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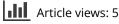
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Z. Bilgen Susanli, Ozlem Inanc-Tuncer and Serhat Kologlugil

Department of Economics, Işık University, Istanbul, Turkey

ABSTRACT

This paper takes an initial step in studying the determinants of child domestic labour and its relationship with mothers' employment in Turkey. We focus on children that are responsible for performing the domestic chores in their households. Using household level data from Demographic and Health Survey (2003), we find that the probability of child domestic labour is greater if the oldest child in the household is female; and this is stronger in rural areas. We also find that the likelihood of child domestic labour decreases with parental education. Our findings also suggest that the unobservable factors that increase the probability that a mother works increases the probability of child domestic labour in urban areas, but the opposite is true for rural areas.

1. Introduction

Substantial progress has been made in eradicating child labour both in the developing and the developed countries. Correspondingly, a large volume of empirical research has emerged to investigate the determinants of child labour. Typically, the term *child labour* is used to refer to children that work outside the home, in general for pay but sometimes without any payment. Official child labour statistics cover the economically active child population including the wage and salary employed, employers, own account workers, unpaid family workers as well as the unemployed. Most of the child labour that is unpaid takes place in family-owned enterprises, which makes it difficult to distinguish from household chores. In addition, children also perform non-market work, which refers to the provision of goods and services to household or community members. Household chores such as cleaning, cooking, and shopping constitute a large share of non-market work.[1] While work done at home is not counted in official child labour statistics, some studies document that it is a widespread phenomenon with its extent varying across countries (Edmonds & Pavcnik, 2005; Webbink, Smits, & De Jong, 2011). It has been found that in some countries the incidence of domestic work is much greater than market work.[2] Therefore, to understand child labour in its entirety, it is essential that both market and non-market work are taken into consideration. Hereafter, we refer to non-market work performed by children in the household as 'child domestic labour'.

CONTACT Z. Bilgen Susanli ✉ bilgen.susanli@isikun.edu.tr

A number of studies document that there is a negative association between child domestic labour and schooling outcomes in developing countries. Levison, Moe, and Knaul (2001) provide evidence that household responsibilities of Mexican girls interfere with their education and that gender gaps in education are wider when the traditional definition of child labour is extended to include domestic work. Admassie (2003) identify domestic and/or farm work as the top reasons for not attending school, both for girls and boys in Ethiopia. He reports that for 38% of girls aged 11–14, domestic work is the main reason for not attending school. Amin, Quayes, and Rives (2006) find that while market work reduces the years of education attained by rural boys, domestic work interferes with the schooling outcomes of girls in both urban and rural Bangladesh. Assaad, Levison, and Zibani (2010) find that performing substantial amounts of domestic work has detrimental effects on the school attendance of girls in Egypt.

This paper focuses on the determinants of child domestic labour in Turkey and its relation with employment of mothers. By child domestic labour, we consider the performance of household chores such as cooking meals, washing dishes, sweeping floors and similar tasks in a household. This topic is especially important for Turkey because a large and increasing share of children perform household tasks, despite the significant decline in child labour as measured by paid work since 1990s. Table 1 presents selected child labour force indicators from the Child Labour Force Surveys that were conducted by Turkish Statistical Institute (TUIK). Survey results indicate that the share of children between 6 and 17 years old in paid work dropped from 15% in 1994 to 10% in 1999, and stagnated at 6% in 2006 and 2012. This fall can be explained by a number of factors. Efforts to eliminate child labour have been on the agenda of Turkish government since Turkey joined the International Programme on the Elimination of Child Labour (IPEC), initiated by the International Labour Organization (ILO). In 1998, Turkey signed ILO Convention 138, which raises the minimum age for employment to 15 years. In addition, in 2001, Turkey ratified ILO Convention 182 which requires the prohibition and the elimination of worst forms of child labour covering all children younger than 18 years of age. Moreover, the education reform that extended compulsory schooling from 5 to 8 years in 1997 has been effective in the prevention of child labour (Dayioglu, 2005).

