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MOTHER'S AND CHILDREN'S EMPLOYMENT IN TURKEY

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ABSTRACT

The paper attempts to identify the link between children's employment and that of their mothers in Turkey's labor market. Statistical evidence indicates that a disproportionately larger number of employed women are in households where there is at least one working child. Considering that this may not be a random occurrence the study treats mother's employment to be endogenous to the employment decision of children. Indeed, the study establishes that mother's employment decision and that of children cannot be thought independently of each other. The unobservables that increase the likelihood of women's employment also increase the employment probability of children, in particular of female children. The findings of the paper question the current policy initiatives geared toward decreasing child labor and recommends that poverty alleviation programs be carefully designed taking into account the link between mother's and children's employment.

JEL Classifications: J13, J21, J16

Keywords: Child Labor, Mother's Employment, Gender, Middle East, Turkey

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INTRODUCTION

The study analyzes the factors that determine the employment of children with the aim of unearthing the link between children's employment and that of their mothers. Child labor has been on the agenda of the Turkish government since the early 1990s when Turkey joined the International Program on the Elimination of Child Labor (IPEC), an ILO initiative. Since then, various measures have been taken to curb child labor ranging from legislative work to the uplifting of the economic status of poor households. As a result of these efforts, the incidence of child labor is brought down to 4.2 percent by the end of the 1990s, which represented over a 50 percent decline over the decade (SIS, 2002).

While the employment of adult men in Turkey is almost universal, women's participation in the labor market, especially in urban areas, is rather low; the average rate in the past decade has been on the order of 16 percent in urban and 48 percent in rural areas.¹ Married women have even lower participation rates. The gap between married and single women exceeds 10 percentage points in urban areas. Notwithstanding these general observations, surprisingly high participation rates are recorded for women (as high as 70 percent) in households where there is at least one working child. Our reluctance to treat the disproportionate number of such women as a random occurrence has been the main motivation for this study, prompting us to investigate children's work outcomes and the employment of their mothers jointly. More explicitly, in our model mother's employment gets determined simultaneously with the employment of children.

There might be various reasons why mother's and children's employment might be linked. Female children and their mothers are documented to work side by side in Turkey, sharing each other's work in family establishments (White, 1993). Neither is it uncommon to see women taking their daughters along to work such as in the case of cleaning ladies who work for a day's wage cleaning private homes and offices. Another reason can be social pressure. Anecdotal evidence indicates that male children would rather take a job themselves than see their mothers employed. The resistance to mother's employment when it exists partly reflects the household's attitude towards women's work. Not surprisingly when male child workers are asked whether they would consider employing their children when they start their own families, many explicitly indicate that they would rather employ their children than their future wives.

There is a growing international literature on child labor. To the best of our knowledge the link between the work outcomes of children and the employment of mothers has not been empirically tested, neither has it been addressed in the very few studies that exist on child labor in Turkey (Ertürk, 1994; Tunalı, 1997; Dayioğlu, 2005, 2006). Grootaert and Kanbur (1995), in their survey article on child labor, mention the possibility of the girl child taking over mother's household work when she starts working but they do not consider the possibility that the girl child might actually be drawn to the labor market. In their pioneering work on child labor, Rosenzweig and Evenson (1977) consider mother's employment as a decision variable to be determined along with the work outcomes of children. However, they do not explicitly consider the relationship between mother's employment and the employment of children but rather analyze the responsiveness of children's employment to adult and own wages. A fair amount of work that followed Rosenzweig and Evenson has employed a similar line of investigation (See for instance, Levy, 1985; Skoufias, 1994; Binder and Scrogin, 1999).²

In identifying the link between mother's employment and that of children we make use of child labor surveys carried out in 1994 and 1999. The availability of data from two points in time not only allows a check on the robustness of our findings, but also offers a convenient way of analyzing the link between children's and mother's employment since between the two time periods important institutional changes that have the potential of affecting the employment of children have taken place. Ascertaining whether these changes have affected the employment of mothers would help shed light on the nature of the relationship between the employment of mothers and their children.

The paper is organized as follows. We first lay out the model employed in analyzing the work outcomes of children and their mothers. We, then, give a brief overview of the general characteristics of children and their households in Turkey. This is followed by the presentation of the findings on the determinants of child labor and the link between the employment outcomes of children and their mother's. We conclude the paper by summarizing the key findings and evaluating the current policy initiatives in Turkey.

METHODOLOGY EMPLOYED AND THE ESTIMATION STRATEGY

The study analyzes the time allocation of children and their mothers within the framework of the neoclassical model where the household is viewed as maximizing a common utility function subject to the full income budget constraint. The reduced form equation of work can be expressed as a function of the characteristics of the child, his/her

parents, and that of the household and the community at large.³ Among child characteristics we consider age and gender. The likelihood that the child will work increases with age. This can be explained by the higher opportunity cost of not working for older children. Due to female seclusion, the probability of work for the female child, when it takes the form of wage work, is expected to be substantially lower.

Among parental characteristics we consider the age and the education level of the mother and the father of the child. Human capital embodied in parents as measured by schooling and experience, determine their productivity at home and the market. A priori it is not possible to determine the way in which higher price of parental time will affect the time allocation of children since the income and substitution effects impact on the outcome differently. However, taking into account the added possibility that higher formal and informal education changes the preferences of the parents toward the schooling of their children, we might observe a positive impact stemming from parental education.

The neoclassical model identifies the household unearned income as an important determinant of the employment outcome of children. Unfortunately our data set does not contain this information. Instead, and assuming that paternal work decision is taken independently of children's, we use father's sector of employment as a proxy for the economic status of the household. As yet another control on the economic standing of the household, we employ a wealth index which is constructed on the basis of housing characteristics and facilities using principal components analysis. Since housing characteristics and facilities will show variations between urban and rural areas owing to the differing regional needs (Filmer and Pritchett, 1998; Assaad et al., 2001), we have constructed the index separately for urban and rural areas. Using the wealth index, we identify the urban and rural households in 'poverty' to be those who are at the bottom 20 percent in terms of their wealth score.⁴ In the child labor literature, the positive relationship between household-based establishments and child labor is stressed. In an effort to capture this effect, we identify households with agricultural and non-agricultural establishments. We also control for region specific variations in labor markets by distinguishing rural households from the urban ones.

