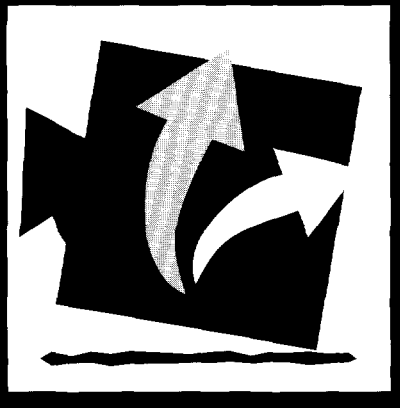
Public Disclosure Authorized

Public Disclosure Authorized

SP DISCUSSION PAPER NO. 0024

23144



Do Market Wages Influence Child Labor and Child Schooling?

Jackline Wahba

December 2000

Social Protection
LABOR MARKETS, PENSIONS, SOCIAL ASSISTANCE
THE WORLD BANK

DO MARKET WAGES INFLUENCE CHILD LABOR AND CHILD SCHOOLING?

Jackline Wahba

Department of Economics
University of Southampton,
Southampton, SO17 1BJ
United Kingdom
Email: jew3@soton.ac.uk

December 2000

Abstract

This paper provides empirical evidence on the joint determinants of child labor and child schooling using individual level data from Egypt. The main findings are as follows: (i) A 10% increase in the illiterate male market wage decreases the probability of child labor by 21.5% for boys and 13.1% for girls. (ii) Higher local regional income inequality increases the likelihood of child labor. (iii) Parents who were child laborers themselves are more likely to send their children out to work. (vi) Local labor market conditions- the share of adults engaged in the public sector or in non-regular jobs- play an important role in influencing child labor participation. (iv) There is a trade-off between child labor and child schooling. The results suggest that not only is poverty the main cause of child labor, but that child labor perpetuates poverty as well.

Keywords: child labor, schooling, developing countries, wages, poverty.

JEL: I20, I30, J13, J20, O15.

Foreword

This is an important paper and one of the first econometric studies of child labor in the Middle East and North Africa Region where data availability often poses a constraint in analyzing labor market outcomes and household behavior. The author uses individual data from Egypt and finds that adult wages have a strong negative influence on the probability of child labor but there are significant gender differences which depend on whether, first, it is the father's or mother's wage that changes and, second, whether the child worker is female of male. Higher local income inequality in a province/region increases the likelihood of child labor while parents who were child laborers themselves are more likely to send their children out to work. Thus, not only is poverty the main cause of child labor, but child labor itself contributes to the perpetuation of poverty. While the paper explores a series of effects, one worth mentioning is that there seems to be a trade off between child labor and child schooling. Three implications of the paper are the following. First, policies aimed at alleviating poverty and reducing income inequality are crucial in tackling child labor and breaking the cycle of poverty transmission from one generation to the next. Second, policies need to take into account gender differences in patterns of child labor and effects of interventions. Third, improving adult employment, in particular creating more formal sector jobs, seems to facilitate the reduction of child labor.

Zafiris Tzannatos
Leader
Global Child Labor Program

Do Market Wages Influence Child Labor and Child Schooling?[1]

The most recent estimates by the World Bank and the International Labor Organisation indicate that there are about 250 million children, less than 14 years old, working world-wide.[2] Many of these children work long hours under hazardous conditions, and all of them are very low paid. The current unprecedented public concern for the prevalence of child labor has brought broad consensus on the need to eliminate child labor by international organisations such as the ILO and the World Bank.[3] However, there is a wide disagreement on the best way to achieve that, and on whether banning child labor is likely to be effective in eradicating this phenomenon- see for example, Siddiqi and Patrinos (1995). A recent notable theoretical paper by Basu and Van (1998) shows that a ban on child labor can worsen the conditions of households in very poor countries where households rely on child income for their survival. Their model is based on the assumption that household will only send its children to work if its income from non-child labor is very low - the luxury axiom. Unfortunately, empirical evidence has consistently failed to demonstrate a strong relationship between household poverty and child labor - for most recent examples, see Ray (2000), (1999) and Nielsen (1998).

The aim of this paper is to test and further understand the determinants of child labor and especially, the influence of low market wages. The paper provides empirical evidence on the impact of low *market* adult and child wages on child labor using an *individual* level data set, and also allowing for two new contributions to the child labor literature: the impact of *local regional* income (non-labor) inequality on child labor, and the influence of having parents who were child laborers themselves- the inter-generational transmission of poverty through the experience of child labor.

Basu & Van (1998) assume that parents send their children to work only if they are poverty stricken; they take for granted parental altruism towards the child. Thus, in their model, poverty, or low adult wage, is the main reason for sending children to work– the

[1] I am grateful to Barry McCormick for helpful comments and suggestions. I would also like to thank Sally Srinivasan, Yves Zenou and participants at ESRC DESG Annual Conference, Reading, July 1999.

[2] See Fallon and Tzannatos (1998). Basu (1999) provides a summary of participation rates for children under 15 years old in selected LDCs.

[3] See ILO(1997) and Fallon and Tzannatos (1998).

luxury axiom. In addition, they also assume in productive activity, adult labor and child labor are substitutes- the substitution axiom. They conclude that if a labor market is characterised by more than one equilibrium – one in which adult wages are low and children work, and another where adult wages are high and children do not work- banning child labor is a benign policy. But, in very poor countries, where there is only one labor market equilibrium at which adult wages are low, banning child labor can worsen the households' welfare. Hence, they argue that promoting adult employment is the first best policy to eliminate child labor.

The notion that wages, both adult and child, affect the supply of, and the demand for, child labor is not new. Earlier studies which examine the influence of adult and children wages on labor market participation rates of children [4] - such as Rosenzweig & Evenson (1977), Rosenzweig (1981), Levy (1985), and Skoufias (1994) - use regional aggregate data and focus on the determinants of the number of children (fertility rate) as well as their quality (school participation rate and labor force participation rate) at the rural district or village level.[5] However, evidence from these studies which use aggregate data is inconclusive. Rosenzweig & Evenson (1977) using district level data from rural India in the 1960s, find that both adult male and female wages have negative significant impact on boys and girls working. On the other, Skoufias (1994) using data from rural India as well but for the 1970s, find that adult wages do not have a significant influence on the probability of child participation in either the labor market or schooling. Levy (1985) using data from rural Egypt, though not distinguishing between boys and girls, shows that higher adult male wages have positive significant effect on child labor, while adult female wages have negative one.[6]

Recent studies using micro data sets- for example, Jensen & Nielsen (1997), Nielsen (1998), Patrinos and Psacharopoulos (1997), Grootaert (1998), and Canagarajah and Coulombe (1997) and Ray (1999)- do not examine the effect of adult market wages on child

[4] Bhalotra & Heady(1998) use child market wages to explain hours of child work in rural Pakistan and Ghana.
[5] Early analysis of child labor - for example, Rosenzweig & Evenson (1977), Rosenzweig (1981), Levy (1985)- focuses on the economic role & contribution of children by modelling household behaviour. These models of time allocation within the household explain simultaneously family size (fertility), school enrolment and child labor. Rosenzweig & Evenson (1977) provide the basic model in this literature analysing the joint family decision regarding the number of children and children's time allocated to schooling and work and show that Indian families have many children as a result of the high return to the use of child labor.
[6] Diamond & Fayed (1998) using a flexible form production function show that adult male labor is complement to child labor, while adult female labor is substitute to child labor in Egypt.

labor, though they study the impact of household poverty on child labor.[7] Yet, the results of the individual level data are mixed as well. Ray (1999) tests the luxury axiom, of Basu and Van, on Peru & Pakistan by examining the relationship between child labor hours and household poverty. He studies the likelihood of poor households (those earning below the poverty line) sending their children to work, and finds mixed evidence; a positive significant relationship between household poverty and child labor in the case of Pakistan, but not in the case of Peru. In addition, Nielsen (1998) finds that in the case of Zambia, poverty and low income have very small effect on the probability of child labor, and she concludes that poverty is not the main cause of child labor in Zambia. Canagarajah & Coulombe (1997) also find that household welfare has a weak effect on the probability of child labor, but in Ghana. Thus, the first focus of this paper is to provide further empirical evidence using individual level data on the impact of poverty on the probability of child labor, but also using market wages (adults and child).

The second focus is to study the influence of unequal regional income distribution which Swinnerton & Rogers (1999) hypothesise to be an important determinant of child labor. Swinnerton & Rogers (1999) extend the model by Basu & Van and show that child labor would also exist if *non-labor* income were not equally distributed among households – the distribution axiom. They argue that more equal income distribution would reduce child labor. Recent econometric work tend to study the impact of household poverty on child labor by using welfare index - per capita expenditure- or more commonly the size of household landholding[8]; no attempts have been made to capture the impact of regional income inequality. This paper examines the influence of being in a province/region where income (non-labor) is unequally distributed on the probability of child participating in the labor force using regional Gini coefficient as a measure of inequality.

