otherwise be more likely to remain in school. Girl's work seems to be much more detrimental to their schooling, correcting for both observable and unobservable characteristics. We now turn to the effect of other observable characteristics on both work and schooling.

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).

The effects of age are generally significant and very much as anticipated. As expected, rates of work are very low for very young children. They increase earlier for girls than for boys when the inclusive definition of work is used. The results also underscore how much girls' activities that can interfere with schooling are understated when the exclusive definition of work is used. The market definition would understate them even more. Schooling increases at first as children who are delaying schooling finally enroll but then declines as some children drop out after a few years of schooling. The delay in enrolling appears to be much more prevalent among girls than among boys. Although girls engage in more work than boys, their school enrollment rates are reduced by about the same amount with age.

[20] Joint tests of the coefficients of all the identifying variables are highly significant for boys and for girls under the inclusive definition (p-value >>0.01). The results are more mixed for girls under the exclusive definition. For Model (1) $\chi^2(9) = 14.0$, p-value=0.122, Model (2) $\chi^2(9) = 10.9$, p-value=0.289, Model (3) $\chi^2(9) = 16.4$, p-value=0.06, Model (4) $\chi^2(9) = 23.9$, p-value=0.005.

[21] The reference child has zeroes for the dummy variables and has the relevant sample means for the continuous variables other than age. Age is set at 14. Thus the reference child lives in a metropolitan region, his/her parents are present in the household and have the average number of years of schooling, his/her household does not own an enterprise and belongs to the lowest urban quintile of wealth.

However, given the delay in enrollment, they are likely to be in lower grades at that age than boys.

Whether a child is the son or daughter of the household head or some other relative does not have much of an effect on work and schooling. For boys, being a relative has a negative impact on schooling only in the model with all the household composition variables and only at the 10 percent significance level. For girls, there is no detectable effect on either work or schooling under the inclusive work definition, but being a relative has a negative effect on work under the exclusive definition of work. Thus the preponderance of the evidence is that child relatives of the household head are not disadvantaged as it might be assumed. If anything they are less likely to work.

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. We find that father's age has no effect on either work or schooling under all model specifications.

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 girls' schooling under the inclusive work definition (and only at the 10 percent level) but the sign of the effect is counter to our expectations.

There is ample empirical evidence that the education of the parents affects the child labor decision (e.g., Grootaert and Kanbur; 1995). The usual assumption is that the father's education affects boys the most, and mother's education affects girls the most. In his econometric analysis on Thailand between 1985 and 1992, Tzannatos (1998) suggests that work and schooling decisions are significantly related to the education of the parents or the household head. There is a strong inter-generational transfer of human capital from parents to children in the sense that households with more educated parents are more likely to keep their children in school and less likely to have child workers. He finds that the prime reason for not attending school at a young age appears to be the direct cost of education rather than the need for additional income from child work. This suggests that constraints on the household's ability to finance education are significant. In their study of rural Pakistan and Ghana, Bhalotra and Heady (1998) find that only girls with mothers who have completed secondary education work less than other girls. In other studies, the education of the parents or the household head decreases the probability of working and increases the probability of schooling significantly. However, Grootaert (1998) finds that in rural areas of Côte d'Ivoire, an extra year of education for the father increases the probability of combining work and schooling by 7 percentage points, whereas an extra year of education for the mother increases the probability by 3 percentage points.

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. We find that, in general, parental education has little direct effect on boys' work (once household wealth is corrected for) and, if anything, mother's education appears to have a larger effect on boys' work than father's education. Parental education has a powerful positive effect on boys' schooling, however. Although the coefficient of mother's schooling appears to be larger than father's schooling, the difference is not statistically significant. One additional year of father's or mother's schooling increases the probability of boys' schooling by 1 percentage point (Table 6a).

The results for girls are more complicated. We find that father's education has a bigger impact than mother's education on reducing girls' work when the inclusive definition of work is used, but the opposite is true when the exclusive definition of work is used. Since exclusive work consists primarily of assisting the mother in subsistence agriculture and animal husbandry, the negative effect of mother's education suggests that households with more educated mothers are less likely to engage in that kind of activity. However, the mother's education appears to be less important than the father's education in shielding girls from domestic work. The results on the effect of parental education on girls' school enrollment are similar to those of boys but lager in magnitude. The education of both

parents has a powerful impact on girl's schooling, with a slightly larger, but not statistically different effect for mother's education. According to our Model 2 estimates, one year of additional schooling for either of the parents increases the probability of school enrollment by 2 percentage points for girls, or double the effect for boys (Table 6b). About half of the effect is due to increasing the probability of combining work and school and half is due to increasing the probability of school only.

Model 3 is designed to test whether the father's 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 between market work and home. In particular, if the father is engaged in market work, his elasticity of substitution with home work is considered to be zero and all his work hours will be devoted to the market (Levison 1998). Based on this assumption, if the father is present in the household, his employment status is exogenous to the child time allocation. The nature of the fathers' employment also matters - if the father is unemployed or in irregular employment, this may increase the probability that a child does not go to school if the child's labor is used as a substitute for the father. 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. 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, girls 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 work. Because of this we opt to omit the mother's employment status from the explanatory variables.

A series of dummy variables describes the father's sector and type of employment and employment status, for fathers present in the household. 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 bring their sons to work with them. Non-working fathers may stay home and generate more household work for daughters.

Boys with fathers working in the public sector are less likely to work and more likely to go to school than those with fathers in the private sector. Boys with fathers who have no work are less likely to go to school, but are not more likely to work. For girls, having a father who works in the public sector also reduces the probability of work and increases that of school, but this also applies to fathers who are employers or self-employed and to a lesser extent to fathers who hold regular private sector jobs. Thus, for girls, the highest probability of work and lack of schooling is for girls whose father is either a casual wageworker or has no work. The results are stronger for the exclusive definition of work than for the inclusive one, suggesting that the father's employment status does not strongly affect the probability that a girl will engage in domestic work.

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. A father's permanent absence has the expected positive effect on work and negative effect on schooling for boys, although the effect is statistically insignificant. When the absence is temporary, however, these adverse effects are more than reversed, and the difference in the effect between the two types of absence is statistically significant. This suggests 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 no significant effects on either work or schooling[22].

We suspected that children living with their father and a stepmother may be treated differently than children living with their father and their birth mother or children living with only their father. The estimated effects of the

[22] We had to drop the "father absent temporarily" dummy from the work equation in the case of girls under the exclusive definition of work to get the model to converge.

stepmother and mother absent dummy variables are indeed very interesting. Boys living with stepmothers attend school less and are more likely to work. Boys are not affected, however, by the absence of their mother if no stepmother is present. The presence of a stepmother reduces schooling for the reference boy by as much as 30 percentage points and increases work by nearly 40 percentage points. The results for the joint probability of working and not going to school are shown graphically in Figure 2. Girls with absent mothers and no stepmothers seem to take over at least part of the responsibilities of the missing adult woman: their school attendance drops by 32 percentage points and their likelihood of doing a substantial amount of work increases by 19 percentage points. However, when the mother is absent and a stepmother is present, the girls' probability of working is reduced somewhat. When girls have a stepmother present, they do not have to substitute for an absent mother.

Type of Region. For purposes of this analysis, we identify three types of geographical regions in Egypt. The metropolitan regions (the reference category) include Greater Cairo, Alexandria, and the Suez Canal cities. The non-metropolitan urban regions include all other cities in the country, and all rural regions are also combined into one. An examination of the descriptive statistics (Table 4) shows that there are what appear to be large differences among regions in the schooling and work status of boys. While the metropolitan areas contain 19 percent of all boys, they only have 2 percent of boys who combine work and school, 8.2 percent of boys who work and are out of school and 11.5 percent of those who neither work nor are in school. Boys who combine work and school appear to be disproportionately represented in rural areas. In the multivariate analysis, none of the regional dummy variables have an effect on either work or schooling for boys under any of the model specifications examined. 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 presence of a farm enterprise was found to have a positive effect on working and these enterprises are clearly more prevalent in rural areas. Moreover, the household wealth variables we discuss below are defined for urban and rural regions separately and therefore capture some of the urban/rural differences. The disappearance of the regional effect after the inclusion of the wealth and parental education variables, among others, indicates that boys in rural areas do not suffer an intrinsic disadvantage beyond that attributable to the household they are in[23].

In the case of girls, the descriptive statistics also indicate relatively high rates of schooling and low rates of work in the metropolitan region and disproportionately low rates of schooling and high rates of work in rural areas. Over 82 percent of girls who work only and 75 percent of those who neither work nor go to school are in this region, which contains only 60 percent of all girls. Unlike boys, however, the multivariate results for girls, under the inclusive definition of work, show that a significant regional effect remains after correcting for household characteristics. Girls in metropolitan areas are significantly less likely to work than girls in other regions, but girls in non-metropolitan urban areas are more likely to attend school than girls in metropolitan areas. The results for girls, under the exclusive definition, reveal no major differences among girls in the probability of work and schooling, which indicates that most of the increased work burden in non-metropolitan regions is in the form of domestic work.

An examination of the marginal effects shown in Table 6b reveals that the increase in work in non-metropolitan urban and rural areas does not necessarily come at the expense of schooling. Although inclusive work in these regions increases by about 20 percentage points compared to the metropolitan region, most of the increase is among girls who combine work and schooling.

Wealth. 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, connection to a sewer line, and access to piped water and electricity[24]. Principal components analysis was used to obtain the weights that combine the various indicators into a single composite "wealth" score. Because wealth in urban and rural areas takes different

[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.