Mother's employment also depends on a set of individual, household and community characteristics such as her age, the level of her education, demand on women's time at home and household resources. The household characteristics that might affect women's employment include the age and the education level of her husband and his sector of employment. These factors not only determine the labor market earnings of the husband, which can be taken as unearned income for her, but also affect the social status of the couple and the values they share with the community they are in. In more conservative sections of the society, women's proper role in the society is still seen as homemaking unless the family is in need of her monetary contribution. In this sense, one might expect to see higher female employment among poorer sections of the society but if higher income households have a more open attitude toward women's labor market employment, the link between household income and women's employment gets blurred. In such settings, the existence of a household establishment might resolve the problem of 'preserving family's reputation' while allowing women to work. Hence, we employ the existence of a household-based establishment as an explanatory variable in mother's work equation as well. Children may negatively affect women's participation by raising

her reservation wage. The negative impact of children on women's employment is expected to be especially high if children are young and affordable child care facilities are limited in supply, which is the case in Turkey where working women generally rely on informal arrangements for child care such as getting help from the extended family. We, therefore, attempt to control the demand on women's time at home by including household size, number of children and the age of the child in question in the mother's employment equation.

Consistent with our conjecture that the decisions on children's and mother's employment are inter-dependent, we analyze the two outcomes using a bivariate probit model. The advantage of this estimation procedure is that it allows the error terms of the two equations to be correlated with each other but does not require the ordering of the decisions. Using this bivariate set-up, we can determine whether the error terms are indeed correlated warranting simultaneous estimation of the two equations.

Another interesting question in this context is to do with the direction of causality. Is it the case that children start working first followed by their mothers, or that mothers start working and then, their children join in? It might of course very well be that the two decisions are taken simultaneously so that we see mother's employment affecting children's work outcomes and children's employment status affecting the employment of their mother. To determine the direction of causality we need to identify the work equations of mothers and children, which can be done using exclusion variables. For instance, if we could come up with at least one instrument that determines women's (children's) but not children's (mother's) employment, then we could test whether the employment of mothers (children) affects children's (mother's) work decision. Unfortunately, our data sets being products of modular surveys lack suitable instruments. External data on demand side factors, for instance local adult and child wages, that could possibly work as instruments are also rather scanty. Instead, we rely on a different estimation strategy. We make use of the fact that between the two survey years important institutional changes have taken place. The first change took the form of the extension of compulsory schooling in 1997 from five to eight years, covering all children 15 years of age and younger. The second change was the banning of child labor less than 15 years of age in 1998. Prior to this date, children as young as 12 years of age could work in industry. An age limit did not exist for children working in family establishments or in agriculture. These institutional changes are expected to negatively affect the likelihood of children's employment, reducing the incidence of child labor in 1999 as compared to 1994. The interesting point, however, is the likely effect of these changes on the employment of women. If it is the case that the decision on children's employment is taken first, followed by the decision on women's employment, then it would follow that a reduction in child labor will be accompanied by a reduction in women's employment. An insignificant or positive time effect, on the other hand, would mean either that women's employment occurs first followed by their children's or that the two decisions are taken simultaneously. The present model does not distinguish between these two orderings.

The employed model can be summarized as follows:

$$W_i^* = X_i \beta_i + T \delta_i + \mu_i,$$

$$W_i = \begin{cases} 1 & \text{if } X_i \beta_i + T \delta_i + \mu_i \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$L_j^* = Z_j \alpha_j + T \eta_j + \psi_j,$$

$$L_j = \begin{cases} 1 & \text{if } Z_j \alpha_j + T \eta_j + \psi_j \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

where W_i^* and L_j^* are latent variables indicating the propensity of the child to engage in work and the propensity of the mother to work, respectively. The child/mother is observed to engage in market work only if a certain (unobserved) threshold is surpassed. X and Z denote the vector of relevant child, maternal, household and community characteristics. T is a dummy variable taking the value of 1 for 1994 and 0 for 1999. The parameter vectors are denoted by β , α , δ and η , while μ and ψ are normally and independently distributed error terms, which are allowed to be correlated with each other.

DATA AND CHARACTERISTICS OF WORKING CHILDREN

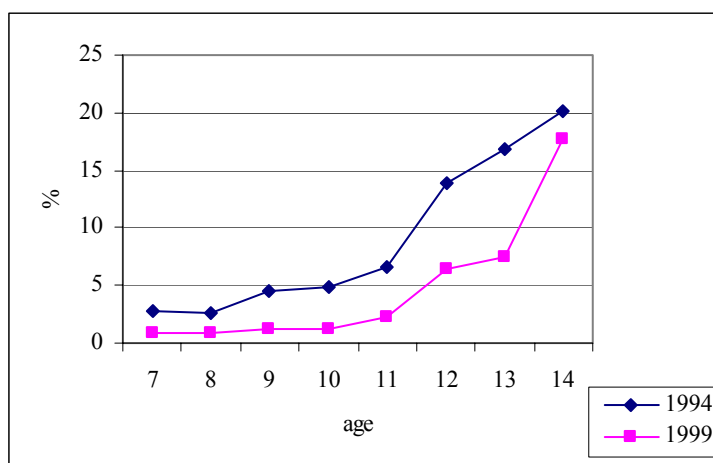
The data for this study come from the 1994 and 1999 Child Labor Surveys (CLS), which were administered as modules of the biannual Household Labor Force Surveys of the State Institute of Statistics (SIS) of Turkey. The 1994 CLS includes 9,822 children between the ages of 7-14 from 5,686 households. The 1999 CLS, on the other hand, covers 11,801 children from 7,241 households. From the former, 8,933 and from the latter 10,990 children who could be linked to their mother's and father's in the household and who were single at the time of the survey are drawn.⁵ The child is considered to be employed if he/she has done at least one hour of market work in the reference week. The work status of the child is determined directly from the answers given by the child to a series of labor market questions probing him/her about possible forms of market work he/she might have carried out during the reference week such as wage work, work without pay within the family establishment, apprenticeship, petty trade and the like.