---

[7] Although one would like to study the effect of household income on the probability of child labor, one can argue that household income, in this case, is endogenous, i.e. household income is affected by child labor; how much the other members of the household work and earn is affected by whether children are working or not. This is why studies tend to use household consumption or expenditure instead of household income. Unfortunately, we don't have any data on consumption or expenditure. Hence, this is a limitation in our analysis, though we examine the effect of market wages, inequality, and whether the parents were child laborers themselves, all of which can be interpreted loosely as measures of income.

The third focus of the paper is to investigate in a new way the transmission of poverty, or low income, from parents to children. There is no empirical evidence on how child labor perpetuates poverty from one generation to another, or on how parents who were child laborers are more likely to have their children work as well. One might argue that parents who worked as children are more likely to have under-invested in schooling and become poverty trapped and hence would expect their children to work as well. The relationship between family background, such as race, ethnic origin, religion and in particular education, and child labor is fairly established in the empirical literature.[9] Studies show that low level of parents' educational attainment is an important factor in increasing the likelihood of children working. However, the effect of the parents being child laborers themselves has not been explored in the literature previously. In this paper, the inter-generational transmission of low incomes or poverty is explored by testing whether parents who themselves worked as child laborers are more likely to send their children out to work or not.

Although Basu & Van (1998) do not model school participation, in many cases, schooling and employment for children are not mutually exclusive. Many children work and attend school. In fact, many children have to work to go to school; otherwise they could not afford to go to school. This underscores the fact that child labor and schooling may work together in many cases.[10] In many developing countries, due to limited financial resources mainly school buildings, public schools operate two or three shifts schedule school day (4 hours each approximately). Thus, in a way the educational system seems to accommodate for the dual activities of children.[11] Thus, this paper explores the joint determination of child labor and child schooling and will assume that these two decisions facing a child – whether to work or to study- are two interdependent choices. The paper uses a unique data set from

---

[8] Lack of data on household expenditure or landholdings prevent including these measures of household poverty as well in this paper.

[9] See Grootaert and Knabur (1995) for a review of this literature.

[10] The fact that children may be working and going to school at the same time may affect their educational attainment is beyond the scope of this study, but is important.

[11] Many educational systems in LDCs are organised into shifts, for example, Bangladesh - Ravallion nad Wodon (2000), Peru - Patrinos & Pscaharopoulos (1997) and Egypt - Hanushek & Levy (1993).

Egypt that is nationally representative and covers 10,000 households and more than 10,000 children.

The plan of the paper is as follows. Section 2 describes the characteristics of child labor in Egypt. Section 3 presents the econometric model used. The main determinants of child labor and school participation are reported in Section 4. The main findings are summarised in the Conclusion.

2. The Data

This study uses individual level data from the 1988 Labor Force Sample Survey carried out by the Central Agency for Public Mobilisation and Statistics (CAPMAS) in Egypt. The October 1988 round of the LFSS is a nationally representative survey covering 10,000 households. The survey collected detailed information on employment and socio-economic characteristics of individuals 6 years of age or more. It also included a set of questions on child labor.[12] The analysis is based on 10742 children aged between 6-14 years old for whom full information on schooling, labor participation & parents characteristics are available.

A child is classified as a worker or economically active, by the International Labor Organisation (ILO), if the child is remunerated for that work, or if the output of this work is destined for the market.[13] This definition is also adopted here. Hence a child is considered to be working whether he/she is being paid for work or is working for his/her family and is unpaid for that work. The survey uses the previous year as its reference period. There is no data on household chores activities carried out by those children.

Egyptian labor law stipulates a minimum age for employment of 12. However, this legislation does not apply to family businesses, domestic work or agriculture. On the other hand, in Egypt as in many other developing countries - such as Sri Lanka, Thailand, Costa Rica[14] - the minimum working age is lower than the required age of compulsory education which is 15 years.

[12] See El Deib (1994) for detailed discussion of the child labor module.
[13] See Basu (1999) for a detailed discussion.
[14] Siddiqi and Patrinos (1995).

Table 1a presents the descriptive statistics of the sample of children between 6-14 years old. The first column provides the characteristics of all children in the sample. Columns 2 & 3 show the characteristics of school participants and non-school participants. First, the school non-participation rate is 17.5% for the total sample of 6-14 years old. Almost two thirds of school non-participants are girls. Although, 60 % of children in the sample are rural residents, 83.5 % of children who are school non-participants are rural children. In addition, the majority of school non-goers tend to come from families where the parents have no, or very little, education. About 40 % of children who are not engaged in schooling have dropped-out of school. Another interesting difference between children who are enrolled in schooling and those who are not, is that only 13.9% of children who are not attending schools have at least one overseas return migrants in their household compared to 17.8% among children who are attending school.

Columns 4 – 7, in Table 1a, display the characteristics of working and non-working children. A distinction is made between children who are paid and those who work for the family and are unpaid laborers though their output is destined for the market- columns 5 & 6. Column 4 shows that 42 % of all working children are less than 12 years old - 6-11 years old- , and that, 61 % of all working children are boys. Three-quarters of working children are engaged in agriculture. Around 30 % of working children are waged workers.[15] Parents of children who are not working are on average more educated than those of working children. 16.6% of children in female headed households are working for wage, while only 10.93 % work for non-wage. More than half (58%) of the working children come from families where the fathers were child laborers and 42% where the mothers were child laborers. Although 32 % of the fathers of the sampled children are employed in the Public Sector, only 17 % of the fathers of working children are employed in the public sector.

More than half the working children (57%) are also attending school[16] - Table 1b. On average, children work 5.28 hours per day and 57% of working children reported working 7

[15] In developing countries where agriculture is a major sector, the majority of working children tend to work in subsistence agriculture as unpaid family workers. For example, more than 90 % of the working children are wage workers in most sub-Saharan African countries- see Canagarajah & Coulombe (1997).

[16] In Ghana, for example, 19 % of the total number of children work & study; 66% of children who were working were also going to school; see Canagarajah & Coulombe (1997).

days a week.[17] Table 1c presents the child labor and schooling participation pattern of children by gender, rural/urban region and age groups. First, 7.93 % of children are not engaged in neither market work nor in attending schooling. This group is comprised mainly of girls (83 %) who are most probably involved in household chores. Secondly, 10.63% of all children in the 6-14 years old cohort combine working and studying. Work and study combination is more common among boys, among 12-14 years old and in rural areas. The proportion of boys who tend to combine working and studying is greater than the proportion who only works. The majority of children in urban areas are enrolled in schooling and only 3.29% work and do not go to school. Many Egyptian public schools operate up to three shift schedule (4 hours each approximately) a day - morning, afternoons and early evenings - mainly due to government resource constraints. Thus, in a way the Egyptian educational system seems to accommodate for the dual activities of children. Thus, in the Egyptian context, it seems appropriate to examine the joint determinants of both attending school and working.

3. The Econometric Model

This paper aims to explore the main determinants of child labor and child schooling in a reduced form model by focusing on the influence of market wages, local income distribution and perpetuation of inter-generational poverty. The estimation method used here reflects the decision making process. Schooling and work are not treated as two independent decisions nor as a sequential process.[18] It is assumed that these two decisions are interdependent and a bivarite probit model is used because it allows for the existence of possible correlated disturbances between two decisions. Bivarite probit models also allow us to test for the existence and significance of the interdependence of these joint decisions.

[17] Data on children's working hours and working days are only available for 1377 children and not for the total sample of working children (N=1988).

[18] Canagarajah and Coulombe (1997) and Nielsen (1998 also use bivarite probits. Different estimation techniques, of the determinants of the probability of child working and the probability of child schooling, are used in recent studies to capture the decision making process: Patrinos and Psacharopoulos (1997) and Jensen & Nielsen (1997) assume that the two decisions are independent and therefore use logit models; Grootaert (1998) uses a sequential binary probit model where a certain hierarchy of choices is assumed to capture a sequential decision making process.

Let z_{i1} represent the decision of working and z_{i2} the decision of schooling.

The general specification of a two-equation model would be

$$z_{i1} = \beta_1' x_{i1} + \varepsilon_{i1}, \quad y_{i1} = 1 \text{ if } z_{i1} > 0, \; y_{i1} = 0 \quad \text{otherwise}$$

$$z_{i2} = \beta_1' x_{i2} + \varepsilon_{i2}, \quad y_{i2} = 1 \text{ if } z_{i2} > 0, \; y_{i2} = 0 \quad \text{otherwise}$$

$$E[\varepsilon_{i1}] = E[\varepsilon_{i2}] = 0$$

$$Var[\varepsilon_{i1}] = Var[\varepsilon_{i2}] = 1$$

$$Cov[\varepsilon_{i1}, \varepsilon_{i2}] = \rho$$

where ρ is the coefficient of correlation between the two equations. The first dependent variable is defined 1 if the child is economically active in the labor market and 0 otherwise. The second dependent variable is defined 1 if the child participates in schooling and 0 otherwise. x_{i1} and x_{i2} are the explanatory variables explaining the probability of working and the probability of attending schooling respectively. In what follows, these explanatory variables are examined.