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

forms, we decided that a single index was not adequate to rank urban and rural households along a wealth continuum. We therefore opted to construct separate wealth scores for urban and rural households. Each group was then divided into quintiles based on their respective scores. Since child labor is a phenomenon that primarily affects poor children, the top three quintiles were lumped into a single category in the regressions shown in Table 5. The lowest quintile is the reference category in both urban and rural areas.

For boys, wealth has the expected positive effect on schooling and negative effect on work in urban areas, although the effect is only significant for the top three quintiles. In rural areas, wealth affects schooling but not work. This is not surprising, because more wealthy rural households are more likely to own farms in which boys would be expected to work even when in school[25]. Moving from the first to the top three quintiles in urban areas raises the probability of being in school for boys by 10.8 percentage points and reduces that of being at work from 7 to 1.7 percent (Table 6a). In rural areas, moving from the bottom to the top three quintiles raises the probability of attending school by 12.3 percentage points and that of being both in school and at work from 0.3 percent to 1.8 percent. For urban boys, the joint probability of working and not being in school declines significantly with wealth starting with the second quintile, but for rural boys it only declines for those in the top three quintiles (See Figure 3).

Girls' schooling is also highly responsive to changes in wealth, but, under the inclusive definition of work, girls' work appears not to be. In both urban and rural areas, the biggest changes in girls' schooling are observed when the household moves from the bottom to the second quintile. As wealth increases, girls are more likely to combine activities, although the probability of work drops off a bit for the top three quintiles. By the time the top three quintiles of wealth are reached, urban girls have increased their schooling by 12 to 14 percentage points and reduced work by almost 4 to 6 percentage points compared to those in the bottom quintile. As shown in figure 3, 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. As household wealth increases, girls in both urban and rural areas, like rural boys, increasingly combine work and schooling. Domestic work appears to be part of girls' responsibilities even in middle class households.

Household Composition. Detailed age/sex categories for household members were included in Model (4) 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 not changed significantly by 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 childcare. Child activities may act as complements or substitutes for the activities of these other household members. The presence of still other 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' work but a number affect their probability of schooling. Their school attendance is decreased by the presence of children under the age of two, suggesting that boys may be pulled out of school to help in child care, which is not captured in the work variable. Their schooling is increased by the presence of females of any age above age 15, who are alternative caregivers. Their work is reduced by the presence of other children aged 6 to 9. 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. They are more likely to attend school the more women above age 60 are in the household. 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, it is increased by the presence of boys 10-14 who add to the domestic work burden of the household. Results relating to the household composition variables under the exclusive definition of work are fairly similar.

[25] 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.

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 time uses that may interfere with such schooling.

To achieve these objectives we needed to define these other time uses in such a way as to ensure that they were inclusive of the various types of work activities that children of both sexes could be engaged in that could potentially interfere with their schooling. We also had to ensure that children were spending sufficient time in these activities for them to potentially interfere with schooling. We therefore chose to use an inclusive definition of work that includes market work, subsistence agriculture, as well as domestic work and to use fourteen hours per week as the cutoff at which a child is considered to be working. We also entertain an exclusive definition of work for girls, which includes only market and subsistence work. It turns out that the definition of work only matters for girls. For boys, a definition that captured market work alone is sufficient.

Although work is strongly associated with not being in school for both boys and girls, we find a strong causal relationship between work and lack of school attendance only for girls. Our 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 characteristics of boys who work appear to pre-dispose them to drop out of school and engage in market work, but the fact that they work does not seem to be directly responsible for their lack of school attendance. In contrast, the results indicate that many girls who work, either according to the exclusive or inclusive definitions of work, would have remained in school had they not been working. Thus work seems to have a much more direct and detrimental effect on girls' schooling. 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.

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 a series of household and community-level labor demand variables to do so, such as the presence of farm and non-farm enterprises in the household, the prevailing adult male agricultural wage, the share of working age males and females in selected occupations, and household access to piped water. Our identifying variables perform well in the case of boys and also in the case of girls under the inclusive definition of work. Our inability to find adequate instruments for subsistence work, which do not also affect schooling, results in poorer identification for girls under the exclusive definition.

With regard to the other determinants of work and schooling, we find that they differ systematically along gender lines and, to a lesser extent, according to the definition of work being used. The probability of leaving school varies similarly with age for boys and girls, but girls are more likely to delay school and begin working at an earlier age. Girls' schooling and work are nearly twice as responsive than those of boys to the education of the father. Even though we attempt to capture wealth effects separately, we interpret the father's education effect as essentially an income effect. Girls' education and work are more income elastic than those of boys. Although the mother's education also has a larger effect on schooling for girls than for boys, it has a weak and insignificant effect on work for both boys and girls. We find that the mother's education has a negative effect on girls' work when the exclusive definition of work is used, but this is probably because households with more educated women tend not to have subsistence agricultural activities.

The employment of the father also has a significant impact on child work and schooling for children of both sexes, but the impact appears to be weaker when the inclusive definition is used for girls. Boys whose fathers work in the public sector have a higher probability of being in school and not being at work than other boys. The daughters of irregular wageworkers have the highest probability of working and not going to school, when the exclusive definition of work is used.

Girls are adversely affected by an absent mother when there is no stepmother in the household. The negative effect on girls is attenuated when a stepmother is present. In effect, when there is no stepmother, the girl must act as a substitute for the mother and her education suffers. Boys, on the other hand, are adversely affected only when there is a stepmother in the household. The effects of a mother's absence and the presence of a stepmother on the probability of schooling are very large. The probability of

girls' schooling falls by nearly 32 percentage points when the mother is absent and there is no stepmother, and the probability of boys' schooling drops 33 percentage points when the mother is absent and a stepmother is present. The probability of work increases by nearly 44 percentage points for boys in this situation.

Our results indicate that region per se has no effect on the schooling or work of boys, once household characteristics have been taken into account. This suggests that there isn't an intrinsic disadvantage due to region, at least for boys. The situation is different for girls. Girls in urban non-metropolitan and rural areas are more likely to combine work and schooling than girls in metropolitan areas, and girls in rural areas are less likely to go to school compared to girls in metropolitan areas.

Household wealth has the expected positive effect on schooling for both boys and girls, but has the expected negative impact on work only for urban boys. At intermediate levels of wealth, rural boys and girls are more likely to combine school and work than stop working altogether. If wealth in rural areas, as measured by housing conditions and consumer durables, 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.

Finally we find that household composition has a significant impact on schooling for both boys and girls but less of an impact on work. The schooling of both boys and girls is hindered by the presence of very young children in the household, because of the need to provide childcare. The presence of young children does not affect work, because our measure of work does not adequately capture childcare. On the other hand, the schooling of children of both sexes is helped by the presence of adult females, because they can act as alternative caregivers.

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Figure 1: Causal Effect of Work on the Predicted Probability of Schooling for Reference Individual

Figure 2: Predicted Joint Probability of Working and Not Going to School for Reference Child by Presence of Mother and Step Mother

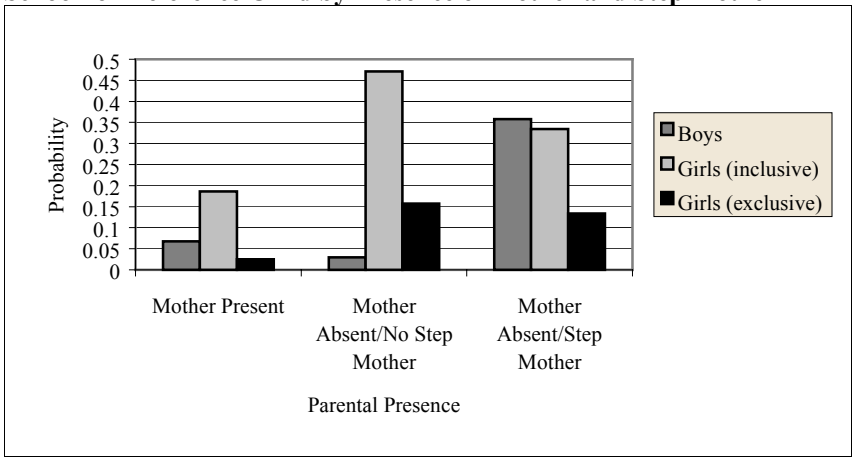

Figure 3: Predicted Joint Probability of Working and Not Going to School by Wealth Quintile, Urban and Rural Areas

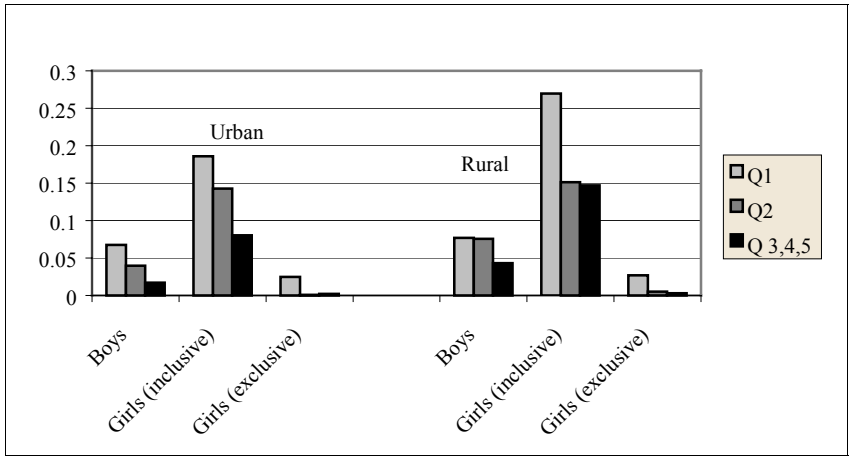

Table 1: Proportions of Children Working and Attending School and Average Hours of Work, Boys and Girls Ages 6-14, Egypt, 1998. (Standard Deviations in Parentheses)