The data reveal that 8.8 percent of children were engaged in market work in 1994. This figure dropped dramatically to 4.5 percent in 1999.⁶ Although in the empirical analysis we pool observations from 1994 and 1999, in Table 1 we provide descriptive statistics relating to the two survey years separately to illustrate the nature of child labor in both years. Before proceeding on to discuss Table 1, it might be useful to briefly mention the general macro-economic background in 1994 and 1999. Both years signify a major downturn in economic activity in Turkey with more than 6 percent reduction in national income. While the size of the economic downturns in both years was similar, they were initiated by different factors. While the main source of the 1994 downturn was macroeconomic instability, in 1999, it was a devastating earthquake that hit the Marmara region, the industrial heartland of Turkey. Table 1 show that the change in the population characteristics over the studied period, including the change in the proportion of the population living in poverty, is not that large so that the drastic drop in child labor is probably not the end result of the changing macro-economic environment or socio-demographic factors. Indeed, Dayioğlu (2005) shows that the drop in child labor and the increase in schooling between 1994 and 1999 can mainly be attributed to institutional factors (i.e. the ban on child labor and the increased compulsory schooling) and not to the changing population characteristics. While the ban on child labor has been harder to enforce due mainly to the reason that the majority of working children are employed either in the informal sector or within family establishments, it has been somewhat easier

to promote the latter, owing partly to its easier monitoring. More importantly, the launching of a wide variety of schooling programs that coincided with the extension of compulsory schooling, such as reduction in schooling costs in the form of free distribution of school books, education drives conducted by NGOs, international organizations and the government, conditional cash transfer programs geared toward the poor sections of the society have all possibly played a role in generating higher school enrollment figures.

The drop in child labor over the studied period is observed for all age groups (see Figure 1) though in terms of absolute changes the biggest drop is observed among the 12 and 13-year-olds who could no longer legally work in 1999. This had the effect of increasing the average age of the child workers in 1999. The relatively small improvement in the employment status of the 14-year-olds could, on the other hand, be explained by the timing of the new education act and the ban on child labor. Since advanced age-for-grade would be a deterrent for older children's re-integration back to the schooling system, the institutional changes that occurred in 1997 and 1998 are expected to particularly affect those children who were already in school at the time the institutional changes went into effect.

FIGURE 1. CHANGES IN CHILD LABOR OVER TIME



Working children are more likely to have mothers who work as well. The differences are quite large and significant. While for the mothers of non-working children, the employment rate in 1994 was in the order of 21.9 percent, it was recorded at 69.8 percent for the mothers of working children (see Table 1). A similar gap was observed in 1999 as well. It is also interesting to note that the employment gap between the mothers of working and non-working children is larger for girls than boys. To put it

TABLE 1. DESCRIPTIVE STATISTICS FOR WORKING AND NON-WORKING CHILDREN

	1994				1999			
	Non-working Children		Working Children		Non-working Children		Working Children	
	Male	Female	Male	Female	Male	Female	Male	Female
Age	10.30 (2.18)	10.32 (2.23)	12.04 (1.83)	11.82 (2.02)	10.27 (2.24)	10.34 (2.21)	12.79 (1.60)	12.33 (1.93)
Children enrolled in school (%)	97.03	89.41	42.22	37.09	98.50	91.69	35.55	31.86
Children in wage work (%)			25.17	13.32			44.45	24.99
Father's age	39.64 (7.27)	40.02 (7.51)	43.13 (8.55)	43.73 (8.50)	39.87 (6.71)	40.15 (6.96)	44.36 (7.56)	43.83 (7.79)
Father's education in years of schooling	6.06 (3.49)	6.14 (3.49)	3.39 (2.32)	4.01 (2.03)	6.46 (3.43)	6.30 (3.38)	4.07 (2.20)	3.99 (2.43)
Father employed (%)	89.08	88.80	91.29	93.53	90.23	89.02	86.78	93.43
Father in public sector (%)	23.72	23.14	6.84	7.70	19.62	18.16	2.99	3.74
Father private sector wage worker (%)	26.04	25.29	14.79	9.68	29.25	28.42	21.13	11.83
No/absent father	3.56	3.93	2.62	3.86	3.75	3.72	3.44	4.15
Mother's age	35.55 (6.49)	35.77 (6.53)	38.35 (6.90)	39.31 (6.78)	35.85 (6.22)	35.90 (6.31)	39.83 (7.05)	39.15 (6.83)
Mother's education in years of schooling	4.04 (3.39)	3.99 (3.39)	2.09 (2.37)	2.33 (2.45)	4.51 (3.43)	4.49 (3.46)	2.00 (2.47)	2.23 (2.46)
Mother employed (%)	22.79	20.98	59.10	86.54	24.89	26.28	52.81	75.65
Mother in non-wage work as % of employed mothers	67.2	69.38	94.51	94.01	72.83	73.55	92.18	93.59
Household size	5.68 (2.04)	5.86 (1.99)	6.69 (2.16)	6.69 (2.02)	5.29 (1.78)	5.45 (1.77)	6.80 (2.56)	6.74 (2.42)
Number of children ages 0-14 years	2.72 (1.45)	2.87 (1.44)	3.22 (1.66)	3.13 (1.52)	2.55 (1.30)	2.72 (1.36)	3.22 (1.82)	3.19 (1.77)
Households with agricultural establishment (%)	17.98	17.60	57.63	69.50	19.67	19.92	47.71	62.62
Households with non-agricultural establishment (%)	14.38	14.85	10.53	5.17	20.76	21.85	12.56	12.54
Poor rural household	9.09	7.53	18.50	21.64	8.74	8.28	16.26	20.30
Poor urban household	11.87	13.86	9.31	2.72	14.59	14.62	17.45	6.87
Rural	42.20	40.02	74.49	87.30	37.59	37.05	66.83	84.59
Number of observations	4,145	4,113	422	253	5,354	5,168	281	187