3.1 Market Wages

One of the primary aims of this paper is to test for whether there is a negative relationship between adult wages and child labor as conjectured by Basu & Van (1998). According to their model, higher adult wage would lead to higher supply of adult labor, and lower supply of child labor. They assume that because firms perceive adults and children as substitutes- i.e. substitution axiom-, higher adult wages would lead to lower demand for adult labor and higher demand for child labor. But, because parents are altruistic, they only send out their children to work if they are impoverished- have low non-child-labor income. In

equilibrium, because of the luxury axiom, child labor would be less. However, if their substitution axiom is relaxed and adults and children are complements, higher adult wages would in turn lead to lower demand for adults and for children. Hence, child labor would also fall. Thus, theoretically, as long as the luxury axiom holds, higher adult wages would lead to lower child participation in the labor market.

Both adult male and female wages are used to capture the different impact each may have on child labor and schooling. Since it is hypothesised by Basu & Van (1998) that adults and children are substitutes from the firm's point of view, it could be argued that this may be the case in particular for adults with no education. In other words, that illiterate adults and children are substitutes.[19] Thus, adult market hourly wages of *illiterate* male and female by rural and urban area in every province relative to the national average are used.

Child market hourly wage by rural and urban area in every province relative to the national average is also included. Child market wage is an important determinant of child labor.[20] Even when children are unpaid family workers, high child wages would make it expensive for households to employ children from outside the household, thus requiring their own children to work.[21] On the other hand, the effect of child market wage on the probability of child participating in schooling is an indirect one because it is the opportunity cost of not working.

3.2 Local Income Inequality:

The second aim of this paper is to test empirically for the role of local income distribution on the likelihood of child labor. According to Swinnerton & Rogers (1999) inequality in income distribution contributes to child labor. Thus, one might expect that the probability of child working is higher in provinces or regions where income is unequally distributed. To test this hypothesis, "Gini" coefficient is used as a measure of income inequality by province.

---

[19] Even if adult males and child labor are complements (for example, Levy (1985)) rather than substitutes, using the wage of illiterates is still appropriate.

[20] Though it is not always statistically significant. See, for example, Soukfias (1994) & Rosenzweig (1981).

[21] If the proportion of children working for wage is small, then it may be argued that child wage does not measure the opportunity cost of children's time. Nonetheless, child wage would capture the opportunity cost of hiring paid work for the family, if unpaid child work had not been available.

3.3 Inter-Generational Transmission of Poverty

The third focus of this paper is to explore the inter-generational transmission of poverty or low income. The impact of the parents being child laborers themselves on the probability of child labor is studied by including two dummies, one for each parent. One possible hypothesis is that poverty is perpetuated through child labor. So, a parent who has been raised in poor family where he/she had to work as child himself/herself which constrained him/her ability to invest in schooling and condemned him/her to low wage or poverty as an adult, will tend to send his/her children to work in turn. On the other hand, it may be that if the parents were child laborers themselves and had to feel the brunt of child labor or felt disadvantaged as result of working at an early age, they may be less likely to send their children to work.

3.3 Child's Characteristics:

Gender and age are important determinants of the probability of schooling and work- see for example, Chernichovsky (1985). Almost all studies find that males are more likely to be *economically* active in the labor market. However, the effect of gender on schooling is more country–specific and cultural dependent. Moreover, studies tend to find that older children are usually likely to participate in the labor market and less likely to attend schooling.[22] Thus, gender - male dummy- and age are used as explanatory variables.

3.4 Parents' Characteristics:

Previous empirical studies find ample evidence that parents' education affects child labor and school participation decisions- see for example, Psacharopoulos & Arriagada (1989), and Grootaert (1998). Some studies - such as Handa (1996)- find that father's education affects boys the most and mother's education affects girls the most, while others - like Canagarajah & Coulombe (1997)- find that fathers' education affects the likelihood of working, and mother's education influences only the schooling participation. Thus, to capture the effect of parents' education four educational dummies are used for each parent: no education (which is the reference group), less than primary, primary, and more than primary education. Also, the nature of the parents' employment affects the child labor decision. A

[22] See Grootaert & Kanbur (1995).

dummy variable indicating whether the father is employed in the Public sector is included to capture the impact of father having a stable regular job.

3.5 Household's Characteristics:

The gender of the head of household is another potentially important determinant of child labor and schooling. On one hand, female–headed households usually have higher dependency ratio which may increase the likelihood of sending children out to work. However, female-headed household may tend to be more rational in intra-household resource allocation pattern and invest in schooling of their children- see for example, Canagarajah & Coulombe (1997). So a dummy for female headed household is used. Also, the presence and number of younger siblings in the household may affect the probability of school and work participation. The more siblings, the more likely that a child will need to work to generate income and less likely that a child will go to school. Girls, particularly, are likely to be called upon to help with looking after the younger siblings. The number of children less than six years old is used.

Since in the 70s and 80s, Egypt witnessed a huge flow of overseas labor migration on temporary basis, it seems interesting to control for the presence of any return migrants in the household who might affect the decisions of child labor and schooling. On the one hand, it may be the case that return migrants are less credit constrained if they have acquired overseas savings[23] or they might value investing in education having worked overseas and therefore would have a positive impact on child schooling and negative influence on child working.

3.6 Demand Side & Regional Characteristics:

Trying to capture the factors that affect demand for children employment, the following variables are used. The first variable is the percentage of adult workers engaged in manufacturing, in the rural or urban area, in the province.[24] The higher the share of adults in manufacturing, the less would be the demand for children labor. Secondly, the share of adult workers employed in Public Sector in the rural/urban area in the province is included. The

[23] Although there are data on whether a household has a return migrant or not, there are no data on whether the return migrant had accumulated any overseas savings.

more public sector jobs in a province, the lower will be the demand for children employment. This is because public sector does not hire individuals less than 15 years old; and second it may reflect the fact that the labor market is more formalised. Finally, the percent of adults in non-regular – casual and seasonal - employment in the rural/urban area of the province is also used. The more non-regular employment in a provincial labor market, the more would be the demand for children work in that market. This variable can also capture the degree of informality. Children in urban areas tend to work mainly in the informal sector where labor market regulations are not enforced. In addition, regional dummies of residence of the household: Greater Cairo (reference group), Alexandria and Canal Cities, Lower Urban Upper Urban, Lower Rural and Upper Rural are used to control for the different demand patterns of labor markets in the labor force participation decision.

One of the limitations of the data set used in this paper is that it does not include any information on variables that may affect the demand for schooling, for example, school availability, accessibility (distance to school), quality of schooling, cost of schooling[25], among others. Previous studies - for example, Bonnet (1993) and Hanushek & Levy (1993)- point to the importance of school accessibility and school quality in determining the schooling participation decision.[26] Thus, regional dummies are used to control for school availability and quality in the school participation equation. One would expect that in rural areas because of poor schooling facilities, children would be less likely to attend school compared to in urban areas. In addition, children in the poorer rural areas - the south (Upper Rural Egypt) - are expected to have lower probability of going to school compared to children in other rural areas - in the north (Lower Rural Egypt).

4. Empirical Findings

---

[24] There are 26 governorates or provinces in Egypt and six geographical regions. All governorates are comprised of urban and rural areas -except for 4 governorates (Greater Cairo, Giza, Alexandria, and Canal Cities) which are only urban.

[25] Although education is free, parents have to pay for other direct costs like uniform and books as well as tuition which is fairly common in Egypt – see Hanushek & Levy (1993) for a discussion on the private cost of education in Egypt.

[26] Bonnet (1993) argues that schooling problems - such as the inaccessibility of schools or the lack of quality education- contribute to child labor. Hanushek & Levy (1993) find that school quality is one of the main reasons behind children dropping out of school in Egypt.

The bivarite probit results of the determinants of child labor force participation and schooling participation decisions are shown in Tables 2 and 3. Marginal effects are reported; they show the increment in the probability relative to the sample mean, corresponding to the particular characteristic, relative to the reference group. Table 2 presents the results at the national level for both urban and rural areas, while Table 3 displays the results for rural areas only to enable a comparison with earlier studies. Separate estimates for boys and girls are given since the factors influencing child labor and child schooling may have different magnitude or impact that is gender specific. Also, to test for the robustness of the results in the case of *paid* child work, the results for the determinants of paid child labor and child schooling are displayed in Table 4.