Despite the efforts to eliminate child labour, an increasingly large share of children still perform domestic chores. Table 1 also shows that the share of children engaged in household chores rose significantly from 28% in 1999 to 44% in 2006, and to 49% in 2012. The increase in the share of children has been common to both urban and rural regions. As expected, a greater share of girls are engaged in domestic work than boys in both regions. While 42% of all boys are engaged in household chores in 2012, this is 57% for all girls. In addition, doing housework seems to be more common among older girls than younger ones. As of 2012, 52% of the girls aged 6–14 are engaged in household chores. This share is 73% among the 15–17 year-olds. Although some may argue that helping parents with household chores may not always compete directly with schooling and the time they devote to leisure, in this study we are able to identify the cases where children carry the main responsibility for household chores which, we believe, will impede their ability to do homework and to play and rest. Indeed, recent studies summarised above document that excessive amounts of domestic work performed by children have negative effects on school attendance. In addition, it is easy to imagine that some forms of domestic work such as cooking or ironing may even be dangerous or exhausting for children.

Table 1. Children by age group, sex and type of work.

	Number of children (in thousands)				Engaged in economic activity (%)				Engaged in household chores (%)					Not working (%)		
	1994	1999	2006	2012	1994	1999	2006	2012	1994	1999	2006	2012	1994	1999	2006	2012
Turkey																
Age group and sex																
Total	14,968	15,821	15,026	15,247	15	10	6	6	-	28	44	49	-	61	51	45
6–14	10,945	11,938	11,378	11,386	9	5	3	3	24	26	40	46	67	69	58	51
15–17	4,023	3,883	3,647	3,861	33	26	17	16	-	36	56	57	-	38	28	27
Male	7,628	8,021	7,677	7,775	18	12	8	8	-	15	34	42	-	73	58	50
6–14	5,584	6,054	5,809	5,794	10	6	3	3	16	15	32	41	74	79	65	55
15–17	2,044	1,968	1,868	1,981	39	31	22	22	-	14	39	43	-	55	39	36
Female	7,340	7,800	7,349	7,472	12	9	4	4	-	42	54	57	-	50	42	39
6–14	5,361	5,885	5,569	5,592	7	5	2	2	34	37	47	52	59	59	51	46
15–17	1,979	1,915	1,780	1,880	26	21	11	9	-	58	74	73	-	21	15	18
Urban																
Age group and sex																
Total	7,858	9,010	10,160	10,139	8	5	5	4	-	32	46	54	-	63	49	42
6–14	5,761	6,729	7,599	7,567	3	2	2	1	26	29	42	51	4,068	70	56	48
15–17	2,097	2,280	2,560	2,572	20	16	14	13	-	40	56	62	-	43	29	26
Male	4,021	4,585	5,294	5,157	12	8	7	6	-	19	37	48	-	73	56	46
6–14	2,917	3,386	3,926	3,845	5	2	2	1	17	20	36	48	2,280	78	62	51
15–17	1,104	1,200	1,367	1,312	31	23	20	19	-	17	41	48	-	59	39	33
Female	3,837	4,425	4,866	4,982	3	3	3	2	-	45	55	61	-	53	42	37
6–14	2,844	3,344	3,673	3,722	2	1	1	1	36	38	49	55	1,789	61	50	44
15–17	993	1,081	1,193	1,260	9	8	8	6	-	66	74	76	-	26	18	18
Rural																
Age group and sex																
Total	7,110	6,812	4,866	5,108	23	17	8	10	-	24	38	40	-	59	53	51
6–14	5,184	5,209	3,779	3,819	15	10	4	6	23	22	34	37	3,240	68	62	58
15–17	1,926	1,602	1,087	1,290	46	41	22	22	-	29	54	48	-	31	24	30
Male	3,607	3,436	2,383	2,618	25	17	10	12	-	10	26	30	-	73	64	58
6–14	2,667	2,668	1,883	1,948	16	10	5	7	15	10	24	29	1,854	80	71	64
15–17	940	768	500	669	50	43	27	28	-	9	32	32	-	48	41	41
Female	3,503	3,375	2,483	2,491	22	17	6	7	-	38	51	50	-	45	43	43
6–14	2,517	2,541	1,896	1,870	14	9	3	5	31	35	44	44	1,385	55	53	51
15–17	986	834	587	620	42	38	17	15	-	47	73	66	-	15	10	18

Source: TUIK, Child Labour Force Statistics, 1994, 1999, 2006, 2012.