Note: Figures in parentheses are standard deviations.

differently, while the probability of employment does not differ significantly between the mothers of nonworking girls and boys, the odds of finding employed mothers is higher should their daughters than sons work. This finding probably reflects the fact that mothers and daughters are more likely to share work with each other.

A potential factor that makes it easier for women and children to work together is existence of a household establishment. The data employed do not provide a direct measure of household establishment. Instead, its presence is proxied by (at least one)

self-employed adult men (18 years plus) in the household. When working and non-working children are compared, home establishments are indeed observed to be more prevalent among the former. Consistent with this observation, 63.6 percent of working children and 92.9 percent of their mothers in 1999 were found to be engaged in non-wage work. This ratio was 75.2 percent among all mothers.

TABLE 2. DISTRIBUTION OF CHILDREN AND MOTHERS (IN PERCENTAGES) BY ECONOMIC ACTIVITY

	Working Children		Mothers of employed children	
	Male	Female	all children	children
Agriculture	61.9	84.7	71.2	94.9
Manufacturing	13.2	10.7	9.5	2.7
Construction	2.3			
Trade	8.9	1.6	3.6	1.0
Finance			1.5	
Social and community services	13.3	2.9	13.5	1.3
Number of observations	703	440	4,237	700

Table 2 shows the market activities of children and their mothers in terms of broad classifications. Important similarities between male and female children and their mothers emerge, which give support to the conjecture that children and mothers can potentially share work with each other. For instance, a significant proportion of all three groups are found in agriculture. Besides agriculture, the other most common activity for female children is manufacturing. Similar to female children, roughly 10 percent of mothers are found in manufacturing. However, this proportion is lower among mothers of working children, the overwhelming majority of whom are in agriculture. In comparison to female children, the scope of male children's activities is somewhat broader. While a good proportion of male children are also employed in the manufacturing industry, they are also found in services.

In the light of the descriptive statistics, the question that comes to mind is whether in the home of working children, everyone, including the mother, is employed. To answer this question, we have computed two sets of dependency ratios. One set is computed for adults only, where the number of non-working adults is compared to the number of adults in the household. The other set of dependency ratios include children and the youth (15-17 year-olds) as well. While among all households with children, half the adults (18-64 years) in 1999 and 1994 were not employed, this figure was 20 percent in 1994 and 25 percent in 1999 for households with at least one working child. The dependency ratios that include the youth and children are naturally higher. While among all households this ratio was 68 percent in 1999, for those with at least one working child it went down to 28 percent. It seems that although a larger number of household members are employed where working children are found, by no means do we see all adult members in market work.

DETERMINANTS OF CHILD AND MOTHER'S EMPLOYMENT

The Link between Mother's and Children's Employment

Table 3 provides the results of the bivariate probit analysis on the pooled sample for male and female children. The results confirm our conjecture that mother's and children's employment decisions are not taken independently of each other. We observe that ρ , the correlation coefficient between the two error terms, is positive and significant for both the male and female children. In other words, unobservables that increase the probability of mother's employment also increases children's likelihood of work. The association between mother's employment equation and that of the girl child is particularly high, as revealed by the relatively higher correlation coefficient. The positive correlation between the equations could arise if, for instance, the woman in question has greater unmeasured marketable skills and she teaches them to her children, in particular, to female children, increasing their propensity of work. Another possible explanation is networking. If the household has greater connections to the market place (for instance through a more resourceful husband/male relative or a middleman) so that finding employment and/or marketing the output is easier, this would increase the propensity of both children's and women's employment positively. To the extent that we do not account for such networking effects properly through measured variables, its effect would be captured by the error terms, bringing about a positive association between the two equations. In the introduction, we have suggested that social norms might also play a role in determining women's and children's employment. In particular, we have suggested that if social norms negatively affect women's participation, but positively affect male children's propensity to work, a negative association between the two error terms would result. However, the empirical analysis has shown that the correlation coefficient is positive. This finding does not necessarily mean that social norms are unimportant but that there must be other unobservables, such as the ones mentioned above, that generate a positive association between the work equations of male children and that of their mothers.

Although we have illustrated the positive association between mothers' and children's work outcomes on the pooled sample, it is important to note that our findings hold for individual samples as well. ρ is positive and significant for both the male and female children, attaining a higher value among the latter in both years (see Table 4 and Appendix Tables A2 and A3). It is also interesting to note that over time a drop in the correlation coefficient has occurred with a particularly sharp decline being observed among the female children. The decline is possibly to do with the withdrawal of children from the labor market particularly from jobs that are closely associated with the work of their mothers so that some of the unobservables that make it more likely for mothers to work does not necessarily have the same effect on girls. There is evidence in the data supporting this conjecture; in comparison to 1994, in 1999 a bigger proportion of children were employed as wage earners, which probably had the effect of reducing the likelihood of work sharing among children and their mothers. We later undertake sensitivity analysis to see the impact of non-wage work possibilities proxied by the existence of household establishments on our results.