First, the impact of market wages is examined. Tables 2 and 3 show a strong negative relationship between adult illiterate male and female market wages and child participation in the labor market. The higher the adult male and female provincial wages relative to the national average, the lower is the probability of child labor. It is also interesting to note that this negative relationship exists for both boys and girls. In addition, this negative relationship between adult market wages and child labor are also seen in rural areas. This partly contradicts earlier evidence by Levy (1985) who finds positive relationship between male wages and child labor, but a negative relationship between female market wages and labor force participation rates of children in rural Egypt. One possible explanation is that although males and children are complements as he argues, illiterate males and children are substitutes. Thus, the empirical findings support Basu & Van's (1998) luxury hypothesis. In addition, the findings also indicate that the higher is the child market wage, the more likely a child will work.

The influence of adult illiterate male market wage on the probability of schooling is not only positive and significant, but also has bigger impact than the adult illiterate female market wage. The higher the provincial male market wage relative to the national average, the more are the odds of child attending schooling. Adult illiterate female market wages have positive, but smaller compared to adult male market wage, impact on the likelihood of school participation of boys. However, adult female market wage has negative impact on the schooling decision of girls. The higher the adult female wage, the lower is the probability of

female school participation. One explanation is that higher female adult wages increases female labor market participation outside the household, which in turn may mean that daughters are needed at home to do household chores instead of the mother. The child market wage does not seem to have significant effect on the child schooling decision, though it has the expected negative impact suggesting that the higher the child market wage, the greater is the opportunity cost of attending schooling.[27] In the case of girls, though, it appears that the opportunity cost of their schooling is not their own forgone wages, but those of their mothers (adult females).

Table 5b summarises the influence of adult market wages on the probability of child participation in the labor force by gender and region. It displays the changes in the predicted probability of child labor - given in Table 5a Column 2- as a result of a 1 % change in the provincial adult market wage relative to the national average. A 10% increase in the male illiterate market wage decreases the probability of child labor by 21.5% for boys and 13.1% for girls, while, a similar rise in female illiterate wage rate, lowers the probability of child participation in the labor market by 18.5% for boys and 4.3% for girls. In rural areas, a 10% increase in female illiterate wage, decreases the likelihood of child labor by 19.0% for boys and 7.2% for girls.[28] To sum up, adult illiterate market wages seem to (i) have strong negative influence on the probability of both, paid and unpaid, child work, (ii) have greater impact in rural areas than in urban areas, (iii) have smaller absolute effect on the probability of school participation than on child labor. Low wages seem to be the key determinants of child labor.

Turning to the second focus of the paper, the effect of income inequality, the results indicate that living in a province where there is greater local income inequality raises the probability of child labor. This finding is robust in both urban and rural areas, and for both genders. Thus, the Egyptian evidence supports the "distribution hypothesis" by Swinnerton

[27] Levy (1985) also finds that wage-child effect has the right sign but is not significant.

[28] Levy (1985) finds that a 10% increase in female market wage rates reduces employment of children by 27% for 6-11 years old and by 15% for 12-14 years old, in rural Egypt. However, he finds that an increase in male wage rates *increases* employment of children, though he does not report the elasticity. Rosenzweig (1981) finds that in rural India, a 10% increase in male wages reduces boys' labor supply by 10%, but have no effect on girls, while a 10% increase in female wages decreases girls' participation in the labor market by 9-10 %, but have no effect on boys' employment.

and Rogers (1999) of the existence of a positive relationship between income inequality and child labor.

The third main finding of the paper is that having a parent who was child laborer himself/herself increases the probability of the child working. In addition, the effect of the mother being child laborer is twice as much of that of the father in both rural and urban areas as well as for girls and boys. This seems to suggest another channel whereby impoverishment is transmitted from parents to children; child labor perpetuates poverty. However, having a parent who worked as a child laborer himself/herself does not affect significantly the likelihood of child participation in schooling.

Gender seems to be an important determinant of both child labor and schooling. Being a boy increases both the probability of participation in both the labor market and in schooling. Being a boy increases the likelihood of working in rural areas by 6%. However, being a boy has smaller impact on school participation in urban areas, while in rural areas it increases the likelihood of schooling by 6%. Age also affects the likelihood of child labor and schooling. Being older increases the probability of participating in the labor force and decreases that of attending schooling.

Parents' characteristics play an important role in influencing the working and schooling decisions of children. Having a father who is employed in the Public sector increases the probability of the child attending school and decreases that of working. Moreover, having less educated parents increase the likelihood of child labor and decreases that of investing in schooling. As found in earlier studies father's education affect boys more than mother's education which affects girls more.

Household characteristics affect the determinants of child labor and schooling. Living in a household where the head is female does not affect the probability of participating in the labor market, but it increases the likelihood of investing in schooling. Having younger siblings at the household increases the odds of child labor and decreases that of schooling. The presence of return overseas migrants at the household has negative (though not always significant) effect on the likelihood of child work. However, having a return overseas migrant has positive impact on the schooling decision. This would suggest that return migrants tend to invest in education.

The characteristics of the local labor market seem to have more impact on the probability of child labor in rural areas than in urban ones. Though local labor market characteristics affect the probability of *paid* child labor in both urban and rural areas. Thus, the higher the share of adults engaged in manufacturing, the lower is the probability of child participation in the labor market, though it is more significant for girls than boys. In other words, the share of adults engaged in manufacturing has negative, though insignificant, impact on boys work. Also, the share of adults employed in the public sector in the local labor market has strong negative impact on child labor for both genders. The percentage of adults engaged in non-regular employment has a positive significant influence on the likelihood of paid child labor. Those last two variables capture the degree of informality in the local labor market and suggest that the more informality the more likely children would participate in the labor market. To sum up, local labor market conditions are important determinants of demand for child labor.

Finally, the estimation technique adopted enable us to test for the interdependencies of the two decisions at hand. The correlation coefficient ρ is negative and significant in all estimations indicating that there is a trade off between child labor and child schooling choices. This trade-off is bigger in urban areas and for males.

5. Conclusion

Understanding the main determinants of child labor is essential for formulating effective policies in tackling child labor. Using individual level data from Egypt, the joint determinants of child labor and child schooling have been studied. The main findings of the paper are the following. Market adult wages have a strong negative influence on the probability of child labor - which provides support for Basu & Van (1998). A 10% increase in the illiterate male market wage decreases the probability of child labor by 21.5% for boys and 13.1% for girls, while, a similar rise in illiterate female wage rate, lowers the probability of child participation in the labor market by 18.5% for boys and 4.3% for girls. Also, higher local income inequality in a province/ region increases the likelihood of child labor as conjectured by Swinnerton & Rogers (1999). In addition, parents who were child laborers themselves are more likely to send their children out to work. Thus, not only is poverty the

main cause of child labor, but the results indicate that child labor itself helps to perpetuate poverty as well.

The findings also indicate that local labor market conditions are important determinants of child labor. The higher the share of adults employed in the public sector jobs in the local labor market, the lower would be the likelihood of child labor. The higher the proportion of adults engaged in non-regular employment in the local labor market, the higher are the odds of child labor market participation. In addition, household characteristics play an important role in influencing both child labor and child schooling. The results also suggest that there is a trade off between child labor and child schooling.

Several policy implications emerge from this paper. Policies aimed at alleviating poverty and reducing income inequality seem to be crucial in tackling child labor and breaking the cycle of poverty transmission form one generation to the next. Improving adult employment, in particular creating more formal sector jobs would be another important policy recommendation.

References

Basu, K. (1999). 'Child labor: cause, consequence, and cure, with remarks on international standards.' *Journal of Economic Literature*, vol.37, pp. 1083-1119.

Basu, K. and Van, P. H. (1998). 'The economics of child labor: comment.' *The American Economic Review*, vol.88, pp. 412- 427.

Bhalotra, S. and Heady, C. (1998). 'Child labor in rural Pakistan and Ghana: myths and data.' mimeo.

Bonnet M. (1993). 'Child labor in Africa.' *International Labor Review*, vol. 132, pp. 371-389.

Canagarajah S. and Coulombe, H. (1997). 'Child labor and schooling in Ghana.' *The World Bank Working Paper Series*, No. 1844, Washington, D.C.: The World Bank .

Chernichovsky D. (1985). 'Socio-economic and demographic aspects of school enrolment and attendance in rural Botswana.' *Economic Development and Cultural Change,* vol. 33, pp. 319-332.

Diamond, C. and Fayed, T. (1998). 'Evidence on substitutability of adult and child labor.' *The Journal of Development Studies*, vol. 34, pp.62-70.

El Deib B.M. (1994). *Final Report: Child Labor in Egypt.* Cairo: Central Agency for Public Mobilisation Agency and Statistics.