Table 2. School attendance of children by age and type of household.

	Households with child domestic labour				Households with no child domestic labour			
	Girls		Boys		Girls		Boys	
	At school	Not at school	At school	Not at school	At school	Not at school	At school	Not at school
Age 6–15	73.4	26.6	85.2	14.8	87.4	12.6	90.8	9.2
Age 16–18	30.0	70.0	56.7	43.3	60.4	39.6	70.0	30.0

Source: TDHS-2003.
Each entry represents the percentage of the corresponding gender and age group attending school at the time of the survey.

Table 3. Household chores by gender of child.

Household chore	Girls	Boys
Cooking	7.1	0.0
Setting the table	53.5	1.7
Wiping floors	43.1	0.7
Washing dishes	43.1	0.0
Ironing	40.5	1.0
Grocery shopping	3.7	1.7
Household budgeting	0.0	1.0
Paying bills	3.0	10.7
Observations	295	295

Source: TDHS-2003.
Numbers in cells reflect the percentage of cases where the task is performed by girls or boys in the sample of households where a child is responsible for at least one household chore.

In 2012, about 4.3 million female children were engaged in domestic work in Turkey (Table 1). Of these 4.3 million girls, about 22% were not at school, as opposed to 18% of total female children (not in table). In line with these figures, Table 2 shows that in our sample school attendance is lower in households where child domestic labour is observed. In 9.6% of households in our sample, at least one household chore is the main responsibility of a child and in only 1% of these households is this done by boys. For instance, Table 3 indicates that in 53.5% of the households where we observe at least one form of child domestic labour, daughters are the main responsible for setting the table and in about 43% of those households, daughters are responsible for wiping the floor and washing the dishes. Clearly, child domestic labour is almost entirely observed among female children in Turkey.

Studies on child labour in Turkey mainly focus on child labour in the form of paid work. Dayioglu and Assaad (2003) study the relationship between child labour and parental wages and find that employment of children is affected by paternal but not maternal wages. They document that maternal education is effective in withdrawing female children from the labour market. Using data from 1994 and 1999, Dayioglu (2005) finds that the extension of compulsory schooling and the ban on child labour have been effective in reducing child labour and improving schooling outcomes. In addition, Dayioglu and Assaad (2003) and Dayioglu (2006) identify poverty as the main determinant of child labour in Turkey. Using data from the 1994 and 1999 waves of Child Labour Force Surveys, Dayioglu (2008) establishes that employment decisions of mothers and children are positively related and that this relationship is stronger for female children. Finally, using data from the Child Labour Force Survey 2006, Kiral and Tiras (2013) also find that parental education and father's wage are significant determinants of the labour force participation of children.

In line with the findings of Admassie (2003), Amin et al. (2006) and Assaad et al. (2010), we conjecture that imposing household responsibilities to school-age children interferes, at least, with their school attendance and their success at school. To our knowledge, our paper is the first to take into consideration the domestic work performed by children and its relation with mothers' employment in Turkey. We approach the problem of child labour from a perspective that is distinguished by two aspects. First, we focus on a specific dimension of the problem that is often underexplored mainly due to data limitations. Most studies exclude household chores from child labour due to lack of data. Hence, much of the literature on child labour is confined to the traditional understanding of child labour as economic activity in which children are engaged within formal or informal market structures. However, it can hardly be said that domestic work is less significant than market work in terms of its detrimental effects on child development. Our focus is on the cases where children are the main provider of household chores. The second important aspect of our approach is that we analyse child domestic labour in its relation to mothers' labour market status. As UNICEF's 'The State of the World's Children' reports indicate, there has been a growing international interest in understanding how children's and their mothers' conditions are related to each other (UNICEF, 2007, 2008, 2009). This is especially important in Turkey given the historically low female labour force participation rates.[3] In order to address this issue, several government policies have been introduced.[4] Therefore, with policies designed to encourage the participation of women in the labour force, it is essential to consider mothers' labour force decisions together with child domestic labour.