The analysis on the pooled sample clearly illustrates that the likelihood of child employment was higher in 1994 than in 1999. While a male child with average

characteristics had an employment probability of 4.4 percent in 1994, this figure dropped to 1.1 percent in 1999. For female children, the above figures were estimated at 2.7 percent in 1994 and 0.8 percent in 1999. As noted earlier, the sharp decline in child labor over the five-year period can be attributed to the ban on child labor and the extension of compulsory schooling. What is interesting to note here is that the time variable does not have a similar impact on the employment probability of the mothers. To the contrary, it either does not have an impact, meaning that the cost/benefit structure of work has not changed for them, as in the case of the mothers of male children, or it increases their employment as in the case of the mothers of female children. In the light of these findings, it seems clear that it is not the children who are put to work first.

TABLE 3. BIVARIATE PROBIT COEFFICIENT ESTIMATES FOR CHILDREN'S PROBABILITY OF WORK AND THE EMPLOYMENT OF THEIR MOTHERS

	Male children	Mothers of male children	Female children	Mothers of female children
Child's age	0.200*** [0.026]	0.016* [0.009]	0.171*** [0.028]	0.024** [0.009]
Child 12-14 year-old	0.566*** [0.121]		0.318** [0.143]	
Child 12-14*Year 1994	-0.286** [0.116]		-0.218 [0.136]	
Mother's years of education (<i>ref. Illiterate</i>)	-0.067*** [0.014]		-0.042** [0.016]	
Read and write		-0.033 [0.093]		0.004 [0.102]
Primary school		-0.014 [0.066]		0.094 [0.070]
Secondary school		0.131 [0.118]		0.244** [0.114]
High school		0.554*** [0.107]		0.674*** [0.105]
University and above		2.137*** [0.142]		2.150*** [0.152]
Mother's age	-0.006 [0.046]	0.145*** [0.039]	0.072 [0.048]	0.156*** [0.040]
Mother's age squared ($\times 10^{-2}$)	-0.005 [0.058]	-0.197*** [0.051]	-0.095 [0.059]	-0.210*** [0.050]
Father's/husbands education	-0.053*** [0.013]	0.002 [0.009]	-0.064*** [0.016]	0.001 [0.009]
Father's/husband's age	0.022 [0.038]	0.000 [0.037]	-0.002 [0.040]	-0.045 [0.036]
Father's/husband's age squared ($\times 10^{-2}$)	-0.01 [0.041]	-0.01 [0.042]	0.002 [0.042]	0.05 [0.038]
Father in public sector	-0.356*** [0.114]	-0.027 [0.078]	-0.143 [0.127]	0.006 [0.083]

Father private sector wage-earner	-0.012 [0.088]	0.052 [0.076]	0.01 [0.113]	0.051 [0.081]
No father/husband	0.446 [0.879]	0.366 [0.810]	-0.076 [0.978]	-0.488 [0.821]
No of children ages 0-14 years	0.098*** [0.030]	-0.105*** [0.029]	-0.006 [0.035]	-0.071** [0.032]
Household size	-0.014 [0.021]	0.008 [0.021]	0.03 [0.024]	-0.028 [0.022]
Household agricultural establishment	0.561*** [0.095]	1.189*** [0.090]	0.680*** [0.105]	1.237*** [0.096]
Household non-agricultural establishment	-0.031 [0.098]	0.048 [0.083]	-0.044 [0.124]	0.123 [0.092]
Poor rural household	-0.137 [0.099]	-0.109 [0.096]	0.028 [0.101]	-0.264** [0.103]
Poor urban household	0.291*** [0.080]	0.108 [0.069]	-0.027 [0.113]	0.087 [0.067]
Rural	0.386*** [0.080]	0.842*** [0.059]	0.584*** [0.090]	0.914*** [0.066]
Year 1994	0.609*** [0.100]	-0.026 [0.048]	0.455*** [0.114]	-0.090* [0.051]
Constant	-4.825*** [0.847]	-3.846*** [0.675]	-5.489*** [1.009]	-3.271*** [0.672]
Rho		0.388		0.641
Wald test for rho=0 (p-value)		0.000		0.000
Number of observations		10,202		9,721

Notes: Robust standard errors are in brackets. * significant at 10%; ** at 5%; *** at 1%.

Having established that the institutional changes did not figure in the decision process of the mothers of male children but were quite important in determining male children's employment, they can be used as exclusion variables in identifying male children's work equation. When we use the time variable as our instrument, we find that children's employment has no effect on the employment of their mothers (results not shown here).

Other Determinants of Child Employment

When we come to the other determinants of child employment, we find that our results are in line with the findings in the literature.⁸ For instance, we find that work becomes more likely for children, especially for the male child, as they grow older (see Table 3 and Appendix Table A1). The descriptive statistics provided earlier indicated that institutional changes have particularly affected the older children. This is also evident from our results where the dummy variable that identifies older children (12-14 year-olds) in year 1994 is positive for both the male and female children, but only significant for the former.⁹ Parental education, on the other hand, reduces child labor. Maternal and paternal education is found to be equally important in reducing male and female child's

TABLE 4. CORRELATION COEFFICIENT ESTIMATES FOR 1994 AND 1999

	Rho	Wald test for rho=0 (p-value)
Year 1994		
Male Children	0.425	0.000
Female Children	0.759	0.000
Year 1999		
Male Children	0.347	0.000
Female Children	0.473	0.000

probability of employment. While paternal education does not seem to favor either one of the groups, affecting the work outcomes of boys and girls equally, the impact of maternal education on girls' work outcome is greater. This is consistent with the findings in the literature (see for instance Thomas, 1994; Strauss and Thomas, 1995).

The ages of the parents do not seem to affect the likelihood of children's employment. However, father's public sector employment is an important factor reducing male child's employment. A similar effect is not observed for girls or for those children whose fathers are employed in the private sector as wage earners. Since we are controlling for the poverty status of the household, father's sector of employment, in particular whether he holds a public sector job might be proxying for networking effects, indicating work availability (or the lack of it) that could be shared with (male) children. Other household characteristics that affect children's employment include household size and the existence of household-based establishments. Children coming from larger households are more likely to work. The presence of an agricultural household-based establishment also increases the likelihood of the employment of both mothers and children significantly. The presence of a non-agricultural establishment, on the other hand, does not impact on their likelihood of employment.