Fallon, P. and Tzannatos, Z. (1998). 'Child labor: issues and directions for the World Bank' Social Protection, Human Development Network, Washington, D.C. : The World Bank.

Grootaert C. (1998). 'Child Labor in C⊥te d'Ivoire: Incidence and determinants.' The World Bank Social Development Department, Washington, D.C.: The World Bank .

Grootaert C. and Kanbur, R. (1995). 'Child labor: an economic perspective.' *International Labor Review,* vol. 134, pp.187- 580.

Handa S. (1996). 'The determinants of teenage schooling in Jamaica: rich vs. poor, females vs. males.' *The Journal of Development Studies,* vol. 32, pp. 554-580.

Hanushek, E.A. and Levy, V. (1993). 'Dropping out of school: further evidence on the role of school quality in developing countries' Rochester Centre for Economic Research Working Paper No 345, University of Rochester.

International Labor Organisation. (1997). International Programme on the Elimination of Child Labor Newsletter. 'Children and Work.' October.

Jensen, P. and Nielsen, H. S. (1997). 'Child labor or school attendance? Evidence from Zambia.' *Journal of Population Economics*, vol. 10, pp. 407-424.

Levy V. (1985). 'Cropping pattern, mechanisation, child labor, and fertility behaviour in a farming economy: rural Egypt.' *Economic Development and Cultural Change,* vol. 33, pp. 777-791.

Nielsen, H.S. (1998). 'Child labor and school attendance: two joint decisions.' *University of Aarhus Working Paper* 98-15, Denmark: University of Aarhus, Centre for Labor Market and Social Research.

Patrinos, H.A. and Psacharopoulos, G. (1997). 'Family size, schooling and child labor in Peru.' Journal of population Economics, vol. 10.

Psacharopoulos, G. and Arrigada, A.M. (1989). 'The determinants of early age human capital formation: evidence form Brazil.' *Economic Development and Cultural Change,* vol. 37, pp. 683-708.

Ravallion, M. and Wodon, Q. (2000). 'Does child labor displace schooling? Evidence on behavioural responses to an enrolment subsidy?' *The Economic Journal,* vol. 110, pp.c158-c175.

Ray, R. (1999). How child labor and child schooling interact with adult labor? *University of Tasmania Working Paper.*

Ray, R. (2000). 'Analysis of child labor in Peru and Pakistan: a comparative study.' *Journal of Population Economics,* vol. 13, no.1.

Rosenzweig M. R. and Evenson, R. (1977). 'Fertility, schooling, and the economic contribution of children in rural India: an econometric analysis.' *Econometrica*, vol. 45, pp. 1065-1079.

Rosenzweig M. R. (1981). 'Household and non-household activities of youths: issues of modelling, data and estimation strategies.' in Rodgers, G. and Standing, G. (eds.), *Child Work, Poverty and Underdevelopment,* pp. 215- 244. Geneva: ILO.

Siddiqi F. and Patrinos, H.A. (1995). Child Labor: Issues, Causes and Interventions, Human Resources Development and Operations Policy, Working Paper No. 56, Washington D.C.: The World Bank.

Skoufias, E. (1994). 'Market wages, family composition and on the time allocation of children in agricultural households.' The Journal of Development Studies, vol.30, pp.335-360.

Swinnerton, K.A. and Rogers, C.A. (1999). 'The economics of child labor: comment.' *Georgetown University Working Paper*, 99-05.

Table 1a: ***Descriptive Statistics***

	Total Sample	School Participants	Non-School Participants	LF Participants	LF Participants		Non -LF Participants
					Paid LFP	Unpaid LFP	
Age (%)							
6-11	66.42	70.11	48.88	42.21	32.79	46.27	72.09
12-14	33.58	29.89	51.12	57.79	67.21	53.73	27.91
Gender (%)							
Male	51.02	55.34	30.38	61.38	76.45	54.89	48.60
Female	48.98	44.66	69.62	38.62	23.55	45.11	51.40
Educational Level (%)							
None	10.69	----	60.45	30.89	35.54	28.85	6.32
Read & write	73.50	81.92	35.72	48.23	40.83	51.48	79.06
Primary	15.81	18.08	3.83	20.88	23.64	19.67	14.62
Region (%)							
Greater Cairo	20.12	22.87	7.24	6.72	15.77	2.82	23.26
Alex & Canal Cities	7.74	8.63	3.64	2.06	3.31	1.52	9.08
Lower Urban	8.60	9.73	3.35	5.33	8.51	3.96	9.37
Upper Urban	4.26	4.65	2.33	1.59	2.16	1.34	4.89
Lower Rural	32.19	31.06	37.58	51.76	37.04	58.09	27.61
Upper Rural	27.08	23.05	45.87	32.55	33.21	32.27	25.79
Father's Characteristics							
Father was Child Laborer (%)	41.08	38.92	51.47	57.50	44.63	63.04	37.23
Public Sector Employee (%)	31.94	35.93	13.16	17.20	18.07	16.83	35.39

Table 1a: *Descriptive Statistics (Continued)*

	Total Sample	School Participants	Non-School Participants	LF Participants	LF Participants		Non -LF Participants
					Paid LFP	Unpaid LFP	
Father's Education (%):							
Illiterate	42.18	36.04	70.69	56.57	58.08	55.92	38.80
Less than Primary	23.60	25.43	15.30	23.03	18.18	25.12	23.73
Primary	8.61	9.85	2.74	4.85	4.86	4.85	9.49
More than Primary	25.61	28.68	11.27	15.55	18.88	14.11	27.98
Mother's Characteristics							
Mother was Child Laborer (%)	18.63	17.31	25.66	41.60	25.12	48.81	13.42
Mother's Education (%):							
Illiterate	75.29	71.20	94.49	89.93	87.87	90.82	71.86
Less than Primary	9.11	10.39	3.07	5.39	5.27	5.44	9.99
Primary	5.32	6.34	0.54	2.22	3.22	1.79	6.05
More than Primary	10.28	12.07	1.90	2.46	3.64	1.95	12.10
Household's Characteristics							
Female Headed Household (%)	11.90	12.14	10.80	12.65	16.64	10.93	11.72
Mean number of children < 6 years old	1.25	1.19	1.56	1.38	1.21	1.45	1.22
HH with overseas return migrants (%)	17.28	17.80	13.92	15.98	16.08	15.94	17.58

Table 1a: *Descriptive Statistics (Continued)*

	Total Sample	School Participants	Non-School Participants	LF Participants	LF Participants		Non -LF Participants
					Paid LFP	Unpaid LFP	
Industry (%)							
Agriculture	--	--	--	74.13	36.84	88.81	--
Manufacturing	--	--	--	11.00	33.33	2.21	--
Construction	--	--	--	1.78	5.96	7.46	--
Trade	--	--	--	7.04	5.96	0.28	--
Services		--	--	5.05	15.44	0.97	--
Occupation (%)							
Sales Workers	--	--	--	6.34	4.91	6.91	--
Services Workers	--	--	--	1.00	2.11	0.55	--
Agricultural Workers	--	--	--	74.13	36.84	88.81	--
Production Workers				18.43	56.14	3.59	
Sample Size (N)	*10742*	*9043*	*1699*	*1988*	*605*	*1383*	*8754*
Total Sample (%)	100	82.54	17.46	18.99	5.71	13.28	81.01

Table 1b: *Joint Participation of Children in Working and Studying*

	Not Studying	Studying	Total
Not Working	*85*	*7902*	*8754*
	9.73	90.27	100
	50.15	87.38	81.49
Working	*847*	*1141*	*1988*
	42.61	57.39	100
	49.85	12.62	18.51
Total	*1699*	*9043*	*10742*
	15.8	84.18	100
	100	100	100

Note: The top italic figure in each entry is the absolute number; the second figure is the % of the row; the third figure is the % of the column.