Theoretically, the relationship between mothers' labour market status and child domestic labour is unclear. On the one hand, one could surmise that a mother's and her child's labour are substitutes within the household. It may very well be the case that when mothers enter the labour market, daughters may drop out of school and take up the household chores at home (Grootaert & Kanbur, 1995; Self, 2011). Consequently, one would expect a rise in child domestic labour as more mothers join the labour market. This is the *substitution effect* as defined in Self (2011). On the other hand, as the mother participates in the labour market, the economic condition of the household improves, which may help decrease the burden of housework on daughters. *The income effect*, defined as such in Self (2011), would operate in the opposite direction. Therefore, the net effect depends on which one dominates.

At the cross country level, a positive correlation between child labour and female labour force participation is documented (Saad-Lessler, 2010). Studies that use individual level data find suggestive evidence for the positive correlation between mothers' labour force participation and child labour in a number of developing countries (DeGraff & Levison, 2009; Edmonds & Pavcnik, 2005; Francavilla & Giannelli, 2010; Self, 2011).

We use micro data from the 2003 Turkey Demographic and Health Survey. The Demographic and Health Surveys collect rich information on individual and household characteristics. In particular, the survey questionnaire includes a question on the main, the second and the third person responsible for several types of domestic chores, such as cooking, setting the dinner table, cleaning the house, washing the dishes, doing the laundry, ironing, grocery shopping, calculating household budget and paying the bills.

We model the likelihood of child domestic labour and employment of mothers jointly using a bivariate probit model. In line with our expectations, our results suggest that the likelihood of child domestic labour is greater in a household if the oldest child is female and

this gender effect is stronger in rural areas. Findings also indicate that parental education is negatively associated with child domestic labour in both urban and rural areas. In addition, a larger household size is found to increase the employment probability of mothers as well as the probability of child domestic labour. Interestingly, while education increases the likelihood of employment of mothers in urban areas, fathers' education is found to have the opposite effect. We also find suggestive evidence that mothers' employment and child domestic labour decisions are not independent, which supports the choice of our econometric methodology.

The paper is structured as follows. The next section summarises the dataset and the methodology. In the subsequent section we present our results. The final section concludes and discusses policy implications.

2. Data and empirical methodology

We use micro data from the 2003 Turkey Demographic and Health Survey, (TDHS-2003). In particular, we explore data from the two different samples of the TDHS-2003 dataset. The first one includes information on 10,836 households that responded to the Household Questionnaire. The second one surveys 8,075 ever-married women that are also members of the household sample.

The household sample covers households from both the urban and rural areas as well as different geographical regions of Turkey grouped into west, south, central, east and north. The survey collects detailed information on household structure, the type of residence, migration, literacy, schooling, employment status and marital status of individuals. Among the female respondents of the household questionnaire, 8,075 ever-married women of ages 15–49 took part in the Individual Questionnaire. This survey collects information, among other things, on marriage, fertility preferences, contraception methods, pregnancy and nursing as well as labour market status. We generate our final sample by merging the household sample with data from ever-married women sample. The ever-married women survey also collects information regarding the performance of several household chores. In particular, women are asked to report the top three persons responsible for: cooking, setting the dinner table, cleaning the house, washing the dishes, doing the laundry, ironing, grocery shopping, calculating household budget and paying the bills in the household. We are mainly interested in the cases where mothers report that either a daughter or a son is the main provider (i.e., the first responsible) for a household chore. By using this information, we generate an indicator of child domestic labour. Our indicator variable for child domestic labour equals one if the mother reports that either a son or a daughter is the main responsible person for at least one of the household chores, and zero otherwise. Our second outcome variable is a binary variable that equals one if the mother reports being currently employed, and zero otherwise. This variable is generated from the responses of women in the ever-married sample.