	Boys		Girls	
	Market^	Market^	Exclusive^	Inclusive^
Proportion attending school	0.925	0.860	0.860	0.860
	(0.264)	(0.347)	(0.347)	(0.347)
Proportion working (if work hours/week >=14)	0.044	0.015	0.027	0.319
	(0.205)	(0.123)	(0.163)	(0.466)
Proportion working (if work hours/week >=1)	0.046	0.017	0.080	0.427
	(0.210)	(0.128)	(0.272)	(0.495)
Mutually Exclusive Categories (work >=14 hours/week):				
Proportion in school only	0.909	0.859	0.856	0.645
	(0.287)	(0.348)	(0.352)	(0.479)
Proportion who are both at work and in school	0.016	0.001	0.004	0.215
	(0.124)	(0.038)	(0.067)	(0.411)
Proportion who only work	0.029	0.014	0.023	0.104
	(0.167)	(0.117)	(0.149)	(0.306)
Proportion who are neither at work nor in school	0.047	0.126	0.117	0.035
	(0.211)	(0.332)	(0.322)	(0.185)
Average hours worked/week, if work hours > 0	44.2	49.0	18.0	21.2
	(22.3)	(22.6)	(20.4)	(15.9)
Average hours worked/week, if work hours >= 14	45.9	52.8	39.6	25.5
	(21.4)	(19.3)	(21.7)	(15.9)
Average hours worked/week for those who combine work and school, if work hours >0	24.8	--	8.3	15.7
	(11.4)		(6.7)	8.8
Average hours worked/week for those who combine work and school, if work hours >=14	26.8	--	24.4	19.5
	(10.4)		(7.6)	(8.0)
Number of Observations	2,526	2,437	2,437	2,437

Notes: ^ Market includes only work for purposes of market exchange. Exclusive work includes market work and subsistence agriculture work. Inclusive work includes market work, subsistence agriculture and domestic work. -- denotes fewer than 10 observations
Source: Authors' calculation from ELMS 1998.

Table 2: Job Stability by Employment Status and Sex (Weighted Percentages) Boys and Girls Ages 6-14 Engaged in Market Work, Egypt, 1998

Job Stability	Boys			Girls		
	Total	Wage Workers	Unpaid Family Workers	Total	Wage Workers	Unpaid Family Workers
Permanent	53	53.3	52.7	74.6	54.5	100.0
Temporary	10.2	8.1	12.7	12.5	22.4	0.0
Seasonal	17.7	8.4	28.5	7.4	13.3	0.0
Casual	19.1	30.3	6.1	5.5	9.8	0.0
N	105	57	48	34	20	14

Source: Authors' calculation from ELMS 1998

Table 3: Industries of Child Workers (Weighted Percentages of 3-Digit Industry Codes) Boys and Girls with Weekly Work Hours >= 14, Ages 6-14, Egypt, 1988

Industry	Boys	Girls	
	Market	Market	Exclusive
Agriculture	63.9	65.9	81.3
Food preparation	2.0	6.7	3.7
Textiles – spinning, weaving	0.0	4.7	2.6
Garments	0.6	4.4	2.4
Wood industries	2.3	0.0	0.0
Furniture	1.6	0.0	0.0
Metal manufacturing	4.3	0.0	0.0
Construction	5.2	0.0	0.0
Retail	5.2	7.7	4.2
Restaurants	0.5	0.0	0.0
Repair	9.3	0.0	0.0
Misc. personal services	9.3	0.0	0.0
N	105	34	58

Source: Authors' calculations from ELMS 1998.

Table 4: Weighted Means and Standard Deviations of all Explanatory Variables - Boys and Girls 6-14, Egypt, 1998.

		Boys					Girls (inclusive definition of work)				
Variable Name	**Variable**	**All**	**School only**	**Work & School**	**Work only**	**Neither**	**All**	**School only**	**Work &School**	**Work only**	**Neither**
age	age	10.24	10.12	12.91	12.52	10.36	10.36	9.74	11.84	11.67	8.84
		(2.48)	(2.45)	(1.59)	(1.59)	(2.66)	(2.49)	(2.40)	(1.92)	(2.08)	(2.75)
age squared/100	agesq	1.111	1.084	1.692	1.592	1.142	1.135	1.005	1.438	1.405	0.855
		(0.504)	(0.494)	(0.375)	(0.362)	(0.543)	(0.506)	(0.475)	(0.427)	(0.455)	(0.523)
son or daughter of	sondaug	0.898	0.901	0.776	0.910	0.872	0.909	0.907	0.917	0.888	0.957
household head		(0.303)	(0.299)	(0.422)	(0.288)	(0.335)	(0.287)	(0.290)	(0.276)	(0.316)	(0.205)
not son or daughter	othrel	0.102	0.099	0.224	0.090	0.128	0.091	0.093	0.083	0.112	0.043
of household head		(0.303)	(0.299)	(0.422)	(0.288)	(0.335)	(0.287)	(0.290)	(0.276)	(0.316)	(0.205)
father's years of	fthyrsch	6.337	6.691	4.602	2.245	2.543	6.537	7.560	6.302	1.729	3.512
schooling		(5.704)	(5.755)	(3.943)	(2.873)	(3.777)	(5.790)	(5.844)	(5.545)	(2.697)	(4.535)
mother's years of	mthyrsch	4.493	4.829	1.591	0.966	1.100	4.659	5.642	4.183	0.585	1.655
schooling		(5.373)	(5.472)	(3.007)	(1.763)	(2.528)	(5.497)	(5.755)	(5.007)	(1.535)	(3.781)
father absent	fathabs	0.116	0.112	0.077	0.228	0.144	0.109	0.110	0.109	0.109	0.091
		(0.320)	(0.315)	(0.270)	(0.422)	(0.353)	(0.312)	(0.313)	(0.312)	(0.313)	(0.289)
father absent	fabsmmar	0.052	0.055	0.013	0.030	0.025	0.046	0.052	0.038	0.020	0.046
temporarily		(0.223)	(0.229)	(0.113)	(0.171)	(0.157)	(0.209)	(0.223)	(0.191)	(0.139)	(0.212)
mother absent	mothabs	0.029	0.025	0.026	0.043	0.103	0.030	0.019	0.036	0.054	0.122
		(0.168)	(0.156)	(0.161)	(0.204)	(0.305)	(0.171)	(0.138)	(0.187)	(0.226)	(0.330)
step mother	stpmom	0.009	0.006	0.026	0.021	0.062	0.010	0.005	0.012	0.006	0.090
present		(0.096)	(0.076)	(0.161)	(0.145)	(0.242)	(0.100)	(0.074)	(0.111)	(0.079)	(0.288)
father's age when	fage6	35.82	35.91	36.61	33.42	35.21	36.41	36.34	35.97	37.24	37.94
age 6		(14.85)	(14.55)	(13.71)	(20.53)	(16.90)	(14.66)	(14.57)	(14.72)	(15.03)	(14.85)

Table 4: contd.

		Boys					Girls (inclusive definition of work)				
Variable Name	**Variable**	**All**	**School only**	**Work & School**	**Work only**	**Neither**	**All**	**School only**	**Work &School**	**Work only**	**Neither**
difference btw father's and mother's age	fmagedf	6.347 (5.542)	6.338 (5.370)	6.614 (4.788)	6.665 (8.256)	6.244 (6.952)	6.552 (5.439)	6.411 (5.211)	6.650 (5.488)	7.484 (5.923)	5.769 (7.222)
father works in public sector (if present)*	fpub	0.359 (0.480)	0.382 (0.486)	0.236 (0.430)	0.067 (0.252)	0.136 (0.345)	0.345 (0.475)	0.385 (0.487)	0.341 (0.475)	0.148 (0.356)	0.222 (0.418)
father works in regular priv.) sect. Job (if present	fprvrg	0.116 (0.320)	0.120 (0.324)	0.020 (0.143)	0.116 (0.322)	0.074 (0.264)	0.118 (0.323)	0.115 (0.319)	0.130 (0.336)	0.127 (0.334)	0.082 (0.277)
father work in irregular priv. Sect. job (if present)	Fprvir	0.090 (0.286)	0.081 (0.273)	0.058 (0.236)	0.111 (0.317)	0.266 (0.444)	0.091 (0.287)	0.068 (0.252)	0.061 (0.240)	0.247 (0.432)	0.225 (0.421)
father is non-wage worker (if present)	fnwag	0.253 (0.435)	0.248 (0.432)	0.609 (0.495)	0.345 (0.479)	0.156 (0.364)	0.260 (0.439)	0.256 (0.436)	0.281 (0.450)	0.229 (0.421)	0.315 (0.468)
father isn't working (if present)	fnowk	0.067 (0.250)	0.058 (0.234)	0.000 (0.000)	0.134 (0.343)	0.223 (0.418)	0.077 (0.266)	0.067 (0.250)	0.077 (0.267)	0.140 (0.347)	0.066 (0.249)
urban metropolitan region	urbmetro	0.194 (0.396)	0.205 (0.404)	0.020 (0.143)	0.082 (0.276)	0.115 (0.320)	0.235 (0.424)	0.286 (0.452)	0.165 (0.372)	0.097 (0.297)	0.124 (0.331)
urban non-metropolitan region	urbnmtro	0.172 (0.378)	0.177 (0.382)	0.096 (0.299)	0.161 (0.370)	0.121 (0.328)	0.169 (0.375)	0.177 (0.382)	0.197 (0.398)	0.079 (0.270)	0.131 (0.340)
rural region	rural	0.634 (0.482)	0.619 (0.486)	0.883 (0.325)	0.757 (0.432)	0.764 (0.427)	0.596 (0.491)	0.537 (0.499)	0.638 (0.481)	0.824 (0.382)	0.745 (0.439)

Table 4: contd.