Female children from poor households are observed to be under no higher risk of employment compared to their counterparts from non-poor households. The same conclusion is drawn for rural male children as well. However, male children in urban areas are found to face a substantially higher risk of employment should they happen to come from poor families.¹⁰ A similar finding is noted by Dayioğlu (2006) for older children. Evaluated at mean characteristics, male children from poor urban households are twice as likely to engage in market work as compared to their counterparts from non-poor urban households. We attribute the stronger link between urban male child's employment and the economic status of the household to the relatively more monetized nature of the urban economy. Work around the homestead is more common in rural areas making it easy for children to be part of the household production process irrespective of the economic standing of the household (Ertürk, 1994). The practice of female seclusion, in the sense that it is not regarded proper for the girl child to leave the domicile to work unaccompanied, reduces her risk of market involvement, particularly in urban areas.

Determinants of Mother's Employment

To complete the picture, we briefly discuss the employment results of children's mothers as well. The most important determinant of women's employment is their level of schooling. As she earns higher educational degrees, her likelihood of employment rises sharply with the peak occurring at the university level. Women's likelihood of employment also increases with her age though at a decreasing rate. Husband's education, age or his sector of employment are not found to be important determinants of her employment. As conjectured, the number of children negatively affects women's participation though holding the number of children constant, women's likelihood of employment increases with the child's age. Household size, the presence of a household-based agricultural establishment and rural residence all increase women's employment probability, the marginal effects of the latter two being especially dramatic. Evaluated at mean characteristics, while the probability of employment is 13 percent among women coming from households without an agricultural establishment, it increases three folds to 39 percent among those with agricultural establishments. Likewise, while the average employment rate of women in urban areas is 15 percent, predicted employment rate increases to 56 percent for rural women. Interestingly, while urban poverty does not impact on women's employment, rural poverty reduces it. The wealth index we have constructed on the basis of housing characteristics and facilities is probably an indicator of asset poverty as well, showing that the poor rural households are also the ones with no or minimal land holdings, which in turn reduces the work opportunities around the homestead.

Sensitivity Analysis

In this sub-section, we would like to see if our results are robust to model specification. For instance, as discussed earlier, the presence of a household-based establishment may naturally lead to the employment of mothers and children and therefore, constitute the essential link in their work relationship. Grootaert (1999) for instance finds that female children face higher odds of employment when their mothers work in Cote d'Ivoire and argues that although women and their daughters are often considered as substitutes, this might not be the case when work is done within a household establishment (p. 46).¹¹ If household establishments are indeed the essential link, their inclusion in the model should reduce the correlation coefficient significantly. Likewise, it may be claimed that the poverty status of the household constitutes the main link between mother's employment and that of their sons. Again, if this is so, controlling the poverty status of the household should reduce the correlation coefficient.

To see the effect of these controls on the magnitude of the correlation coefficient, we start with a model with no covariates. Such a specification results in a correlation coefficient of 0.423 for male and 0.667 for female children (Table 5). When we include all variables of interest except for the dummy variables indicating the existence of household-based establishments and the poverty status of the household, the correlation coefficients slightly increase (to 0.434 for male and to 0.669 for female children) and remain highly significant for both groups (see Table 5). Adding household establishment to the model reduces rho and by more than the inclusion of all other covariates, indicating that it

TABLE 5. CORRELATION COEFFICIENT ESTIMATES

	Rho	Wald test for rho=0 (p-value)
Constant only model		
Male Children	0.423	0.000
Female Children	0.667	0.000
No household establishment+ no poverty		
Male Children	0.434	0.000
Female Children	0.669	0.000
No poverty		
Male Children	0.390	0.000
Female Children	0.636	0.000
Full model		
Male Children	0.388	0.000
Female Children	0.641	0.000

constitutes an important link in the employment relation between mothers and their children. Notwithstanding this drop, rho remains positive and significant. Controlling for the poverty status of the household, on the other hand, brings about a slight decline in the correlation coefficient among boys but not girls.

CONCLUSION

We have shown in this paper that the employment of mothers and that of their children cannot be thought of as independent or random events. In fact, our results, which are robust to model specification, have shown that unobservables that increase the likelihood of women's employment also increases children's probability of work. We suggested that this could arise if the mother has above average marketable skills and she teaches them to her children or that the husband is especially resourceful in finding work for her and the children. We have also noted that the institutional changes that took place in 1997 and 1998 affected the employment of children and their mothers differently and found evidence that it is not the children who are put to work first.

The descriptive statistics provided in the paper show that the work spheres of children and mothers overlap. This is possibly one of the reasons why the unobservables affect children's and mother's employment in the same way. For instance, if the husband was especially resourceful in finding work for his wife that involved caring for the elderly, this would not affect the employment probability of the girl child since it would not increase her employment opportunities. If the work involved cleaning homes where the girl child could also participate or selling home-made articles where both male and female children could participate, their employment probability would increase. Currently, a significant proportion of women join the labor market as unpaid family workers. However, available evidence point that women are turning to the paid labor market (İŞKUR, 2002). Available evidence also indicates that women are becoming increasingly better educated, which as our model shows, is likely to positively impact on

the work outcomes of children. Higher educational attainment will also increase women's likelihood of holding better paying, higher status formal sector jobs, which might itself be instrumental in eliminating the need for and also the possibility of sharing work with children.