Our dataset shows that of all the 22,443 observations coming from the children of surveyed women, 3,915 of them (about 17%) live in households where a child is the main person responsible for performing at least one household chore. At this point, we must note that a shortcoming of our data is that the survey questionnaire does not ask the mothers to identify the child that is responsible for the household chore in question. Therefore, we have no information on the age of the child that is the main person responsible for housework.

If, for instance, a mother reports that her daughter is the main person responsible for washing the dishes and there are two daughters of ages 12 and 25 in that household, then there would be no child domestic labour if the mother identifies the older daughter as the one doing the housework. To address this, we restrict our sample to the households where the oldest child is 17 years old.[5] While doing this reduces the sample size, our findings can be considered as a lower limit for the actual incidence of child domestic labour. Although one can initially be concerned that doing so restricts our sample to households where mothers tend to be younger, we are relieved by the fact that the median age of mothers in the restricted and unrestricted samples are equal. With this restriction, our final sample consists of 3,090 households with a complete set of control variables.

Since information about the incidence of child domestic labour is available only at the household level, our analyses are at the household level and cannot control for individual characteristics of the children in the household. Therefore, we control for the gender of the oldest child, whom we conjecture to be the main, if not the only, person responsible for household chores in households with child domestic labour.[6] We control for the mother's age and years of schooling. We also control for the father's years of schooling. Although this variable is expected to be highly correlated with the mother's years of schooling, it may serve as a proxy for the family's social status.

Among the household characteristics that are expected to affect both the mother's employment and child domestic labour are the presence of grandparents in the household and household size. To account for the presence of grandparents, we control for a dummy variable, *Grandparents in the household*, which equals one if a grandparent is reported to live in the same household. We expect that holding household size constant, the presence of a grandparent may lower the load of child care for mothers and thereby raise their likelihood of employment and lower the likelihood of child domestic labour. While a larger number of individuals in the household will raise the probability of child domestic labour as it increases the amount of household chores, it is likely to have two different effects on the probability of mothers' employment. On the one hand, mothers in larger households may be burdened with a greater load of household chores that may prevent them from participating in the labour force. On the other hand, mothers may have to work in the market to support the greater economic demands of a larger family size. Holding household wealth or parental human capital constant, household size may also be considered as a measure of poverty as larger households would have fewer resources per capita (Orazem & Gunnarsson, 2004).

We also control for monthly household income provided in brackets. In addition, we control for a dummy variable that equals one if the family is dependent on relatives for their livelihood, *Family depends on relatives economically*. This variable may capture information regarding the asset holdings of the households since it is reasonable to expect that families sell their assets off when they become income-poor before resorting to relatives for livelihood.[7] Estimations also include a dummy variable for urban areas. Urban areas are those that have a population greater than 20,000.

Table 4 presents the summary statistics in our working sample. In 9.6% of households in the sample at least one child assumes the main responsibility of (at least) one household chore and 36.6% of the mothers in our sample work (not in the table). Mothers in households with child domestic labour are more likely to work. While 45% of mothers in households with child domestic labour are employed, this share is 36% in households with no child domestic labour. This suggests that children take up household chores while their

Table 4. Summary statistics.

Variable	Child domestic labour		No child domestic labour	
	Mean	Std. Dev.	Mean	Std. Dev.
Mother works (d)	0.45	0.50	0.36	0.36
Mother's age	35.67	4.25	32.92	32.92
Mother's years of schooling	3.51	3.22	5.62	5.62
Father's years of schooling	5.89	3.26	7.75	7.75
Grandparents in the household (d)	0.68	0.47	0.61	0.61
Household size	6.41	2.80	5.23	2.17
Oldest child female (d)	0.74	0.44	0.48	0.50
Household Income btw 0 and 150 mil. TL (d)	0.20	0.40	0.11	0.31
Household Income btw 150 and 300 mil. TL (d)	0.29	0.45	0.17	0.37
Household Income btw 300 and 450 mil. TL (d)	0.22	0.41	0.27	0.17
Household Income btw 450 and 600 mil. TL (d)	0.15	0.36	0.18	0.00
Household Income btw 600 and 750 mil. TL (d)	0.04	0.21	0.09	0.27
Household Income btw 750 and 1 bil. TL (d)	0.06	0.24	0.10	0.18
Household Income greater than 1 bil. TL (d)	0.04	0.21	0.10	0.09
Family depends on relatives economically (d)	0.05	0.22	0.07	0.10
Urban (d)	0.62	0.49	0.75	0.10
Number of observations	295		2,795	