Table 1c: *Labor Force and Schooling Participation Rate of Children 6-14 years old (%)*

	Working & Studying	Working Only	Studying Only	Neither	Total
Total Sample	10.63	7.88	73.56	7.93	100
Gender					
Boys	15.11	7.06	75.14	2.69	100
Girls	5.97	8.74	71.93	13.36	100
Region					
Urban	5.02	3.29	87.58	4.12	100
Rural	16.38	12.61	59.16	11.85	100
Age Group					
6-11 years old	7.92	3.97	80.76	7.34	100
12-14 years old	15.93	15.58	59.40	9.09	100

Table 2: *Determinants of Labor Force Participation & School Participation: Rural & Urban Areas (Marginal Effects)*

Variable	Total Sample		Boys		Girls	
	Work	School	Work	School	Work	School
Constant	-0.608 (11.69)	0.068 (16.33)	-0.841 (9.03)	0.098 (11.57)	-0.317 (6.42)	0.046 (14.62)
Market Wages						
Log Male wages	-0.143 (7.05)	0.018 (4.00)	-0.148 (4.20)	0.018 (2.21)	-0.117 (5.22)	0.014 (3.77)
Log Female wages	-0.079 (8.69)	-0.002 (0.88)	-0.127 (7.72)	0.005 (1.33)	-0.038 (4.46)	-0.004 (2.44)
Log Child wages	0.063 (5.21)	-0.003 (0.94)	0.070 (3.19)	-0.007 (1.22)	0.050 (4.41)	-0.001 (0.58)
Local Income Inequality						
Income Inequality (Gini)	0.004 (5.97)	---	0.004 (3.85)	---	0.003 (4.58)	---
Parents Being Child Laborers						
Father was Child Laborer	0.039 (6.50)	-0.0003 (0.21)	0.054 (4.91)	0.001 (0.28)	0.024 (4.28)	-0.001 (0.69)
Mother was Child Laborer	0.080 (13.09)	0.001 (0.81)	0.098 (8.37)	-0.001 (0.44)	0.056 (10.28)	0.001 (0.69)
Child Characteristics						
Male	0.061 (11.30)	0.022 (17.95)	---	---	---	---
Age	0.034 (28.49)	-0.004 (18.59)	0.052 (23.16)	-0.005 (11.61)	0.019 (16.44)	-0.003 (14.86)
Father's Characteristics						
Employed in Public Sector	-0.047 (6.76)	0.013 (8.02)	-0.057 (4.53)	0.015 (4.41)	-0.034 (4.85)	0.009 (7.15)
Education (ref.: illiterate)						
Less than Primary	-0.019 (2.91)	0.018 (11.91)	-0.026 (2.18)	0.021 (6.67)	-0.013 (3.06)	0.012 (10.04)
Primary	-0.048 (4.08)	0.024 (8.33)	-0.075 (3.60)	0.027 (4.70)	----	----
More than Primary	-0.035 (2.61)	0.040 (8.97)	-0.089 (3.55)	0.040 (4.90)	----	----
Primary & more					-0.073 (3.82)	0.040 (9.29)

Table 2: *Determinants of Labor Force Participation & School Participation: Rural & Urban Areas (Marginal Effects) - (Continued)*

Mother's Education (ref.: illiterate)						
Less than Primary	-0.037	0.013	-0.030	0.009	-0.034	0.010
	(3.52)	(5.13)	(1.67)	(1.83)	(3.06)	(4.89)
Primary	-0.051	0.023	-0.030	0.009	----	----
	(3.01)	(5.14)	(1.08)	(1.16)		
More than Primary[1]	-0.080	0.030	-0.068	0.025	----	----
	(4.32)	(4.56)	(2.31)	(2.30)		
Primary or more	----	----	----	----	-0.034	0.040
					(3.82)	(3.08)
Household Characteristics						
Female head	-0.001	0.016	-0.021	0.019	0.010	0.011
	(0.14)	(8.04)	(1.25)	(4.49)	(1.13)	(7.06)
Number of children less	0.011	-0.004	0.014	-0.003	0.007	-0.003
than 6 years old	(4.45)	(6.72)	(3.27)	(2.21)	(2.99)	(7.03)
Overseas Return Migrant	-0.012	0.012	-0.023	0.011	-0.004	0.006
(dummy=1)	(1.55)	(5.21)	(1.72)	(3.09)	(0.60)	(4.42)
Regional Characteristics						
Adults engaged in	-0.002	---	-0.0002	---	-0.003	---
Manufacturing (%)	(2.66)		(0.20)		(3.53)	
Adults employed in Public	-0.004	---	-0.003	---	-0.003	---
Sector (%)	(5.41)		(3.02)		(3.89)	
Adults engaged in non-	0.001	---	0.002	---	-0.0003	---
regular employment (%)	(1.13)		(1.41)		(0.38)	
Region (ref.: G. Cairo)						
Alex & Canal Cities	0.003	-0.007	0.003	-0.007	0.026	-0.007
	(0.16)	(2.06)	(0.83)	(0.56)	(1.38)	(2.79)
Lower Urban	0.023	-0.002	0.023	-0.002	0.005	0.003
	(1.77)	(0.52)	(2.43)	(1.51)	(0.33)	(1.02)
Upper Urban	-0.061	-0.001	-0.061	-0.001	-0.034	-0.002
	(3.72)	(0.27)	(2.99)	(0.43)	(1.76)	(0.87)
Lower Rural	0.069	-0.015	0.069	-0.015	0.053	-0.014
	(2.99)	(5.43)	(2.04)	(1.38)	(2.29)	(6.19)
Upper Rural	0.039	-0.026	0.039	-0.026	0.039	-0.024
	(1.39)	(9.75)	(0.76)	(2.15)	(1.43)	(11.19)
Δ	-0.58 (31.46)		-0.64 (24.61)		-0.51 (16.99)	
Sample size	10742		5466		5276	
Log likelihood	-6918.60		-3422.40		-3361.70	

Absolute values of t-statistics are in parentheses. Δ is coefficient of correlation between the two equations.

Table 3: *Determinants of Labor Force Participation & School Participation: Rural Areas Only (Marginal Effects)*

Variable	Total Sample		Boys		Girls	
	Work	School	Work	School	Work	School
Constant	-0.981 (13.43)	0.137 (12.04)	-1.219 (10.25)	0.153 (7.72)	-0.654 (7.99)	0.147 (10.48)
Market Wages						
Log Male wages	-0.306 (6.39)	0.046 (4.19)	-0.294 (3.90)	0.040 (2.63)	-0.325 (4.67)	0.055 (3.76)
Log Female wages	-0.168 (9.25)	-0.004 (0.90)	-0.223 (7.72)	0.009 (1.70)	-0.108 (4.93)	-0.014 (2.76)
Log Child wages	0.114 (4.03)	-0.002 (0.32)	0.093 (2.07)	-0.005 (0.49)	0.118 (3.68)	-0.002 (0.25)
Local Income Inequality						
Income Inequality (Gini)	0.008 (5.41)	---	0.009 (5.41)	---	0.006 (3.83)	----
Parents Being Child Laborers						
Father was Child Laborer	0.073 (5.65)	-0.006 (1.64)	0.096 (4.53)	-0.006 (1.13)	0.053 (3.70)	-0.005 (1.20)
Mother was Child Laborer	0.128 (10.38)	0.006 (1.82)	0.153 (7.66)	-0.0001 (0.02)	0.099 (7.10)	0.009 (2.17)
Child Characteristics						
Male	0.060 (5.31)	0.062 (20.27)	----	----	----	----
Age	0.062 (24.76)	-0.008 (14.07)	0.079 (10.25)	-0.006 (7.72)	0.044 (15.51)	-0.009 (11.40)
Father's Characteristics						
Employed in Public Sector	-0.110 (6.95)	0.036 (8.49)	-0.122 (4.80)	0.028 (4.32)	-0.089 (4.88)	0.037 (7.16)
Illiterate	0.035 (2.56)	-0.043 (11.96)	0.029 (1.29)	-0.031 (5.64)	0.037 (2.47)	-0.047 (10.81)
Mother's Characteristics						
Illiterate	0.0371 (1.87)	-0.023 (4.17)	0.035 (1.08)	-0.004 (0.56)	0.036 (1.54)	-0.047 (4.76)

Table 3: *Determinants of Labor Force Participation & School Participation: Rural Areas Only (Marginal Effects) - (Continued)*

Household Characteristics						
Female head	0.035	-0.007	-0.006	-0.008	0.064	-0.006
	(1.60)	(1.24)	(0.16)	(0.90)	(2.55)	(0.80)
Number of children less than 6 years old	0.008	-0.006	0.006	-0.002	0.009	-0.008
	(1.58)	(4.38)	(0.67)	(0.86)	(1.48)	(5.06)
Overseas Return Migrant (dummy=1)	0.029	0.022	-0.062	0.022	-0.006	0.018
	(1.77)	(5.15)	(2.37)	(3.40)	(0.31)	(3.58)
Regional Characteristics						
Adults engaged in Manufacturing (%)	-0.005	---	-0.002	---	-0.009	---
	(4.16)		(1.24)		(3.72)	
Adults employed in Public Sector (%)	-0.011	---	-0.011	---	-0.008	---
	(6.05)		(4.03)		(3.31)	
Adults engaged in non-regular employment (%)	0	---	0.001	---	-0.002	---
	(0.02)		(0.57)		(0.98)	
Region (ref.: G. Cairo)						
Lower Rural	0.054	0.025	0.054	0.008	0.046	0.034
	(2.88)	(6.91)	(1.83)	(1.47)	(2.04)	(7.86)
Δ	-0.53 (21.84)		-0.56 (14.47)		-0.51 (15.38)	
Sample size	5299		2674		2625	
Log likelihood	-4695.91		-2158.51		-2483.36	

Absolute values of t-statistics are in parentheses. Δ is coefficient of correlation between the two equations.

