GENDER DIFFERENCES IN TIME ALLOCATION OF POOR CHILDREN IN COLOMBIA

Juan Miguel Gallego
Carlos E. Sepulveda

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Juan Miguel Gallego[1] and Carlos E. Sepulveda[2]

Abstract:

This paper studies the effect of credit constraints and constraints on transfers between parents and children, on differences in labor and schooling across children within the same household, with an application to gender. When families are unconstrained in these respects, differences in labor supply or education are driven by differences in wages or returns to education. If the family faces an imperfect capital market, the labor supply of each child is inefficient, but differences across children are still driven by comparative advantage. However, if interfamily transfers are constrained so that parents cannot offset inequality between their children, they will favor the human capital accumulation of the more disadvantaged child -generally the one who works more as a child. We use our theory to examine the gender gap in child labor. Using a sample of poor families in Colombia, we confirm our predictions among rural households, although this is less clear for urban households. The gender gap is largely explained by the wage gap between girls and boys. Moreover, families with the potential to make capital transfers to adult children (e.g. those with large animals), can compensate adult sons for their greater child labor and reduced educational attainment. In such families, as predicted, the male/female labor gap is greater.

Keywords: Child labor, schooling, credit constraints.

JEL classification: J13, J16, J22, J24

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[1]Department of Economics. Universidad del Rosario. Bogotá. E-mail: juan.gallego@urosario.edu.co

[2]Departamento Administrativo Nacional de Estadisticas. DANE - Colombia. E-mail: casepulve@gmail.com

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1 Introduction

Imperfect capital market and poverty combine to generate inefficiently high levels of child labor. Families facing imperfect capital markets cannot smooth their consumption and respond by having their children work in order to increase current consumption. Additionally, when parents do not leave positive transfers to their adult children, the labor supply of each child is inefficiently high. The last source of inefficiencies is generated by an agency problem because parents, who choose their children's time allocation, do not fully internalize the benefits and costs of these decisions when they cannot adjust intra-family transfers to or from their adult children (Baland and Robinson, 2000).

While these effects are well established in the theoretical and empirical literature, it is less clear how they influence the intrahousehold allocation of children's time. In particular, these models have not addresses the educational attainment and child labor of boys and girls, despite evidence that girls and boys differ in the incidence of work activities (income-generating and domestic activities) and education, albeit that the difference varies across countries[3].

We study gender differences in time allocation among poor children. In particular, we look at the effect of credit constraints and limited intrafamily transfers on gender differences in labor supply and education. In the absence of such constraints differences in labor supply and education are driven by children's wages and the return to schooling. We show that if the family faces imperfect capital markets, the labor supply of each child is inefficient but similar to the first best solution, in the sense that differences across children within the household are still driven by wages and the benefit of human capital accumulation. If parents do not leave transfers to their children and cannot impose transfers from their adult children, the level of labor supply is inefficiently high. Moreover, the family does not fully exploit the comparative

[3]Evidence on the gender gap in education and work activities has been reported by several authors [see (Edmonds, 2007) for a complete survey]. In many cases girls are the unfavored members within the household; for intance in Asian countries the gender gap in schooling against girls is very significant (Bhatrola, 2007). However, in some Latin American countries such as Brazil and Colombia, girls are the favored group within households in both schooling and income generating activities (Guarcello *et al*, 2006).

advantage of its children; instead, such families adjust child labor supply to reduce the differences in adult outcomes among the children.

We test the theory using a sample of impoverished households in Colombia. In our sample, girls get more education than boys do. This difference is explained mainly by differences in wages, which also explain part of the gap in child labor. This is true both for families that appear to have access to credit and those that do not. In rural families with more animals, a likely source of intergenerational transfers, the gender differences increase, as predicted by the theory.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 presents the theory and its empirical implications. Section 4 describes the data. Section 5 shows some basic empirical results on the determinants of labor supply. Section 6 shows how the gender gap changes with constraints. Finally in section 7 we conclude.

2 Background and Related Literature

Child labor is usually a sign of extreme poverty and also reinforces the already existing unfavorable conditions that working children face, with deep and sometimes irreversible consequences for their future. Children work to contribute to their families' resources, but this takes time away from school and other activities, which are essential for the children's development.