Source: TDHS-2003.
d – Denotes dummy variables.

mothers are at work. Households with child domestic labour are on average larger. In line with expectations, parents in households with child domestic labour have fewer years of schooling. In about 74% of the households with child domestic labour, the oldest child is female. In addition, in 49% of the households with child domestic labour, the total monthly income is below 300 million Turkish Liras. This is about 28% for households with no child domestic labour. Considering that the gross minimum wage for adults over 16 years old was 305 million Turkish Liras in 2003, this might highlight the role poverty plays in child labour outcomes. About 5% of the households with child domestic labour are dependent on relatives economically. This is 7% for households with no child domestic labour.

Following Francavilla and Giannelli (2010), we assume that the child's time is an extension of mother's time. Our outcome of interest is the joint determination of mother's employment status and child domestic labour. Therefore, we follow Dayioglu (2008) and use a bivariate probit model to estimate the probability of child domestic labour and the probability that the mother is employed. The reduced form equations for the two outcome variables are the following:

$$M_i^* = X_i\beta + \varepsilon_i$$

$$M_I = 1 \; if \; M_i^* \geq 0, \; and \; zero \; otherwise. \tag{1}$$

$$C_i^* = Z_i\delta + \mu_i$$

$$C_i = 1 \; if \; C_i^* \geq 0, \; and \; zero \; otherwise \tag{2}$$

where C_i^* and M_i^* are latent variables that determine the likelihood that we observe child domestic labour and that the mother is employed in household i, respectively. X and Z are vectors of child, parental and household characteristics that are expected to explain the outcome variables. The disturbances ε_i and μ_i are assumed to be jointly distributed as bivariate normal with zero means, unit variances and a correlation coefficient of ρ.

The bivariate probit model is essentially two separate probit models with correlated error terms. The advantage of using a bivariate probit model is twofold. First, it enables us to see whether a control variable has the same effect on the two outcome variables. Second, it allows us to treat these two decisions as joint through the unobserved characteristics that potentially affect the two outcomes, while it does not require an ordering of these decisions. An example of such unobservable factors may be the opinion of mothers about gender roles. For instance, it could very well be the case that mothers that believe that a woman's primary responsibilities are child care and housework also believe that women should work only when they have to. Therefore, these mothers will be more likely to impose the household responsibilities on their children, especially daughters, when they work. In this case, the correlation coefficient, ρ, would be positive.

3. Results

Table 5 reports the average marginal effects from the bivariate probit estimation results. The first two columns in Table 5 display the mothers' employment and child domestic labour in the pool of urban and rural areas. Our results suggest that mothers' and fathers' education are negatively associated with the likelihood that a child takes on household responsibilities. In line with expectations, the likelihood of child domestic labour is greater in a household if the oldest child is a female. In particular, the probability of observing child domestic labour is on average 12.4 percentage points higher if the oldest child in the household is a female. Children in larger households are also more likely to assume household responsibilities. The average marginal effects of household income variables are all negative except for the income bracket of 150–300 million TL, but not all of them are statistically significant. In addition, economic dependence on relatives is found to decrease the likelihood of child domestic labour. This result is in contrast with the finding in Dayioglu (2006) that there is a negative association between poverty and child labour in the form of market work.