Table 4: *Determinants of Paid Labor Force Participation & School Participation: Rural & Urban Areas (Marginal Effects)*

Variable	Total Sample		Boys		Girls	
	Paid Work	School	Paid Work	School	Paid Work	School
Constant	-0.170 (8.43)	0.018 (16.18)	-0.308 (6.76)	0.038 (11.45)	-0.054 (3.52)	0.005 (14.40)
Market Wages						
Log Male wages	-0.044 (5.45)	0.005 (4.64)	-0.074 (4.25)	0.009 (2.85)	-0.018 (2.75)	0.002 (4.04)
Log Female wages	-0.017 (4.83)	-0.0003 (0.71)	-0.036 (4.67)	0.002 (1.70)	-0.001 (0.50)	-0.0003 (2.31)
Log Child wages	0.029 (6.48)	-0.001 (0.80)	0.042 (4.51)	-0.003 (1.14)	0.002 (3.88)	-0.0001 (0.52)
Local Income Inequality						
Income Inequality (Gini)	0.001 (4.08)	---	0.002 (3.36)	---	0.001 (2.59)	---
Parents Being Child Laborers						
Father was Child Laborer	-0.002 (0.88)	0 (0.10)	-0.004 (0.79)	0.0006 (0.61)	-0.0004 (0.25)	0 (0.46)
Mother was Child Laborer	-0.001 (0.49)	0.0004 (0.99)	-0.004 (0.73)	-0.0001 (0.10)	0.0006 (0.38)	0.0001 (1.10)
Child Characteristics						
Male	0.025 (11.40)	0.006 (17.92)	---	---	---	---
Age	0.007 (15.33)	-0.001 (18.81)	0.016 (14.87)	-0.002 (12.28)	0.002 (4.48)	-0.0003 (14.78)
Father's Characteristics						
Employed in Public Sector	-0.003 (1.11)	0.003 (8.10)	-0.003 (0.48)	0.006 (4.51)	-0.003 (1.11)	0.001 (6.76)
Education (ref.: illiterate)						
Less than Primary	-0.011 (4.27)	0.005 (12.20)	-0.019 (3.39)	0.009 (7.00)	-0.005 (2.09)	0.001 (10.24)
Primary	-0.019 (4.00)	0.006 (8.31)	-0.032 (3.29)	0.011 (4.88)	---	0.001 (6.81)
More than Primary	-0.022 (3.59)	0.010 (8.66)	-0.049 (3.78)	0.015 (4.86)	----	0.003 (5.96)
Primary or more	----	----	----	----	-0.011 (2.39)	----

Table 4: *Determinants of Paid Labor Force Participation & School Participation: Rural & Urban Areas (Marginal Effects) - (Continued)*

Mother's Education (ref.: illiterate)						
Less than Primary	-0.010	0.003	-0.017	0.004	-0.004	0.001
	(2.49)	(5.17)	(1.84)	(1.78)	(1.04)	(4.87)
Primary	-0.008	0.006	-0.007	0.003	-----	----
	(1.30)	(5.05)	(0.58)	(1.19)		
More than Primary	-0.020	0.008	-0.029	0.010	-----	----
	(2.36)	(4.75)	(1.75)	(2.35)		
Primary or more	----	----	----	----	-0.010	0.004
					(1.29)	(3.59)
Household's Characteristics						
Female head	-0.001	0.001	-0.003	0.007	0.001	0.001
	(0.40)	(7.95)	(0.38)	(4.56)	(0.38)	(6.38)
Number of children less	-0.0003	-0.001	0.003	-0.001	-0.002	-0.0003
than 6 years old	(0.26)	(6.78)	(1.42)	(2.31)	(2.28)	(7.06)
Overseas Return Migrant	-0.001	0.002	0.002	0.004	-0.003	0.001
(dummy=1)	(0.26)	(5.05)	(0.33)	(3.14)	(1.42)	(3.93)
Regional Characteristics						
Adults engaged in	0.001	---	0.002	---	----	---
Manufacturing (%)	(3.53)		(3.65)			
Adults employed in Public	-0.001	---	-0.002	---	-0.001	---
Sector (%)	(4.35)		(3.43)		(2.10)	
Adults engaged in non-	0.001	---	0.002	---	0.0004	---
regular employment (%)	(3.88)		(2.81)		(1.63)	
Region (ref.: G. Cairo)						
Alex & Canal Cities	-0.002	-0.002	-0.014	-0.001	0.009	-0.001
	(0.41)	(2.04)	(1.10)	(0.50)	(1.57)	(2.80)
Lower Urban	0.006	0	0.013	-0.002	0.006	0.0003
	(1.18)	(0.06)	(1.34)	(1.04)	(1.28)	(1.33)
Upper Urban	-0.015	0	-0.027	0.002	-0.002	-0.0002
	(2.36)	(0.02)	(2.10)	(0.81)	(0.35)	(0.72)
Lower Rural	0.001	-0.004	-0.016	-0.002	0.016	-0.001
	(0.12)	(5.10)	(0.78)	(0.87)	(1.75)	(5.94)
Upper Rural	-0.002	-0.007	-0.013	-0.003	0.012	-0.002
	(0.21)	(9.37)	(0.49)	(1.67)	(1.16)	(10.82)
Δ	-0.51(20.20)		-0.59 (18.94)		-0.34 (5.42)	
Sample size	10742		5466		5276	
Log likelihood	-5242.35		-2636.60		-2445.93	

Absolute values of t-statistics are in parentheses.

Table 5a: *Predicted Probabilities of Child Labor and Child Schooling (%)*

	Working & Studying	Working Only	Studying Only
Total Sample (Urban & Rural Areas)			
Boys	15.44	6.87	74.46
Girls	5.68	8.94	72.53
Rural Areas			
Boys	23.14	11.72	60.44
Girls	8.75	15.00	58.65
Urban Areas			
Boys	8.06	2.23	87.90
Girls	2.64	2.95	86.27

Table 5b: *The Effect of Adult Market Wages on the Predicted Probability of Child Working (%)*[1]

	Boys	Girls
Total Sample (Urban & Rural)		
Male Market Wages	2.15	1.31
Female Market Wages	1.85	0.43
Rural Areas		
Male Market Wages	2.51	2.17
Female Market Wages	1.90	0.72
Urban Areas		
Male Market Wages	1.88	1.36
Female Market Wages	1.75	0.41

[1]The absolute change in the predicted probability of child working as a result of a 1 % change in provincial market adult wage relative to the national average.

Social Protection Discussion Paper Series

No.	Title
0104	Kazakhstan: An Ambitious Pension Reform by Emily S. Andrews
0103	Long-term Consequences of an Innovative Redundancy-retraining Project: The Austrian Steel Foundation by Rudolf Winter-Ebmer
0102	Community Based Targeting Mechanisms for Social Safety Nets by Jonathan Conning and Michael Kevane
0101	Disability and Work in Poland by Tom Hoopengardner
0024	Do Market Wages Influence Child Labor and Child Schooling? by Jackline Wahba
0023	Including the Most Vulnerable: Social Funds and People with Disabilities by Pamela Dudzik and Dinah McLeod
0022	Promoting Good Local Governance through Social Funds and Decentralization by Andrew Parker and Rodrigo Serrano
0021	Creating Partnerships with Working Children and Youth by Per Miljeteig
0020	Contractual Savings or Stock Market Development. Which Leads? by Mario Catalan, Gregorio Impavido and Alberto R. Musalem
0019	Pension Reform and Public Information in Poland by Agnieszka Chlon
0018	Worker Reallocation During Estonia's Transition to Market: How Efficient and How Equitable? by Milan Vodopivec
0017	How Poor are the Old? A Survey of Evidence from 44 Countries by Edward Whitehouse
0016	Administrative Charges for Funded Pensions: An International Comparison and Assessment by Edward Whitehouse