In the combat against child labor, education and training of mothers thus emerge as important policy tools. Although they can be viewed as long-term policy tools that are of little help for today, they can in fact be made operational in the short-run by way of non-formal training programs. Local administrations, NGOs and the private institutions can offer women non-formal training in 'non-traditional' areas such as book-keeping, data processing and the like. These areas are no doubt traditional occupations held by women. They are 'non-traditional' in the sense that the non-formal programs offered so far in Turkey have basically concentrated on sewing, knitting, carpet weaving which extend to children, in particular to the girl child. Non-traditional training programs do not have this inherent characteristic. However, admittedly, such an intervention might have no impact on the work outcomes of female children or might even increase their involvement in household work as they take over their mother's responsibilities at home. One would hope that women would tend to use their earnings from work to buy consumer durables and services that economize on their and female children's time at home.

Our results also have important implications for the child labor programs undertaken in Turkey. In recent programs, the emphasis has been placed on alleviating the income status of household through income generating and micro-credit programs. Our analysis has shown that such programs are likely to impact favorably on urban male children, but will not reduce the incidence of child labor among other groups. The results of our analyses have also shown that these programs might actually increase children's employment if they are home-based and built around women since women's home bound work often extends to children. The findings of the paper indicate the need for a careful study of the household dynamics in coming up with programs that reduce child labor.

ENDNOTES

* I wish to thank Ragui Assaad and Deborah Levison for their valuable comments on the earlier version of this paper. I am responsible for the remaining errors.

¹ See SIS web-site: <http://www.die.gov.tr>.

² There are also studies in the literature that treat mother's employment decision independent from the decisions taken on child's employment (see for instance the collected work in Grootaert and Patrinos (1999), Binder and Scrogin (1999)). If our conjecture is indeed correct, treating the employment status of mothers as exogenous would be unjustified, at least in the context of Turkey.

³ We consider the child as the unit of analysis. Since more than one child may come from the same household, we use the Huber correction by taking households as clusters.

⁴ In the data set, there is information on household income and expenditures. However, they were collected via a single question, which raises concerns about their reliability. Since we lack instruments to predict household income/expenditures we refrain from using them and instead rely on the wealth index to determine household material well-being. The variance accounted for by the first principal component, which is used as a basis for the construction of the index, was 20 percent and 22 percent in 1994 for urban and rural areas respectively. In 1999, these figures were recorded at 27 percent and 31 percent. The comparison of our poverty measure with that of income poverty

reveals that roughly 65-73 percent of the poor households in both years are in first two income/consumption quintiles. Less than 5 percent are found in the top quintile. In other words, the proportion of households who live under conditions that are of strike contrast with their level of current income is rather low.

⁵ A small number of children (122 cases) who could neither work nor go to school because of an illness and another group (12 cases) with mothers above 64 years of age were dropped from the data set.

⁶ Sampling weights are used throughout the paper to expand sample figures to population figures.

⁷ The Appendix Tables A2 and A3 are provided for the convenience of the referees and will be omitted from the final version of the paper to keep the presentation simple.

⁸ For similar reduced form models see for instance, Patrinos and Psacharopoulos (1997), Canagarajah and Coulombe (1997), Borooah (2000) and Ray (2000).

⁹ Re-defining the dummy variable so as to only include the 12 and 13-year-olds do not change the results.

¹⁰ The result remains unchanged when the urban dummy is interacted with other covariates.

¹¹ Unlike our study, Grootaert (1999) considers mother's employment as an exogenous variable in the work equation of the girls.

APPENDIX

TABLE A1. MARGINAL EFFECTS ON THE PROBABILITY OF WORK

	Male children	Mothers of male children	Female children	Mother s of female children
Child's age	0.010	0.005	0.006	0.007
Child 12-14 years old	0.035		0.013	
Child 12-14 * Year 1994	-0.012		-0.007	
Mother's years of education	-0.003		-0.002	
Mother – read and write		-0.009		0.001
Mother – primary school		-0.004		0.028
Mother – secondary school		0.040		0.078
Mother – high school		0.190		0.236
Mother – university		0.701		0.701
Mother's age	0.000	0.043	0.003	0.046
Mother's age squared ($\times 10^{-2}$)	0.000	-0.058	-0.004	-0.062
Father's schooling	-0.003	0.001	-0.002	0.000
Father's age	0.001	0.000	0.000	-0.013
Father's age squared ($\times 10^{-2}$)	-0.001	-0.003	0.000	0.015
Father in public sector	-0.015	-0.008	-0.005	0.002
Father in private sector	-0.001	0.016	0.000	0.015
No/absent father	0.035	0.121	-0.003	-0.118
Number of children ages 0-14 years	0.005	-0.031	0.000	-0.021
Household size	-0.001	0.002	0.001	-0.008
Household agricultural establishment	0.041	0.410	0.040	0.429
Household non-agricultural establishment	-0.002	0.014	-0.002	0.038
Poor rural household	-0.006	-0.031	0.001	-0.071
Poor urban household	0.019	0.033	-0.001	0.026
Rural household	0.021	0.256	0.026	0.282
Year 1994	0.033	-0.008	0.018	-0.027
Predicted probability at mean	0.021	0.217	0.015	0.220

Notes: Based on coefficient estimates reported in Table 3. For dummy variables, marginal effects are calculated by comparing the probability when the dummy variable is 1 and when it is 0. For continuous variables, marginal effects are calculated at the means.