The average marginal effects of the mother's employment equation are given in column (2). We find that while the mother's years of schooling has a positive and significant effect on her employment probability, the father's education reduces it. Results also show that mothers are more likely to be employed as they get older. We also find that household size has a positive and statistically significant marginal effect. This may reflect the need for an extra income source to support a larger family. Mothers in urban areas are significantly less likely to work, which accords well with the higher employment rates of women in rural areas due to the predominance of unpaid family work. By estimating a bivariate probit model, we are able to measure the correlation between the unobservable factors that affect the mothers' employment and child domestic labour. The correlation coefficient rho is positive and significant at $p<0.10$. This implies that unobservable factors that affect the child domestic labour and mothers' employment are positively correlated.

Since employment opportunities and the characteristics of the jobs differ substantially across urban and rural areas, we run the estimations separately for urban and rural areas.

Table 5. Bivariate probit estimation – average marginal effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	Urban & Rural		Urban		Rural	
Outcome variable	Domestic child labour	Mothers' employment	Domestic child labour	Mothers' employment	Domestic child labour	Mothers' employment
Mother's years of schooling	-0.012**	0.027**	-0.012**	0.030**	-0.011+	0.010
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.007)
Father's years of schooling	-0.006*	-0.006*	-0.005+	-0.008**	-0.010+	-0.003
	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)
Mother's age	0.016**	0.010**	0.016**	0.008**	0.019**	0.012**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Oldest child female	0.124**		0.104**		0.197**	
	(0.015)		(0.018)		(0.029)	
Grandparents in the household	-0.012	0.014	-0.025	-0.007	0.006	0.100*
	(0.016)	(0.018)	(0.019)	(0.020)	(0.036)	(0.040)
Household size	0.015**	0.009*	0.020**	0.013*	0.008	-0.001
	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)	(0.006)
Household Income btw 150 and 300 mil. TL	0.027		0.061+		-0.011	
	(0.023)		(0.035)		(0.035)	
Household Income btw 300 and 450 mil. TL	-0.048*		-0.020		-0.078*	
	(0.024)		(0.033)		(0.039)	
Household Income btw 450 and 600 mil. TL	-0.024		-0.003		-0.047	
	(0.027)		(0.036)		(0.050)	
Household Income btw 600 and 50 mil. TL	-0.085*		-0.066		-0.071	
	(0.037)		(0.044)		(0.085)	
Household Income btw 750 and 1 bil. (TL)	-0.030		-0.004		-0.025	
	(0.034)		(0.042)		(0.084)	
Household Income greater than 1 bil. (TL)	-0.024		0.027		-1.274**	
	(0.041)		(0.051)		(0.109)	
Family depends on relatives economically	-0.071*		-0.151**		-0.001	
	(0.033)		(0.057)		(0.047)	
Urban	-0.019	-0.347**				
	(0.016)	(0.016)				
Correlation of errors, (rho)	0.08		0.19		-0.15	
Wald test of rho=0:	Pr> chi2 = 0.089		Prob > chi2 = 0.001		Prob > chi2 = 0.057	
Observations	3,090	3,090	2,287	2,287	803	803

Source: THDS-2003.

Average marginal effects from estimating equations (1) and (2). Omitted categories are oldest child male, income less than 150 million TL, no grandparents in the household and rural areas. Robust standard errors in brackets.

+significant at 10%.
*significant at 5%.
**significant at 1%.

Columns (3) and (4) provide the results for the urban subsample. Almost all of the average marginal effects have the same signs as they had in columns (1) and (2) except for the household income bracket greater than 1 billion TL. We find that the likelihood of child domestic labour is significantly higher for households with income between 150–300 million TL relative to the base category of below 150 million TL. Although the average marginal effects of higher levels of household income are negative, they are imprecisely estimated. Columns (5) and (6) present the results for the rural subsample. The average marginal effect of the gender of the oldest child is positive and significant, also larger compared with that in the urban sample. In addition, the variable that captures economic dependence on relatives is imprecisely estimated. In explaining the likelihood of mothers' employment, neither the mother's own education nor the father's education has a statistically significant effect. The average marginal effects of the mother's age and presence of grandparents in the household are positive and statistically significant. Interestingly, the correlation coefficient, ρ, switches sign and becomes negative. This implies that the unobservable factors that increase mothers' employment probability in rural areas reduce the likelihood of child domestic labour. This finding suggests that different factors may be at work in explaining female employment across urban and rural Turkey.