		Boys					Girls (inclusive definition of work)				
Variable Name	**Variable**	**All**	**School only**	**Work & School**	**Work only**	**Neither**	**All**	**School only**	**Work &School**	**Work only**	**Neither**
HH in lowest urban quintile*	qwurb1	0.087	0.082	0.061	0.182	0.140	0.089	0.082	0.090	0.114	0.136
		(0.282)	(0.274)	(0.242)	(0.389)	(0.349)	(0.285)	(0.275)	(0.286)	(0.318)	(0.346)
HH in 2nd lowest urban quintile	qwurb2	0.070	0.072	0.035	0.051	0.042	0.086	0.094	0.089	0.047	0.032
		(0.255)	(0.259)	(0.187)	(0.223)	(0.202)	(0.280)	(0.292)	(0.285)	(0.211)	(0.178)
HH in top three urban quintiles	qwurb345	0.210	0.228	0.020	0.009	0.053	0.229	0.287	0.183	0.016	0.086
		(0.407)	(0.419)	(0.143)	(0.096)	(0.225)	(0.421)	(0.453)	(0.387)	(0.124)	(0.282)
HH in lowest rural quintile*	qwrur1	0.139	0.120	0.286	0.292	0.356	0.103	0.064	0.079	0.311	0.345
		(0.346)	(0.325)	(0.458)	(0.458)	(0.481)	(0.304)	(0.244)	(0.269)	(0.464)	(0.479)
HH in 2nd lowest rural quintile	qwrur2	0.133	0.124	0.160	0.170	0.266	0.142	0.120	0.163	0.243	0.117
		(0.339)	(0.330)	(0.371)	(0.378)	(0.444)	(0.349)	(0.324)	(0.369)	(0.430)	(0.324)
HH in top three rural quintiles	qwrur345	0.362	0.374	0.437	0.296	0.143	0.351	0.353	0.396	0.270	0.283
		(0.481)	(0.484)	(0.503)	(0.460)	(0.352)	(0.478)	(0.478)	(0.490)	(0.445)	(0.454)
HH owns non-farm enterprise	nfrmentp	0.219	0.227	0.117	0.134	0.150	0.205	0.227	0.206	0.100	0.109
		(0.414)	(0.419)	(0.325)	(0.343)	(0.359)	(0.404)	(0.419)	(0.405)	(0.301)	(0.314)
HH owns farm enterprise	farmentp	0.187	0.179	0.761	0.342	0.061	0.180	0.158	0.203	0.241	0.254
		(0.390)	(0.383)	(0.432)	(0.478)	(0.240)	(0.384)	(0.365)	(0.403)	(0.429)	(0.439)

Table 4: contd.

		Boys					Girls (inclusive definition of work)				
Variable Name	**Variable**	**All**	**School only**	**Work & School**	**Work only**	**Neither**	**All**	**School only**	**Work &School**	**Work only**	**Neither**
Log adult male agric wage in governorate in 1993	lwag93	6.367 (0.184)	6.374 (0.181)	6.343 (0.154)	6.311 (0.165)	6.271 (0.222)	6.383 (0.179)	6.394 (0.177)	6.380 (0.178)	6.352 (0.169)	6.309 (0.218)
prop. female service & trade workers in locality	pfsrvtrd	0.006 (0.005)	0.006 (0.005)	0.004 (0.004)	0.005 (0.004)	0.004 (0.004)	0.006 (0.006)	0.007 (0.006)	0.006 (0.005)	0.004 (0.005)	0.004 (0.005)
prop. female agric. workers in locality	pfagroc	0.016 (0.049)	0.015 (0.046)	0.033 (0.077)	0.044 (0.092)	0.018 (0.041)	0.014 (0.043)	0.011 (0.037)	0.013 (0.042)	0.029 (0.064)	0.020 (0.049)
prop male service & trade workers in locality	pmsrvtrd	0.070 (0.028)	0.070 (0.028)	0.086 (0.023)	0.073 (0.031)	0.060 (0.025)	0.071 (0.028)	0.072 (0.028)	0.071 (0.026)	0.068 (0.028)	0.065 (0.030)
prop. male agric. workers in locality	pmagroc	0.263 (0.203)	0.253 (0.202)	0.371 (0.167)	0.344 (0.185)	0.368 (0.205)	0.248 (0.204)	0.217 (0.199)	0.263 (0.198)	0.365 (0.185)	0.364 (0.207)
prop. male craft workers in locality	pmcraft	0.127 (0.080)	0.128 (0.081)	0.099 (0.061)	0.123 (0.083)	0.113 (0.071)	0.132 (0.081)	0.136 (0.077)	0.132 (0.086)	0.116 (0.083)	0.120 (0.095)
household has access to piped water	pwater	0.842 (0.365)	0.856 (0.351)	0.672 (0.476)	0.650 (0.481)	0.734 (0.444)	0.860 (0.347)	0.920 (0.271)	0.812 (0.391)	0.626 (0.485)	0.750 (0.436)
prop. male with secondary sch. & abv.	pmsecabv	0.272 (0.117)	0.278 (0.118)	0.206 (0.089)	0.224 (0.085)	0.215 (0.093)	0.277 (0.116)	0.295 (0.119)	0.264 (0.094)	0.216 (0.111)	0.209 (0.112)
prop. female with secondary sch. & abv.	pfsecabv	0.176 (0.124)	0.181 (0.125)	0.101 (0.077)	0.139 (0.090)	0.118 (0.100)	0.180 (0.122)	0.198 (0.125)	0.173 (0.101)	0.110 (0.114)	0.104 (0.114)

Table 4: contd.

		Boys					Girls (inclusive definition of work)				
Variable Name	**Variable**	**All**	**School only**	**Work & School**	**Work only**	**Neither**	**All**	**School only**	**Work &School**	**Work only**	**Neither**
number of children 0 to 2 in hh	nch0_2	0.334 (0.566)	0.323 (0.561)	0.389 (0.557)	0.356 (0.532)	0.516 (0.653)	0.349 (0.567)	0.331 (0.556)	0.311 (0.554)	0.397 (0.524)	0.778 (0.767)
number of children 3 to 5	nch3_5	0.471 (0.652)	0.470 (0.657)	0.320 (0.547)	0.420 (0.588)	0.572 (0.630)	0.550 (0.701)	0.563 (0.709)	0.454 (0.628)	0.679 (0.774)	0.525 (0.685)
number of boys/girls 6 to 9	nch6_9	0.562 (0.743)	0.563 (0.747)	0.551 (0.653)	0.499 (0.705)	0.582 (0.721)	0.593 (0.731)	0.559 (0.728)	0.564 (0.671)	0.808 (0.826)	0.750 (0.732)
number of girls 10 to 14	ng10_14	0.477 (0.660)	0.468 (0.652)	0.652 (0.958)	0.526 (0.649)	0.559 (0.685)	0.475 (0.650)	0.452 (0.634)	0.455 (0.634)	0.625 (0.731)	0.575 (0.731)
number of boys 10 to 14	nby10_14	0.453 (0.624)	0.446 (0.620)	0.591 (0.756)	0.552 (0.658)	0.500 (0.636)	0.469 (0.640)	0.445 (0.625)	0.487 (0.673)	0.619 (0.630)	0.336 (0.686)
number of females 15 to 17	nf15_17	0.299 (0.549)	0.304 (0.556)	0.343 (0.571)	0.370 (0.534)	0.148 (0.369)	0.284 (0.534)	0.274 (0.524)	0.281 (0.528)	0.335 (0.614)	0.326 (0.498)
number of males 15 to 17	nm15_17	0.317 (0.543)	0.309 (0.543)	0.447 (0.577)	0.443 (0.509)	0.348 (0.538)	0.271 (0.502)	0.253 (0.489)	0.303 (0.521)	0.290 (0.501)	0.339 (0.590)
number of females 18-59	nf18_59	0.455 (0.817)	0.448 (0.810)	1.005 (1.196)	0.421 (0.791)	0.412 (0.753)	0.434 (0.801)	0.425 (0.790)	0.424 (0.828)	0.528 (0.839)	0.385 (0.706)
number of males 18-59	nm18_59	0.572 (0.904)	0.549 (0.894)	1.020 (0.894)	0.958 (1.091)	0.631 (0.909)	0.573 (0.902)	0.513 (0.854)	0.651 (0.995)	0.765 (0.951)	0.613 (0.901)
number of females 60+	nf60ab	0.131 (0.348)	0.135 (0.353)	0.211 (0.413)	0.095 (0.295)	0.059 (0.237)	0.138 (0.352)	0.141 (0.355)	0.156 (0.369)	0.098 (0.312)	0.094 (0.293)
number of males 60+	nm60ab	0.066 (0.248)	0.068 (0.251)	0.064 (0.248)	0.029 (0.170)	0.048 (0.216)	0.067 (0.250)	0.070 (0.256)	0.061 (0.239)	0.069 (0.254)	0.036 (0.187)
Number of observations	Obs	2526	2320	38	69	99	2437	1632	535	200	70