An enormous effort has been made to understand child labor (Edmonds, 2008). The theory of child labor considers a wide range of determinants of school attendance and child labor. From a human capital perspective (Becker, 1981), the child labor decision depends on the relative net returns to different child activities (education, home production, formal labor tasks and play). The way such returns are perceived is influenced by a number of factors. Poverty status, for instance, can alter the discounting of future net benefits of a child's current actions. Credit market imperfections may lead to an inefficiently high level of child labor (Baland and Robinson, 2000). The marginal return to each activity also depends on family structure or social norms. For example, older children in the household are relatively more productive at formal labor tasks than younger ones (Edmonds, 2006).

Additionally, children's time allocation is a household decision which involves the

interaction of different family members. Parents are central in the process, and the costs and benefits of the children's actions are borne by each person within the household in a different way. The final outcome may be the result of an intrahousehold bargaining process (Basu, 2006). The parents' inability to incorporate disutility of labor for the child (Bommier and Dubois, 2004) or the difficulty of making commitments that bind over generations (Udry, 2006) can again lead to inefficiencies.

Moreover, there are persistent systematic differences between boys and girls in school attendance, domestic work, and fields of work outside the house, but there are still few studies focusing on gender differences.

Our paper is related to three branches of the literature. The first is the unitary model of household resource allocation among members within a household. This literature shows that in a static model households can achieve efficient decisions regarding human resource allocation if parents are not restricted from leaving transfers to their children (Becker and Tomes, 1986). However, if parents are not wealthy enough to leave positive transfers to their children, households may reinforce or compensate differences in outcomes created by differences in human capital formation (Berhman *et al*, 1995). We extend this literature by endogenizing the labor supply of children.

The second branch of literature concerns the determinants of child labor (e.g. Baland and Robinson, 2000). The paper closest to ours, Horowitz and Wang (2004) considers families with heterogeneous children and shows that families cannot exploit the comparative advantage of their children when parents do not leave positive bequests to their children. Our work differs from Horowitz and Wang in two dimensions. First, we also look at credit constraints. Second, we test our theoretical predictions with data on poor families in Colombia.

Finally, since our data set provides information on who is the decision-maker, we address decisions in households with more than one member. If mothers get more disutility from child labor, then according to the intrahousehold bargaining model, the higher the power of the father within the household, the higher the level of labor supply of the children. In addition, if parents place more utility weight on children of their own sex, we predict outcomes will depend on the distribution of bargaining power. We do find a large differential effect of sex of the decision-maker on girls, but it does not explain the observed gap in education or labor participation.

3 Theory

In this section we provide a simple theoretical set-up in order derive our empirical predictions about gender differences in child labor.

Each household is composed of an adult (or a set of adults with similar preferences whom we call parents) and two children ($i = 1, 2$)[4]. The decision maker chooses the child's labor supply (l_i). Each child lives for two periods. During the first period, each child i has one unit of time to be distributed between labor and schooling . In the second period, each adult child has earnings that depend on first period schooling. The children may differ on two dimensions, returns to education and wages. When child i spends l_i time on work activities she/he earns $w_i l_i$ in the first period, where w_i is the wage of the child. The labor supply of the child in the first period affects the earnings of the child in the second period $h(1 - l_i; e_i)$. This function $h(.)$ is strictly increasing and concave in $1 - l_i$. Parameter e_i affects how much is learned in school. We assume that higher e_i implies higher adult earnings for a given time devoted to schooling ($\frac{\partial h(1-l_i;e_i)}{\partial e_i} > 0$).

The household lives two periods and individuals do not discount. For the first period, the entire family is treated as a single consumption unit and its total consumption is denoted by c_f. In the second period, there are three different consumption units, as the parents and the children each go their own way. We denote c_i as the adulthood consumption of adult child i and c_p as the parent's consumption during period 2. Parents take into account family utility in both periods and the weight of child i's utility on their welfare. Formally the objective function of parents (family) is $W = U_f(c_f) + U_p(c_p) + \sum_{i=1}^{2} \delta_i V_i(c_i)$. The functions $U_j(c_j), \forall j = f, p$ and $V_i(c_i), \forall i = 1, 2$ are increasing and concave[5]. The weight of child i's welfare on the parents utility is captured by the altruism parameter $\delta_i \in (0, 1), \forall i = 1, 2$.