Finally, one can argue that availability of household appliances may significantly affect the load of household chores and hence influence the likelihood of child domestic labour and mothers' employment.[8] To test the sensitivity of our results, we control for the ownership of at least one of the following household appliances: a dishwasher, a washing machine and a vacuum cleaner. Results (not presented here) show that availability of household appliances is not a significant determinant of child domestic labour and employment of mothers.

4. Conclusion

This paper aims to serve as a useful starting point for understanding the relationship between mothers' employment and child domestic labour in Turkey. Our results suggest that child domestic labour is best dealt with by taking into account its gender dimension. We find that the probability of child domestic labour is significantly greater if the oldest child is a female. We also document that the unobservable factors that increase the probability that a mother works increase the probability that we observe child domestic labour in urban areas, and the opposite for rural areas. It is also worth noting that our results support our assumption that child domestic labour and mothers' employment decisions are made jointly.

These findings may be of interest for policymakers in Turkey for a number of reasons. First, household income appears to be an important factor. Second, policies that encourage women's participation in the labour force should be designed depending on the location of the target groups since the desirability of the results is likely to depend on the location of the programmes. Third, the fact that parental education, especially that of the mother, is very effective in reducing child domestic labour, should be taken into consideration in designing the education reforms.

Finally, our results have further implications for the effectiveness of campaigns that aim to increase school enrolment. Such campaigns have recently been largely successful and the net primary school enrolment ratio has almost reached 100% in Turkey. As promising as the figures are, our findings suggest that education indicators in Turkey should not be interpreted without considering the prevalence of child domestic labour. For instance, if

children devote the time that they spend at home to household chores instead of studying, high enrolment ratios will not necessarily translate into an increase in the quality of the education they receive. Therefore, recent policies geared towards increasing the enrolment rates of female children should also include measures that define child domestic labour as a component of the problem by taking into account the time allocation of children.

Notes

1. We use household chores and domestic work interchangeably.
2. Edmonds and Pavcnik (2005) document that in 2000, among 124 million children from 36 countries, the incidence of domestic work was 65% while the incidence of market work was 15%. Participation rate in any type of work (market or domestic) was estimated to be 68%. Using data from two states of India, Basu, Das, and Dutta (2010) document that excluding domestic chores and domestic labour outside the household from child labour greatly underestimates its extent.
3. In 2014, female labour force participation was 33.6 per cent which was the lowest among the OECD countries.
4. In 2003, amendments were made to the New Labour Act, No. 4857 in order to ensure equal treatments and more equal rights for men and women in the labour market. In addition, in 2008 with the aim of encouraging the employment of women, amendment of the Labour Act and Other Acts, No. 5763 provided gradual exemption from the employee-contributions of the social security premiums for employing women that are aged between 18 and 29 and that have no social security insurance within one year of the enactment of that legislation. Moreover, the National Action Plan for Gender Equality covering 2008–2013 emphasises the importance of improving gender equality in many aspects of social and economic life including access to education and health, and labour force participation.
5. According to the International Labour Organisation's Convention no 138, the basic minimum age for employment and hazardous work is 15 and 17, respectively.
6. This conjecture is in line with the findings of Edmonds (2006) that older girls tend to work more hours both in market work and domestic work than boys. Findings in Edmonds (2006) also show that older girls work more hours than their younger sisters in Nepal. Alvi and Dendir (2011) also document that earlier-born girls are more likely to do domestic work in Ethiopia.
7. Dayioglu (2006) documents that the incidence of child labour is higher among families that are asset-poor.
8. Coen-Pirani, León, and Lugauer (2010) document that the diffusion of home appliances between 1960 and 1970 contributed to the increase in the labour force participation rates of married women in the US.

Disclosure statement

No potential conflict of interest was reported by the authors.

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