Table 5a: Bivariate Probit Coefficient Estimates for the Probabilities of Working and Attending School, Boys, 6-14, Market Work, Egypt, 1998.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
currently working	-	0.454 ***		0.310	-	-0.004	-	-0.050
	-	(0.054)	-	(0.464)	-	(0.601)	-	(0.490)
age	-0.236	0.403 **	-0.132	0.350 *	-0.085	0.359 *	-0.081	0.314 *
	(0.220)	(0.188)	(0.239)	(0.193)	(0.253)	(0.192)	(0.273)	(0.179)
age squared/100	2.222 **	-2.440 ***	1.779	-2.161 **	1.624	-2.123 **	1.678	-1.979 **
	(1.055)	(0.887)	(1.105)	(0.939)	(1.168)	(0.941)	(1.225)	(0.870)
not son or daughter of	0.034	-0.144	0.064	-0.136	0.057	-0.078	0.120	-0.377 *
household head	(0.229)	(0.222)	(0.286)	(0.199)	(0.277)	(0.215)	(0.275)	(0.226)
father's age when age 6	-0.003	0.001	0.003	-0.003	0.000	0.005	-0.008	0.000
	(0.005)	(0.005)	(0.010)	(0.010)	(0.010)	(0.009)	(0.012)	(0.011)
difference btw father's &	0.002	0.005	0.001	0.002	0.001	0.003	0.007	0.011
mother's age	(0.012)	(0.012)	(0.015)	(0.014)	(0.013)	(0.014)	(0.014)	(0.014)
father absent	-	-	0.637	-0.503	0.358	0.002	0.070	-0.155
	-	-	(0.499)	(0.445)	(0.523)	(0.396)	(0.532)	(0.442)
father absent temporarily	-	-	-0.704	0.798 **	-0.734	0.771 **	-0.713 *	0.912 ***
	-	-	(0.456)	(0.365)	(0.474)	(0.339)	(0.426)	(0.354)
mother absent	-	-	-0.416	-0.092	-0.481	-0.123	-0.474	-0.087
	-	-	(0.368)	(0.375)	(0.374)	(0.372)	(0.373)	(0.318)
step mother present	-	-	1.391 ***	-0.997 **	1.548 ***	-1.042 **	1.730 ***	-1.276 ***
	-	-	(0.488)	(0.494)	(0.457)	(0.495)	(0.466)	(0.489)
father's years of schooling	-0.009	0.031 ***	-0.015	0.032 **	-0.007	0.022	-0.014	0.027 *
	(0.014)	(0.012)	(0.015)	(0.013)	(0.014)	(0.015)	(0.014)	(0.016)
mother's years of schooling	-0.039 **	0.047 **	-0.027	0.041 **	-0.024	0.044 *	-0.028	0.045 **
	(0.019)	(0.021)	(0.021)	(0.021)	(0.020)	(0.022)	(0.020)	(0.023)

Table 5a: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
father is public sector worker	-	-	-	-	-0.568 **	0.518 ***	-0.620 ***	0.490 **
(if present)	-	-	-	-	(0.239)	(0.190)	(0.231)	(0.194)
father is regular wage worker	-	-	-	-	-0.071	0.219	-0.061	0.234
(if present)	-	-	-	-	(0.277)	(0.206)	(0.243)	(0.199)
father is non-wage worker	-	-	-	-	-0.118	0.230	-0.161	0.164
(if present)	-	-	-	-	(0.295)	(0.277)	(0.266)	(0.250)
father has no work	-	-	-	-	0.073	-0.418 **	0.068	-0.396 **
(if present)	-	-	-	-	(0.294)	(0.179)	(0.245)	(0.163)
urban non-metropolitan	0.199	0.074	0.304	0.076	0.490	0.028	0.507	0.073
	(0.239)	(0.164)	(0.301)	(0.180)	(0.363)	(0.175)	(0.338)	(0.179)
rural	0.009	0.111	0.134	0.088	0.252	0.097	0.384	0.118
	(0.292)	(0.223)	(0.357)	(0.234)	(0.417)	(0.225)	(0.386)	(0.227)
HH in 2nd lowest urban quintile	-0.388	0.322 *	-0.246	0.298	-0.171	0.287	-0.133	0.301
	(0.249)	(0.193)	(0.274)	(0.190)	(0.254)	(0.193)	(0.269)	(0.194)
HH in top three urban quintiles	-0.809 ***	0.594 ***	-0.632 ***	0.555 ***	-0.664 **	0.483 **	-0.641 **	0.565 **
	(0.219)	(0.185)	(0.221)	(0.201)	(0.270)	(0.238)	(0.252)	(0.244)
HH in 2nd lowest rural quintile	0.086	0.203	0.067	0.177	0.158	0.100	0.075	0.148
	(0.185)	(0.184)	(0.216)	(0.186)	(0.220)	(0.188)	(0.185)	(0.182)
HH in top three rural quintiles	-0.152	0.535 ***	-0.152	0.565 ***	-0.016	0.482 ***	-0.081	0.545 ***
	(0.165)	(0.156)	(0.201)	(0.169)	(0.234)	(0.170)	(0.210)	(0.154)
prop male w/secondary sch. & abv.*	-0.023	1.825 ***	-0.044	1.843 ***	0.006	1.668 **	0.063	1.354 *
	(1.355)	(0.681)	(1.429)	(0.689)	(1.643)	(0.705)	(1.721)	(0.759)
HH owns non-farm enterprise	0.213 *		0.237 **		0.152		0.173	
	(0.117)		(0.115)		(0.225)		(0.210)	

Table 5a: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
HH owns farm enterprise	0.682 ***		0.775 ***	-	0.807 ***	-	0.895 ***	-
	(0.093)	-	(0.240)	-	(0.163)	-	(0.163)	-
Log adult male agric wage	0.479	-	0.485	-	0.532	-	0.379	-
in governorate	(0.351)	-	(0.360)	-	(0.461)	-	(0.445)	-
prop female service & trade	23.82	-	22.786	-	31.587	-	35.904	-
workers in locality	(17.63)	-	(18.25)	-	(25.45)	-	(22.54)	-
prop female agric. workers								
in locality	-0.779	-	-0.780	-	-0.528	-	-0.745	-
	(0.527)	-	(1.268)	-	(1.497)	-	(1.307)	-
prop male service & trade	5.799 ***		7.104	-	8.814 **	-	8.973 **	-
workers in locality	(2.091)	-	(4.397)	-	(4.159)	-	(4.084)	
prop male agric. workers in	1.470 *	-	1.528	-	1.646	-	1.362	-
locality	(0.856)	-	(0.977)	-	(1.081)	-	(1.210)	-
prop male craft workers in	1.718	-	1.789	-	2.141	-	1.994	-
locality	(1.163)	-	(1.713)	-	(1.686)	-	(1.605)	-
household has access to	-0.210 **	-	-0.224 **	-	-0.251 **	-	-0.276 **	-
piped water	(0.096)	-	(0.090)	-	(0.109)	-	(0.117)	-
number of children 0 to 2 in	-	-	-	-	-	-	0.113	-0.213 **
hh	-	-	-	-	-	-	(0.105)	(0.100)
number of children 3 to 5	-	-	-	-	-	-	-0.089	0.032
	-	-	-	-	-	-	(0.115)	(0.099)
number of boys/girls 6 to 9	-	-	-	-	-	-	-0.192 **	0.080
	-	-	-	-	-	-	(0.077)	(0.087)
number of girls 10 to 14	-	-	-	-	-	-	0.135	-0.119
	-	-	-	-	-	-	(0.089)	(0.079)

Table 5a: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
number of boys 10 to 14	-	-	-	-	-	-	0.198	-0.136
	-	-	-	-	-	-	(0.128)	(0.117)
number of females 15 to 17	-	-	-	-	-	-	-0.014	0.311 ***
	-	-	-	-	-	-	(0.076)	(0.096)
number of males 15 to 17	-	-	-	-	-	-	0.158 *	0.023
	-	-	-	-	-	-	(0.094)	(0.089)
number of females 18-59	-	-	-	-	-	-	-0.063	0.206 **
	-	-	-	-	-	-	(0.112)	(0.097)
number of males 18-59	-	-	-	-	-	-	0.059	-0.046
	-	-	-	-	-	-	(0.108)	(0.103)
number of females 60+	-	-	-	-	-	-	-0.154	0.493 **
	-	-	-	-	-	-	(0.263)	(0.219)
number of males 60+	-	-	-	-	-	-	-0.176	0.033
	-	-	-	-	-	-	(0.267)	(0.272)
intercept	-5.959 **	-1.144	-7.138 **	-0.640	-7.909 **	-1.142	-6.858 *	-0.657
	(2.887)	(0.933)	(3.247)	(1.091)	(3.840)	(1.084)	(3.869)	(1.088)
correlation of errors (rho)	-1.000		-0.970		-0.902		-0.900	
	(0.000)		(0.097)		(0.157)		(0.123)	
p-value for Wald test of rho=0	0.000		0.197		0.079		0.023	
Log likelihood	-793.98		-779.94		-760.67		-727.57	
Number of observations	2526		2526		2526		2526	

Notes: Statistical significance at the 1%(***), 5%(**), and 10%(*) levels is marked. Standard errors are in parentheses.