During the first period, family consumption, c_f, is equal to the parents' income A (exogenous), plus the labor income of each child $w_i l_i$, less savings s, $c_f = A +$

[4]This paper considers fertility as exogenous. Baland and Robinson(2000) considers child labor with endogenous fertility.

[5]We assume that children's labor does not enter directly on the utility of parents. Bommier and Dubois (2004) considers disutility of child labor in the utility function of parent. By introducing disutility they found additional inefficiencies on the level of child labor, in the sense that even if the family is unconstrained the levels of labor supply of children are inefficient.

$\sum_{i=1}^{2} w_i l_i - s$. In the second period, parents' consumption, c_p, is equal to parents income A, plus savings, less transfers that parents leave to each child b_i(transfers can be interpreted as bequest), $c_p = A + s - \sum_{i=1}^{2} b_i$. In addition, the consumption of each child c_i is equal to the market value of her/his human capital formation $h(1 - l_i; e_i)$ plus parents' transfers b_i, $c_i = h(1 - l_i; e_i) + b_i \;\; \forall i = 1, 2$.

Parents maximize the welfare of the household subject to the budget constraints and, possibly to credit ($s \geq 0$) and bequest constraints ($b_i \geq 0$). We assume that parents choose interior solutions for the labor supply of each child. Then, the first order conditions with respect to l_i, s and b_i are:

$$\frac{\partial U_f(c_f)}{\partial c_f} w_i - \delta_i \frac{\partial V_i(c_i)}{\partial c_i} \frac{\partial h(1 - l_i; e_i)}{\partial l_i} = 0 \quad \forall i = 1, 2$$

$$\frac{\partial U_f(c_f)}{\partial c_f} = \frac{\partial U_p(c_p)}{\partial c_p} + \lambda$$

$$\frac{\partial U_p(c_p)}{\partial c_p} = \delta_i \frac{\partial V_i(c_i)}{\partial c_i} + \mu_i, \quad \forall i = 1, 2$$

$$\lambda s = 0$$

$$\lambda \geq 0$$

$$\mu_i b_i = 0, \quad \forall i = 1, 2$$

$$\mu_i \geq 0, \quad \forall i = 1, 2$$

From the general first order conditions we can analyze different special cases. The first case considers households under perfect capital markets (no credit constraints) and with enough assets to leave transfers to their children (no bequest constraints). This case gives the Pareto efficient outcome, which implies that parents should choose each child's labor supply such that the marginal wage increase from schooling is equal to the wage (the marginal cost of reducing labor supply). Formally, it implies that the Kuhn-Tucker multipliers on the constraints on b_i and s are zero[6], so that:

$$\frac{\partial h(1 - l_i^*; e_i)}{\partial l_i} = w_i, \quad \forall i = 1, 2 \tag{2}$$

[6]The multipliers have the standard interpretations. For instance λ represents the infinitesimal gains on optimal welfare (utility) of the family when its credit restriction is reduced infinitesimal. In the same way, μ_i represents the infinitesimal gains on the optimal level of utility when the familiy has an additional unit of assets to leave transfers to their child i.

The interpretation of condition (1) is standard: the family benefit of sending child i to work is the current wage earned by this child, and the cost of child labor is the lower future earnings of the child. In households where perfect capital markets allow smooth consumption and there are no issues of "agency" (positive bequests allow parents to internalize the future costs of child labor), parents, even if poor, borrow to finance their children's education, confident in their ability to repay the loan out of the increased earnings of their adult children.

Equation (1) implies that among families for whom the credit and bequest constraints are not binding, only the return to education and wages as a child explain any differences across children. Empirically, it says that variables that do not explain the return to education or wages should not explain education or child labor. In other words, when we consider unconstrained households and apply the model to the gender gap, any observed gap in education and labor supply should disappear after controlling for these two variables.