Social Protection Discussion Paper Series continued

No.	Title
0015	The Pension System in Argentina: Six years after the Reform by Rafael Rofman and Buenos Aires
0014	Pension Systems in East Asia and the Pacific: Challenges and Opportunities by Robert Holzmann, Ian W. Mac Arthur and Yvonne Sin
0013	Survey of Disability Projects. The Experience of SHIA, Swedish International Aid for Solidarity and Humanity by Kaj Nordquist
0012	The Swedish Pension Reform Model: Framework and Issues by Edward Palmer
0011	Ratcheting Labor Standards: Regulation for continuous Improvement in the Global Workplace by Charles Sabel, Dara O'Rourke and Archon Fung
0010	Can Investments in Emerging Markets Help to Solve the Aging problem? by Robert Holzmann
0009	International Patterns of Pension Provision by Robert Palacios and Montserrat Pallarès-Miralles
0008	Regulation of Withdrawals in Individual Account Systems by Jan Walliser
0007	Disability Issues, Trends and Recommendations for the World Bank by Robert L. Metts
0006	Social Risk Management: A New Conceptual Framework for Social Protection and Beyond by Robert Holzmann and Steen Jørgensen
0005	Active Labor Market Programs: Policy Issues for East Asia by Gordon Betcherman, Amit Dar, Amy Luinstra, and Makoto Ogawa
0004	Pension Reform, Financial Literacy and Public Information: A Case Study of the United Kingdom by Edward Whitehouse

Social Protection Discussion Paper Series continued

No.	Title
0003	Managing Public Pension Reserves Part I: Evidence from the International Experience by Augusto Iglesias and Robert J. Palacios
0002	Extending Coverage in Multi-Pillar Pension Systems: Constraints and Hypotheses, Preliminary Evidence and Future Research Agenda by Robert Holzmann, Truman Packard and Jose Cuesta
0001	Contribution pour une Stratégie de Protection Sociale au Bénin by Maurizia Tovo and Regina Bendokat

* The papers below (No. 9801-9818 and 9901-9934) are no longer being printed, but are available for download from our website at www.worldbank.org/sp

9934	Helping the Poor Manage Risk Better: The Role of Social Funds by Steen Jørgensen and Julie Van Domelen
9933	Coordinating Poverty Alleviation Programs with Regional and Local Governments: The Experience of the Chilean Social Fund – FOSIS by Jorge C. Barrientos
9932	Poverty and Disability: A Survey of the Literature by Ann Elwan
9931	Uncertainty About Children's Survival and Fertility: A Test Using Indian Microdata by Vincenzo Atella and Furio Camillo Rosati
9930	Beneficiary Assessment of Social Funds by Lawrence F. Salmen
9929	Improving the Regulation and Supervision of Pension Funds: Are there Lessons from the Banking Sector? by Roberto Rocha, Richard Hinz, and Joaquin Gutierrez
9928	Notional Accounts as a Pension Reform Strategy: An Evaluation By Richard Disney
9927	Parametric Reforms to Pay-As-You-Go Pension Systems by Sheetal K. Chand and Albert Jaeger

Social Protection Discussion Paper Series continued

No.	Title
9926	An Asset-Based Approach to Social Risk Management: A Conceptual Framework by Paul Siegel and Jeffrey Alwang
9925	Migration from the Russian North During the Transition Period by Timothy Heleniak
9924	Pension Plans and Retirement Incentives by Richard Disney and Edward Whitehouse
9923	Shaping Pension Reform in Poland: Security Through Diversity by Agnieszka Chlon, Marek Góra and Michal Rutkowski
9922	Latvian Pension Reform by Louise Fox and Edward Palmer
9921	OECD Public Pension Programmes in Crisis: An Evaluation of the Reform Options by Richard Disney
9920	A Social Protection Strategy for Togo by Regina Bendokat and Amit Dar
9919	The Pension System in Singapore by Mukul G. Asher
9918	Labor Markets and Poverty in Bulgaria by Jan J. Rutkowski
9917	Taking Stock of Pension Reforms Around the World by Anita M. Schwarz and Asli Demirguc-Kunt
9916	Child Labor and Schooling in Africa: A Comparative Study by Sudharshan Canagarajah and Helena Skyt Nielsen
9915	Evaluating the Impact of Active Labor Programs: Results of Cross Country Studies in Europe and Central Asia by David H. Fretwell, Jacob Benus, and Christopher J. O'Leary
9914	Safety Nets in Transition Economies: Toward a Reform Strategy by Emily S. Andrews and Dena Ringold

Social Protection Discussion Paper Series continued

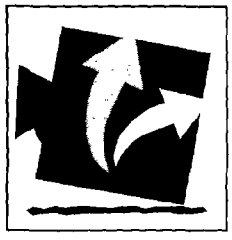
No.	Title
9913	Public Service Employment: A Review of Programs in Selected OECD Countries and Transition Economies by Sandra Wilson and David Fretwell
9912	The Role of NPOs in Policies to Combat Social Exclusion by Christoph Badelt
9911	Unemployment and Unemployment Protection in Three Groups of Countries by Wayne Vroman
9910	The Tax Treatment of Funded Pensions by Edward Whitehouse
9909	Russia's Social Protection Malaise: Key Reform Priorities as a Response to the Present Crisis edited by Michal Rutkowski
9908	Causalities Between Social Capital and Social Funds by Jesper Kammersgaard
9907	Collecting and Transferring Pension Contributions by Rafael Rofman and Gustavo Demarco
9906	Optimal Unemployment Insurance: A Guide to the Literature by Edi Karni
9905	The Effects of Legislative Change on Female Labour Supply: Marriage and Divorce, Child and Spousal Support, Property Division and Pension Splitting by Antony Dnes
9904	Social Protection as Social Risk Management: Conceptual Underpinnings for the Social Protection Sector Strategy Paper by Robert Holzmann and Steen Jorgensen
9903	A Bundle of Joy or an Expensive Luxury: A Comparative Analysis of the Economic Environment for Family Formation in Western Europe by Pierella Paci
9902	World Bank Lending for Labor Markets: 1991 to 1998 by Amit Dar and Zafiris Tzannatos

Social Protection Discussion Paper Series continued

No.	Title
9901	Active Labor Market Programs: A Review of the Evidence from Evaluations by Amit Dar and Zafiris Tzannatos
9818	Child Labor and School Enrollment in Thailand in the 1990s By Zafiris Tzannatos
9817	Supervising Mandatory Funded Pension Systems: Issues and Challenges by Gustavo Demarco and Rafael Rofman
9816	Getting an Earful: A Review of Beneficiary Assessments of Social Funds by Daniel Owen and Julie Van Domelen
~~9815~~	This paper has been revised, see Discussion Paper No. 9923
9814	Family Allowances by Suzanne Roddis and Zafiris Tzannatos
9813	Unemployment Benefits by Zafiris Tzannatos and Suzanne Roddis
9812	The Role of Choice in the Transition to a Funded Pension System by Robert Palacios and Edward Whitehouse
9811	An Alternative Technical Education System: A Case Study of Mexico by Kye Woo Lee
9810	Pension Reform in Britain by Edward Whitehouse
9809	Financing the Transition to Multipillar by Robert Holzmann
9808	Women and Labor Market Changes in the Global Economy: Growth Helps, Inequalities Hurt and Public Policy Matters by Zafiris Tzannatos
9807	The World Bank Approach to Pension Reform by Robert Holzmann

Social Protection Discussion Paper Series continued

No.	Title
9806	Government Guarantees on Pension Fund Returns by George Pennacchi
9805	The Hungarian Pension System in Transition by Robert Palacios and Roberto Rocha
9804	Risks in Pensions and Annuities: Efficient Designs by Salvador Valdes-Prieto
9803	Building an Environment for Pension Reform in Developing Countries by Olivia S. Mitchell
9802	Export Processing Zones: A Review in Need of Update by Takayoshi Kusago and Zafiris Tzannatos
9801	World Bank Lending for Labor Markets: 1991 to 1996 by Amit Dar and Zafiris Tzannatos



Summary Findings

This paper provides empirical evidence on the joint determinants of child labor and child schooling using individual level data from Egypt. The main findings are as follows: (i) A 10% increase in the illiterate male market wage decreases the probability of child labor by 21.5% for boys and 13.1% for girls. (ii) Higher local regional income inequality increases the likelihood of child labor. (iii) Parents who were child laborers themselves are more likely to send their children out to work. (vi) Local labor market conditions- the share of adults engaged in the public sector or in non-regular jobs- play an important role in influencing child labor participation. (iv) There is a trade-off between child labor and child schooling. The results suggest that not only is poverty the main cause of child labor, but that child labor perpetuates poverty as well.

HUMAN DEVELOPMENT NETWORK

About this series...

Papers in this series are not formal publications of the World Bank. They present preliminary and unpolished results of analysis that are circulated to encourage discussion and comment; citation and the use of such a paper should take account of its provisional character. The findings, interpretations, and conclusions expressed in this paper are entirely those of the author(s) and should not be attributed in any manner to the World Bank, to its affiliated organizations or to members of its Board of Executive Directors or the countries they represent. For free copies of this paper, please contact the Social Protection Advisory Service, The World Bank, 1818 H Street, N.W., Room G8-138, Washington, D.C. 20433-0001. Telephone: (202) 458-5267, Fax: (202) 614-0471, E-mail: socialprotection@worldbank.org or visit the Social Protection website at www.worldbank.org/sp.