Table 5b: Bivariate Probit Coefficient Estimates for the Probabilities of Working and Attending School, Girls, 6-14, Inclusive Work, Egypt, 1998.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
currently working		-2.336 ***		-2.332 ***		-2.301 ***		-2.360 ***
		(0.194)		(0.191)		(0.193)		(0.202)
age	0.292 **	0.578 ***	0.281 **	0.615 ***	0.302 **	0.641 ***	0.333 **	0.698 ***
	(0.136)	(0.147)	(0.138)	(0.146)	(0.137)	(0.141)	(0.137)	(0.147)
age squared/100	-0.154	-2.187 ***	-0.105	-2.369 ***	-0.204	-2.511 ***	-0.327	-2.807 ***
	(0.647)	(0.717)	(0.659)	(0.713)	(0.650)	(0.685)	(0.649)	(0.715)
not son or daughter of	0.147	0.062	0.067	0.123	0.048	0.109	0.076	0.086
household head	(0.137)	(0.151)	(0.140)	(0.149)	(0.138)	(0.151)	(0.193)	(0.213)
father's age when age 6	0.000	-0.005	-0.006	-0.005	-0.008	-0.005	-0.004	-0.013
	(0.004)	(0.004)	(0.007)	(0.008)	(0.007)	(0.009)	(0.007)	(0.010)
difference btw father's &	0.005	0.021 *	0.007	0.017	0.007	0.017	0.004	0.023 *
mother's age	(0.010)	(0.012)	(0.010)	(0.012)	(0.010)	(0.013)	(0.010)	(0.014)
father absent	-	-	-0.282	0.112	-0.429	0.370	-0.250	-0.011
	-	-	(0.300)	(0.358)	(0.343)	(0.377)	(0.345)	(0.427)
father absent temporarily	-	-	-0.053	-0.374	-0.059	-0.371	-0.145	-0.296
	-	-	(0.239)	(0.299)	(0.238)	(0.301)	(0.236)	(0.319)
mother absent	-	-	0.491 *	-0.416	0.486 *	-0.429	0.503 *	-0.463
	-	-	(0.272)	(0.317)	(0.272)	(0.310)	(0.278)	(0.345)
step mother present	-	-	-0.790	-0.194	-0.791	-0.155	-0.761	0.108
	-	-	(0.482)	(0.664)	(0.489)	(0.647)	(0.486)	(0.654)
father's years of schooling	-0.024 **	0.037 ***	-0.026 **	0.040 ***	-0.024 **	0.041 ***	-0.025 **	0.047 ***
	(0.011)	(0.014)	(0.010)	(0.014)	(0.011)	(0.016)	(0.011)	(0.015)
mother's years of	-0.013	0.056 ***	-0.013	0.052 ***	-0.012	0.051 ***	-0.014	0.049 ***
schooling	(0.012)	(0.018)	(0.012)	(0.018)	(0.012)	(0.017)	(0.011)	(0.017)

Table 5b: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
father is public sector worker	-	-	-	-	-0.147	0.303	-0.134	0.303
(if present)	-	-	-	-	(0.173)	(0.209)	(0.176)	(0.214)
father is regular wage worker	-	-	-	-	-0.097	0.343	-0.091	0.384
(if present)	-	-	-	-	(0.202)	(0.219)	(0.208)	(0.238)
father is non-wage worker	-	-	-	-	-0.207	0.319 *	-0.197	0.331 *
(if present)	-	-	-	-	(0.209)	(0.171)	(0.215)	(0.173)
father has no work	-	-	-	-	0.100	0.191	0.106	0.198
(if present)	-	-	-	-	(0.210)	(0.193)	(0.216)	(0.185)
urban non-metropolitan	0.630 ***	0.521 ***	0.637 ***	0.522 ***	0.655 ***	0.539 ***	0.639 ***	0.609 ***
	(0.174)	(0.175)	(0.176)	(0.173)	(0.178)	(0.177)	(0.181)	(0.178)
rural	0.552 **	0.270	0.553 **	0.262	0.550 **	0.326	0.551 **	0.345
	(0.257)	(0.219)	(0.261)	(0.213)	(0.263)	(0.223)	(0.261)	(0.237)
HH in 2nd lowest urban quintile	0.131	0.324 **	0.136	0.315 **	0.143	0.298 *	0.139	0.305 *
	(0.141)	(0.155)	(0.141)	(0.155)	(0.143)	(0.162)	(0.140)	(0.168)
HH in top three urban quintiles	-0.156	0.321 *	-0.142	0.338 *	-0.144	0.335 *	-0.127	0.294
	(0.132)	(0.187)	(0.133)	(0.180)	(0.134)	(0.186)	(0.129)	(0.182)
HH in 2nd lowest rural quintile	-0.095	0.476 ***	-0.096	0.467 ***	-0.074	0.413 **	-0.083	0.368 **
	(0.162)	(0.165)	(0.166)	(0.162)	(0.165)	(0.178)	(0.175)	(0.170)
HH in top three rural quintiles	-0.115	0.472 ***	-0.112	0.480 ***	-0.099	0.414 ***	-0.089	0.408 ***
	(0.163)	(0.121)	(0.167)	(0.126)	(0.162)	(0.143)	(0.169)	(0.136)
prop female w/secondary sch. & abv.*	1.517 *	1.641 *	1.407 *	1.606 *	1.521 *	1.612 *	1.495 *	1.147
	(0.809)	(0.895)	(0.792)	(0.850)	(0.808)	(0.862)	(0.804)	(0.810)
HH owns non-farm enterprise	-0.203 **	-	-0.212 **	-	-0.095	-	-0.084	-
	(0.100)	-	(0.105)	-	(0.142)	-	(0.149)	-

Table 5b: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
HH owns farm enterprise	-0.067	-	-0.080	-	0.072	-	0.079	-
	(0.089)	-	(0.089)	-	(0.126)	-	(0.123)	-
Log adult male agric	1.153 ***		1.134 ***		1.167 ***		1.108 ***	
wage in governorate	(0.325)	-	(0.336)	-	(0.350)	-	(0.354)	-
prop female service &	3.284	-	4.671	-	5.285	-	5.679	-
trade workers in locality	(14.49)	-	(14.76)	-	(14.91)	-	(14.95)	-
prop female agric.	-0.749	-	-0.803	-	-0.874	-	-0.812	-
workers in locality	(0.794)	-	(0.761)	-	(0.693)	-	(0.697)	-
prop male service & trade	3.957 *	-	3.785 *	-	4.350 **	-	4.141 **	-
workers in locality	(2.072)	-	(2.073)	-	(2.045)	-	(2.015)	-
prop male agric. workers	2.336 ***		2.309 ***		2.404 ***		2.269 ***	
in locality	(0.621)	-	(0.625)	-	(0.636)	-	(0.630)	-
prop male craft workers	2.497 ***		2.503 ***		2.557 ***		2.430 ***	
in locality	(0.799)	-	(0.818)	-	(0.810)	-	(0.830)	-
household has access to	-0.630 ***		-0.638 ***		-0.626 ***		-0.586 ***	
piped water	(0.131)	-	(0.133)	-	(0.131)	-	(0.135)	-
number of children 0 to 2	-	-	-	-	-	-	0.009	-0.261 ***
in hh	-	-	-	-	-	-	(0.076)	(0.091)
number of children 3 to 5	-		-	-	-	-	0.030	0.002
	-	-	-	-	-	-	(0.053)	(0.053)
number of boys/girls 6 to 9	-	-	-	-	-	-	0.000	-0.193 ***
	-	-	-	-	-	-	(0.050)	(0.074)
number of girls 10 to 14	-	-	-	-	-	-	0.077	-0.107
	-	-	-	-	-	-	(0.072)	(0.079)
number of boys 10 to 14	-	-	-	-	-	-	0.105 *	0.043
	-	-	-	-	-	-	(0.058)	(0.080)

Table 5b: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
number of females 15 to	-	-	-	-	-	-	-0.047	-0.071
17	-	-	-	-	-	-	(0.075)	(0.071)
number of males 15 to 17	-	-	-	-	-	-	-0.012	-0.013
	-	-	-	-	-	-	(0.077)	(0.112)
number of females 18-59	-	-	-	-	-	-	-0.080	0.066
	-	-	-	-	-	-	(0.053)	(0.073)
number of males 18-59	-	-	-	-	-	-	0.021	0.027
	-	-	-	-	-	-	(0.055)	(0.076)
number of females 60+	-	-	-	-	-	-	-0.012	0.401 ***
	-	-	-	-	-	-	(0.122)	(0.135)
number of males 60+	-	-	-	-	-	-	0.006	-0.100
	-	-	-	-	-	-	(0.188)	(0.243)
intercept	-11.88 ***	-2.696 ***	-11.45 ***	-2.798 ***	-11.76 ***	-3.172 ***	-11.73 ***	-2.882 ***
	(2.392)	(0.760)	(2.465)	(0.812)	(2.568)	(0.821)	(2.559)	(0.875)
correlation of errors (rho)	0.805		0.798		0.771		0.783	
	(0.105)		(0.107)		(0.107)		(0.110)	
p-value for Wald test of rho=0	0.000		0.000		0.000		0.000	
Log likelihood	-1855.93		-1846.40		-1835.78		-1803.22	
Number of observations	2437		2437		2437		2437	

Notes: Standard errors are in parentheses. Statistical significance at the 1%(***), 5%(**), and 10%(*) levels is marked