TABLE A2. BIVARIATE PROBIT COEFFICIENT ESTIMATES FOR CHILDREN'S PROBABILITY OF WORK AND THE EMPLOYMENT OF THEIR MOTHERS - 1994

	Male children	Mothers of male children	Female children	Mothers of female children
Child's age	0.158*** [0.028]	0.030*** [0.011]	0.135*** [0.032]	0.014 [0.012]
Child 12-14 year-old	0.462*** [0.114]		0.253* [0.130]	
Mother's years of education (<i>ref. Illiterate</i>)	-0.056*** [0.016]		-0.024 [0.019]	
Read and write		0.146 [0.110]		0.103 [0.123]
Primary school		0.104 [0.084]		0.171* [0.089]
Secondary school		0.498*** [0.179]		0.322* [0.185]
High school		0.815*** [0.152]		0.996*** [0.152]
University and above		2.670*** [0.207]		2.457*** [0.212]
Mother's age	0.062 [0.059]	0.152*** [0.050]	0.108* [0.062]	0.182*** [0.050]
Mother's age squared ($\times 10^{-2}$)	-0.088 [0.074]	-0.199*** [0.065]	-0.124* [0.074]	-0.231*** [0.063]
Father's/husbands education	-0.054*** [0.016]	-0.015 [0.013]	-0.069*** [0.018]	-0.017 [0.012]
Father's/husband's age	-0.048 [0.048]	-0.048 [0.043]	-0.029 [0.050]	-0.081* [0.042]
Father's/husband's age squared ($\times 10^{-2}$)	0.063 [0.053]	0.046 [0.048]	0.026 [0.053]	0.081* [0.047]
Father in public sector	-0.245* [0.141]	-0.023 [0.105]	-0.08 [0.152]	0.07 [0.107]
Father private sector wage-earner	0.002 [0.108]	0.134 [0.103]	-0.016 [0.134]	0.115 [0.106]
No father/husband	-1.193 [1.102]	-0.665 [0.943]	-0.927 [1.235]	-1.615* [0.958]
No of children ages 0- 14 years	0.101*** [0.036]	-0.090*** [0.035]	0.039 [0.041]	-0.109*** [0.034]
Household size	-0.048* [0.025]	-0.021 [0.026]	-0.02 [0.029]	-0.016 [0.027]
Household agricultural establishment	0.772*** [0.113]	1.136*** [0.114]	0.844*** [0.128]	1.142*** [0.112]
Household non-	0.046	0.176	-0.15	0.098

agricultural establishment	[0.121]	[0.113]	[0.160]	[0.117]
Poor rural household	-0.116 [0.121]	-0.12 [0.108]	0.025 [0.129]	-0.336*** [0.113]
Poor urban household	0.288*** [0.111]	0.196* [0.106]	-0.178 [0.172]	0.17 [0.105]
Rural	0.349*** [0.093]	0.900*** [0.076]	0.490*** [0.109]	1.013*** [0.082]
Constant	-3.497*** [1.019]	-3.215*** [0.818]	-4.756*** [1.193]	-2.951*** [0.796]
Rho		0.425		0.759
Wald test for rho=0 (p-value)		0.000		0.000
Number of observations		4,567		4,366

Notes: Robust standard errors are in brackets. * significant at 10%; ** at 5%; *** at 1%.

TABLE A3. BIVARIATE PROBIT COEFFICIENT ESTIMATES FOR CHILDREN'S PROBABILITY OF WORK AND THE EMPLOYMENT OF THEIR MOTHERS - 1999

	Male children	Mothers of male children	Female children	Mothers of female children
Child's age	0.297*** [0.051]	0.005 [0.014]	0.228*** [0.055]	0.033** [0.015]
Child 12-14 year-old	0.238 [0.163]		0.117 [0.195]	
Mother's years of education (<i>ref. Illiterate</i>)	-0.069*** [0.025]		-0.055* [0.028]	
Read and write		-0.327* [0.171]		-0.146 [0.169]
Primary school		-0.128 [0.103]		0.032 [0.105]
Secondary school		-0.159 [0.153]		0.165 [0.145]
High school		0.377** [0.150]		0.445*** [0.146]
University and above		1.698*** [0.197]		1.895*** [0.214]
Mother's age	-0.105 [0.072]	0.124** [0.059]	0.009 [0.080]	0.148** [0.061]
Mother's age squared (x10 ⁻²)	0.109 [0.090]	-0.177** [0.077]	-0.03 [0.102]	-0.212*** [0.076]
Father's/husbands education	-0.056** [0.022]	0.015 [0.012]	-0.073** [0.032]	0.014 [0.012]

Father's/husband's age	0.145*	0.072	0.018	-0.023
	[0.075]	[0.060]	[0.070]	[0.057]
Father's/husband's age squared (x10 ⁻²)	-0.135*	-0.097	-0.02	0.036
	[0.078]	[0.069]	[0.074]	[0.061]
Father in public sector	-0.612***	-0.053	-0.301	-0.034
	[0.183]	[0.119]	[0.220]	[0.135]
Father private sector wage-earner	-0.084	-0.028	0.035	0.045
	[0.138]	[0.114]	[0.187]	[0.128]
No father/husband	3.364*	1.891	0.51	0.348
	[1.757]	[1.321]	[1.640]	[1.295]
No. of children ages 0-14 years	0.095*	-0.131***	-0.089	-0.028
	[0.054]	[0.047]	[0.064]	[0.056]
Household size	0.044	0.051	0.124***	-0.045
	[0.040]	[0.036]	[0.043]	[0.038]
HH agricultural establishment	0.241	1.266***	0.417**	1.356***
	[0.165]	[0.145]	[0.179]	[0.159]
HH non-agricultural establishment	-0.171	-0.04	0.038	0.168
	[0.156]	[0.125]	[0.187]	[0.142]
Poor rural household	-0.241	-0.143	-0.037	-0.226
	[0.180]	[0.162]	[0.163]	[0.169]
Poor urban household	0.270**	0.007	0.126	-0.012
	[0.116]	[0.091]	[0.160]	[0.089]
Rural	0.471***	0.797***	0.780***	0.825***
	[0.139]	[0.091]	[0.144]	[0.104]
Constant	-6.761***	-4.780***	-5.337***	-3.757***
	[1.577]	[1.106]	[1.745]	[1.112]
Rho		0.347		0.473
Wald test for rho=0 (p-value)		0.000		0.000
Number of observations		5,635		5,355

Note: Robust standard errors are in brackets. * significant at 10%; ** at 5%; *** at 1%

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