Table 5c: Bivariate Probit Coefficient Estimates for the Probabilities of Working and Attending School, Girls, 6-14, Exclusive Work, Egypt, 1998.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
currently working		-2.737 ***		-2.730 *	-	-2.689 **	-	-3.199 ***
		(0.896)		(1.423)	-	(1.251)	-	(0.216)
age	0.273	0.547 ***	0.248	0.572 ***	0.356	0.578 ***	0.314	0.583 ***
	(0.366)	(0.172)	(0.443)	(0.180)	(0.421)	(0.171)	(0.254)	(0.153)
age squared/100	-0.588	-2.859 ***	-0.496	-2.983 ***	-0.990	-3.026 ***	-0.897	-3.041 ***
	(1.776)	(0.845)	(2.174)	(0.906)	(2.037)	(0.852)	(1.184)	(0.745)
not son or daughter of	-0.454	-0.019	-0.791 ***	0.089	-0.893 ***	0.062	-1.447 ***	-0.068
household head	(0.367)	(0.171)	(0.299)	(0.188)	(0.254)	(0.190)	(0.461)	(0.295)
father's age when age 6	-0.002	-0.002	0.001	0.002	-0.004	0.002	-0.013	-0.008
	(0.008)	(0.005)	(0.016)	(0.010)	(0.014)	(0.010)	(0.012)	(0.010)
difference btw father's &	-0.007	0.009	-0.005	0.005	-0.001	0.007	0.009	0.015
mother's age	(0.017)	(0.013)	(0.021)	(0.015)	(0.020)	(0.015)	(0.019)	(0.014)
father absent	-	-	0.118	0.374	-0.405	0.706 *	-0.500	0.233
	-	-	(0.603)	(0.385)	(0.680)	(0.411)	(0.484)	(0.382)
father absent temporarily	-	-	-	-0.298	-	-0.276	-	-0.105
	-	-	-	(0.317)	-	(0.316)	-	(0.360)
mother absent	-	-	0.820 *	-0.812 **	0.705	-0.792 **	1.115 **	-0.729 **
	-	-	(0.472)	(0.321)	(0.440)	(0.312)	(0.450)	(0.293)
step mother present	-	-	-0.612	0.686	-0.680	0.703	-1.412 *	0.869
	-	-	(0.898)	(0.731)	(0.918)	(0.715)	(0.757)	(0.804)
father's years of schooling	-0.033	0.055 ***	-0.033	0.058 ***	-0.033	0.057 ***	-0.043 *	0.065 ***
	(0.028)	(0.017)	(0.029)	(0.017)	(0.031)	(0.018)	(0.026)	(0.017)

Table 5c: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
mother's years of schooling	-0.105 ***	0.061 ***	-0.101 ***	0.059 ***	-0.102 ***	0.056 ***	-0.121 ***	0.056 ***
	(0.029)	(0.020)	(0.029)	(0.019)	(0.031)	(0.019)	(0.037)	(0.020)
father is public sector worker	-	-	-	-	-0.645 **	0.468 **	-0.631 **	0.473 **
(if present)	-	-	-	-	(0.322)	(0.201)	(0.310)	(0.194)
father is regular wage worker	-	-	-	-	-0.304	0.393 *	-0.238	0.455 **
(if present)	-	-	-	-	(0.354)	(0.235)	(0.319)	(0.224)
father is non-wage worker	-	-	-	-	-0.907 **	0.457 **	-0.650 *	0.446 ***
(if present)	-	-	-	-	(0.435)	(0.187)	(0.377)	(0.170)
father has no work	-	-	-	-	-0.015	0.183	0.137	0.171
(if present)	-	-	-	-	(0.323)	(0.229)	(0.314)	(0.207)
urban non-metropolitan	-0.153	0.250	-0.117	0.249	-0.224	0.248	-0.210	0.281 *
	(0.522)	(0.162)	(0.503)	(0.162)	(0.503)	(0.165)	(0.424)	(0.160)
rural	0.022	-0.099	0.030	-0.107	-0.118	-0.044	-0.235	0.043
	(0.598)	(0.229)	(0.678)	(0.244)	(0.679)	(0.245)	(0.508)	(0.232)
HH in 2nd lowest urban quintile	-1.006 **	0.322 *	-0.988 **	0.301	-1.065 **	0.255	-1.117 ***	0.254
	(0.424)	(0.187)	(0.420)	(0.188)	(0.451)	(0.193)	(0.408)	(0.197)
HH in top three urban quintiles	-0.681 *	0.477 **	-0.669	0.476 **	-0.586	0.436 **	-0.759 **	0.371 **
	(0.412)	(0.194)	(0.449)	(0.191)	(0.422)	(0.193)	(0.373)	(0.184)
HH in 2nd lowest rural quintile	-0.567 *	0.538 ***	-0.537	0.545 ***	-0.489	0.467 **	-0.370 *	0.361 **
	(0.308)	(0.168)	(0.397)	(0.204)	(0.358)	(0.207)	(0.218)	(0.168)
HH in top three rural quintiles	-0.728 ***	0.583 ***	-0.717 **	0.596 ***	-0.654 **	0.496 ***	-0.575 **	0.389 ***
	(0.265)	(0.140)	(0.287)	(0.161)	(0.295)	(0.180)	(0.254)	(0.142)
prop female w/secondary sch. & abv.*	0.687	1.622	0.517	1.615	1.068	1.646	1.742	1.179
	(2.106)	(1.036)	(2.119)	(1.055)	(2.057)	(1.034)	(1.580)	(0.925)

Table 5c: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
HH owns non-farm	0.140	-	0.131	-	0.558 *	-	0.509 *	-
enterprise	(0.272)	-	(0.283)	-	(0.326)	-	(0.269)	-
HH owns farm enterprise	0.283	-	0.260	-	0.870 **	-	0.758 ***	
	(0.220)	-	(0.276)	-	(0.370)	-	(0.263)	-
Log adult male agric	1.194 *	-	1.176	-	1.270	-	1.112 *	-
wage in governorate	(0.691)	-	(0.754)	-	(0.824)	-	(0.589)	-
prop female service &	-32.50	-	-27.57	-	-38.06	-	-39.03	-
trade workers in locality	(38.99)	-	(38.79)	-	(40.11)	-	(31.93)	-
prop female agric.	1.732	-	1.897	-	2.452	-	3.239 **	-
workers in locality	(2.473)	-	(2.589)	-	(2.559)	-	(1.515)	-
prop male service & trade	4.704	-	3.974	-	4.484	-	4.997	-
workers in locality	(4.445)	-	(4.606)	-	(4.819)	-	(4.208)	-
prop male agric. workers	2.225	-	2.076	-	2.231	-	2.156 *	-
in locality	(1.411)	-	(1.511)	-	(1.565)	-	(1.237)	-
prop male craft workers	2.747 **	-	2.520	-	2.447 *	-	2.176 *	-
in locality	(1.361)	-	(1.494)	-	(1.432)	-	(1.191)	-
household has access to	0.067	-	0.044	-	0.131	-	0.114	-
piped water	(0.244)	-	(0.275)	-	(0.273)	-	(0.192)	-
number of children 0 to 2	-	-		-	-	-	0.122	-0.224 ***
in hh	-	-		-	-	-	(0.100)	(0.082)
number of children 3 to 5	-	-		-	-	-	0.104	0.002
	-	-		-	-	-	(0.101)	(0.068)
number of boys/girls 6 to	-	-		-	-	-	-0.023	-0.219 ***
9	-	-		-	-	-	(0.109)	(0.073)
number of girls 10 to 14	-	-		-	-	-	-0.004	-0.163 **
	-	-		-	-	-	(0.121)	(0.082)

Table 5c: contd.

Variable name	Model 1		Model 2		Model 3		Model 4	
	work	school	work	school	work	school	work	school
number of boys 10 to 14	-	-	-	-	-	-	0.056	0.015
	-	-	-	-	-	-	(0.089)	(0.093)
number of females 15 to	-	-	-	-	-	-	-0.048	-0.026
17	-	-	-	-	-	-	(0.120)	(0.076)
number of males 15 to 17	-	-	-	-	-	-	0.127	0.012
	-	-	-	-	-	-	(0.126)	(0.100)
number of females 18-59	-	-	-	-	-	-	-0.005	0.185 ***
	-	-	-	-	-	-	(0.105)	(0.062)
number of males 18-59	-	-	-	-	-	-	0.107	0.020
	-	-	-	-	-	-	(0.084)	(0.062)
number of females 60+	-	-	-	-	-	-	-0.459 *	0.412 ***
	-	-	-	-	-	-	(0.242)	(0.136)
number of males 60+	-	-	-	-	-	-	0.714	-0.062
	-	-	-	-	-	-	(0.452)	(0.304)
intercept	-12.40 **	-2.219 **	-12.15 **	-2.478 ***	-13.04 **	-2.811 ***	-11.60 ***	-2.290 ***
	(5.095)	(0.869)	(5.146)	(0.886)	(5.162)	(0.857)	(4.235)	(0.864)
correlation of errors (rho)	0.603		0.608		0.593		1.000	
	(0.496)		(0.831)		(0.716)		(0.000)	
p-value of Wald test of rho=0	0.371		0.592		0.537		0.000	
Log likelihood	-958.87		-952.28		-932.72		-895.99	
Number of observations	2437		2437		2437		2437	

Notes: Standard errors are in parentheses. Statistical significance at the 1%(***), 5%(**), and 10%(*) levels is marked

Table 6a: Marginal Effects on the Marginal and Joint Probabilities of Work and School, Boys - Market Work

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
Probability for reference individual		0.070	0.820	0.817	0.0030	0.067	0.112
Change in probability due to unit change in:*							
age	age	-0.018	0.097	0.092	0.0042	-0.022	-0.074
age squared/100	agesq	0.240	-0.573	-0.572	-0.0010	0.241	0.332
not son of household head	othrel*	0.009	-0.039	-0.038	-0.0011	0.010	0.029
father's age when age 6	fage6	0.000	-0.001	-0.001	0.0000	0.000	0.000
difference between father's and mother's age	fmagedf	0.000	0.001	0.001	0.0001	0.000	-0.001
father absent	fathabs*	0.131	-0.151	-0.162	0.0114	0.120	0.031
father absent temporarily	fabsmmar*	-0.056	0.137	0.138	-0.0014	-0.054	-0.083
mother absent	mothabs*	-0.041	-0.028	-0.025	-0.0030	-0.038	0.066
step mother present	stpmom*	0.397	-0.299	-0.368	0.0685	0.329	-0.029
father's years of schooling	fthyrsch	-0.002	0.009	0.008	0.0003	-0.002	-0.006
mother's years of schooling	mthyrsch	-0.004	0.011	0.011	0.0002	-0.004	-0.007
urban non-metropolitan	urbnmtro*	0.051	0.042	0.012	0.0291	0.022	-0.063
rural	rural*	0.020	0.031	0.021	0.0106	0.009	-0.041
HH in 2nd lowest urban quintile	qwurb2*	-0.028	0.068	0.068	0.0000	-0.028	-0.041
HH in top three urban quintiles	qwurb345*	-0.053	0.108	0.111	-0.0024	-0.050	-0.058
HH in 2nd lowest rural quintile	qwrur2*	0.010	0.052	0.041	0.0107	-0.001	-0.051
HH in top three rural quintiles	qwrur345*	-0.018	0.123	0.107	0.0152	-0.034	-0.089
HH owns non-farm enterprise	nfrmentp*	0.038	0.011	-0.002	0.0136	0.024	-0.036
HH owns farm enterprise	farmentp*	0.172	0.060	-0.068	0.1281	0.044	-0.104
prop male w/secondary sch. & abv.	pmsecabv	-0.006	0.524	0.485	0.0390	-0.045	-0.479
Log adult male agric wage in governorate in 1993	lwag93	0.065	0.011	-0.001	0.0126	0.053	-0.064

Table 6a: contd.

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
prop female service & trade workers in locality	pfsrvtrd	3.075	0.541	-0.050	0.5903	2.485	-3.026
prop female agric. Workers in locality	pfagroc	-0.105	-0.018	0.002	-0.0202	-0.085	0.104
prop male service & trade workers in locality	pmsrvtrd	0.959	0.169	-0.015	0.1840	0.775	-0.943
prop male agric. Workers in locality	pmagroc	0.206	0.036	-0.003	0.0396	0.167	-0.203
prop male craft workers in locality	pmcraft	0.241	0.042	-0.004	0.0463	0.195	-0.238
household has access to piped water	pwater*	-0.034	-0.009	0.002	-0.0109	-0.023	0.033
currently working	work2h*	(no effect)	0.071	0.068	0.0029	-0.003	-0.068

Notes: * 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 whose father and mother are present and have mean years of schooling. He lives in a metropolitan region and belongs to a household in the lowest urban wealth quintile that has no household enterprise. He lives in neighborhood with mean proportion of male service and trade, agricultural, and craft workers, and mean proportion of males with secondary education and above.

Table 6b: Marginal Effects on the Marginal and Joint Probabilities of Work and School, Girls - Inclusive Work

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
Probability for reference individual^		0.496	0.789	0.479	0.310	0.186	0.025
Change in probability due to unit change in:*							
age	age	0.112	0.109	-0.077	0.186	-0.075	-0.036
age squared/100	agesq	-0.042	-0.708	-0.095	-0.613	0.571	0.137
not daughter of household head	othrel*	0.027	0.019	-0.020	0.039	-0.013	-0.006
father's age when age 6	fage6	-0.002	0.000	0.002	-0.002	0.000	0.000
difference between father's and mother's age	fmagedf	0.003	0.003	-0.002	0.005	-0.002	-0.001
father absent	fathabs*	-0.111	0.099	0.117	-0.018	-0.093	-0.006
father absent temporarily	fabsmmar*	-0.021	-0.109	-0.010	-0.099	0.078	0.031
mother absent	mothabs*	0.189	-0.319	-0.222	-0.096	0.285	0.033
step mother present	stpmom*	-0.284	0.123	0.270	-0.147	-0.137	0.014
father's years of schooling	fthyrsch	-0.010	0.020	0.013	0.007	-0.018	-0.002
mother's years of schooling	mthyrsch	-0.005	0.020	0.008	0.012	-0.017	-0.003
urban non-metropolitan	urbnmtro*	0.239	-0.002	-0.220	0.219	0.020	-0.018
rural	rural*	0.210	-0.072	-0.199	0.127	0.084	-0.012
HH in 2nd lowest urban quintile	qwurb2*	0.054	0.056	-0.041	0.097	-0.043	-0.013
HH in top three urban quintiles	qwurb345*	-0.057	0.120	0.071	0.049	-0.105	-0.014
HH in 2nd lowest rural quintile	qwrur2*	-0.038	0.136	0.055	0.080	-0.118	-0.017
HH in top three rural quintiles	qwrur345*	-0.044	0.140	0.062	0.078	-0.123	-0.018
HH owns non-farm enterprise	nfrmentp*	-0.084	0.057	0.084	-0.027	-0.057	0.000
HH owns farm enterprise	farmentp*	-0.032	0.022	0.032	-0.009	-0.022	0.000
prop female w/secondary sch. & abv.	pmsecabv	0.561	0.094	-0.468	0.562	0.000	-0.093
log adult male agric wage in governorate in 1993	lwag93	0.452	-0.328	-0.452	0.124	0.328	0.000

Table 6b: contd.

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
prop female service & trade workers in locality	pfsrvtrd	1.863	-1.352	-1.862	0.511	1.353	-0.001
prop female agric. Workers in locality	pfagroc	-0.320	0.232	0.320	-0.088	-0.233	0.000
prop male service & trade workers in locality	pmsrvtrd	1.510	-1.095	-1.509	0.414	1.096	-0.001
prop male agric. workers in locality	pmagroc	0.921	-0.668	-0.920	0.252	0.669	-0.001
prop male craft workers in locality	pmcraft	0.998	-0.724	-0.998	0.274	0.725	-0.001
household has access to piped water	pwater*	-0.243	0.198	0.242	-0.045	-0.198	0.001
currently working	work2h*	(no effect)	-0.620	-0.434	-0.186	0.186	0.434

Notes: * Based on marginal change for continuous variables and change from 0 to 1 for dummy variables. ^ The reference individual is a 14 year old girl whose father and mother are present and have mean years of schooling. She lives in a metropolitan region and belongs to a household in the lowest urban wealth quintile that has no household enterprise. She lives in neighborhood with mean proportion of male service and trade, agricultural, and craft.

Table 6c: Marginal Effects on the Marginal and Joint Probabilities of Work and School, Girls - Exclusive Work

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
Probability for reference individual		0.034	0.774	0.765	0.009	0.025	0.201
Change in probability due to unit change in:*							
age	age	0.019	0.148	0.138	0.011	0.009	-0.157
age squared/100	agesq	-0.040	-0.823	-0.777	-0.046	0.006	0.817
not daughter of household head	othrel*	-0.029	0.046	0.052	-0.006	-0.023	-0.023
father's age when age 6	fage6	0.000	0.001	0.000	0.000	0.000	-0.001
difference between father's and mother's age	fmagedf	0.000	0.002	0.002	0.000	0.000	-0.002
father absent	fathabs*	0.010	0.057	0.051	0.006	0.004	-0.061
father absent temporarily	fabsmmar*	--	--	--	--	--	--
mother absent	mothabs*	0.126	-0.364	-0.359	-0.005	0.132	0.233
step mother present	stpmom*	-0.027	0.147	0.151	-0.004	-0.023	-0.124
father's years of schooling	fthyrsch	-0.003	0.019	0.019	0.000	-0.003	-0.016
mother's years of schooling	mthyrsch	-0.008	0.024	0.024	0.000	-0.007	-0.017
urban non-metropolitan	urbnmtro*	-0.008	0.071	0.069	0.002	-0.009	-0.061
rural	rural*	0.001	-0.033	-0.032	-0.001	0.002	0.031
HH in 2nd lowest urban quintile	qwurb2*	-0.031	0.100	0.107	-0.007	-0.024	-0.076
HH in top three urban quintiles	qwurb345*	-0.028	0.128	0.133	-0.005	-0.023	-0.105
HH in 2nd lowest rural quintile	qwrur2*	-0.025	0.138	0.141	-0.003	-0.022	-0.116
HH in top three rural quintiles	qwrur345*	-0.028	0.148	0.152	-0.005	-0.024	-0.124
HH owns non-farm enterprise	nfrmentp*	0.011	-0.009	-0.011	0.002	0.009	0.000
HH owns farm enterprise	farmentp*	0.024	-0.021	-0.024	0.003	0.021	0.000
prop female w/secondary sch. & abv.	pmsecabv	0.041	0.439	0.411	0.028	0.013	-0.452

Table 6c: contd.

Variable name	variable	W=1	S=1	S=1 & W=0	S=1, W=1	S=0 & W=1	S=0 & W=0
Log adult male agric wage in governorate in 1993	lwag93	0.088	-0.073	-0.087	0.014	0.074	0.000
prop female service & trade workers in locality	pfsrvtrd	-2.084	1.748	2.076	-0.328	-1.756	0.009
prop female agric. Workers in locality	pfagroc	0.146	-0.123	-0.146	0.023	0.123	-0.001
prop male service & trade workers in locality	pmsrvtrd	0.298	-0.250	-0.297	0.047	0.251	-0.001
prop male agric. Workers in locality	pmagroc	0.157	-0.132	-0.157	0.025	0.133	-0.001
prop male craft workers in locality	pmcraft	0.192	-0.161	-0.192	0.030	0.162	-0.001
household has access to piped water	pwater*	0.003	-0.002	-0.003	0.000	0.002	0.000
currently working	work2h*	(no effect)	-0.773	-0.748	-0.025	0.025	0.748

Notes: * Based on marginal change for continuous variables and change from 0 to 1 for dummy variables. ^ The reference individual is a 14 year old girl whose father and mother are present and have mean years of schooling. She lives in a metropolitan region and belongs to a household in the lowest urban wealth quintile that has no household enterprise. She lives in neighborhood with mean proportion of male service and trade, agricultural, and craft.