The second special case considers a household for whom optimal savings is negative and cannot borrow to finance the children's education. In this situation the Kuhn-Tucker multiplier on the savings constraint is positive ($\lambda > 0$). However, the family does not face "agency" problems in the sense that the other constraints are not binding ($\mu_i = 0$). From the first order condition we have:

$$\frac{\partial h(1 - l_i^{cc}; e_i)}{\partial l_i} = w_i \frac{\frac{\partial U_f(c_f)}{\partial c_f}}{\frac{\partial U_p(c_p)}{\partial c_p}} > w_i, \quad \forall i = 1, 2^7 \tag{3}$$

Equation (2) states that parents who are unable to smoothly transfer income from the future into the present by borrowing, will choose an inefficiently high level of child labor since the marginal utility of future consumption is less than that of current consumption and therefore the marginal return to human capital acquisition is greater than current wages in equilibrium. However, since the ratio of marginal utilities of the household is constant within households, the difference between boys and girls within families should not be explained by any factors that do not affect relative wages or relative returns to education.

Now we study the case when parents are not able to leave transfers to their children ("agency" problem). Savings are interior ($\lambda = 0$). In this case $\mu_i > 0$. Parents choose

[7] We denote the levels of variables under credit constraints with "cc".

child labor supply for each child such that

$$\frac{\partial h(1-l_i^{bc};e_i)}{\partial l_i} = w_i \frac{\frac{\partial U_p(c_p)}{\partial c_p}}{\delta_i \frac{\partial V_i(c_i)}{\partial c_i}} > w_i, \quad \forall i = 1,2^8 \tag{4}$$

which from the third first order condition implies that $l_i^{bc} > l_i^*$. Intuitively we can observe that with positive transfers, parents have two instruments to achieve a certain level of welfare for their children: the amount of child labor and transfers. When parents care about their children's welfare and plan to leave positive transfers, they ensure that the child's labor is efficient. Parents can compensate the reduction in the income earned by their children by saving less and reducing transfers (transferring from period 2 into current consumption at period 1). However, for parents whose optimal bequest is negative and thus cannot be reduced, child labor will be inefficiently high and schooling attendance too low, as child labor is the only instrument available to transfer resources from the younger generation to the older generation. Therefore, even when capital markets operate perfectly smoothly (at least within generations) and parents are altruistic towards their children, agency problems can induce too much child labor and too little investment in education. The source of the problem is that poor parents who would require transfers from their future adult children, in the unconstrained optimum, instead use child labor to support the current consumption of the household while allowing themselves to save more for their old age.

Additionally, equation (3) says that there will be more of a distortion in the first order condition if the child is less valued (δ_i is lower) or the child's future consumption is higher. Although we would need conditions on the curvature of the human capital accumulation function to prove a formal theorem regarding the distortion of education levels, this suggests that the education level of the child with the higher wage/lower future wage will be distorted less. Comparing each child to his or her own first best level (unconstrained situation), the lower the δ_i and the marginal utility of consumption in adulthood, the higher the distortion of the constrained optimal level from the first best. As consumption tomorrow is linked to the level of human capital accumulation, the child with the higher wage today would tend to have higher marginal utility of consumption tomorrow and therefore the distortion for this child will be less. As the increase of labor (compared to the first best level) is higher for the non-working child, the gap between siblings is smaller for transfer-constrained-families.

[8] We denote the level of variables under bequest constraints with "bc".

Applying this reasoning to the gender gap, we anticipate that because boys work more, on average, their labor participation rate will be distorted less. Families with the potential to make capital transfers to adult children (for example, transferring animals or the farm to their son), can compensate adult sons for their greater child labor and increase their labor force participation. Therefore, the gender labor force participation gap should be smaller in families in which the non-negative bequest constraint is binding. This is in line with the prediction of Horwitz and Wang (2004).

The conclusion of different intrafamily transfers relates to the work of Botticini and Siow (2003). They analyze the intrafamily transfer incentive in virilocal societies with an application from a premodern economy (early Renaissance Tuscany). In this context, families pay higher dowries for their daughters to increase the chances of her getting married and tranfes consumption to her, and leave bequest to their son, who would stay at home and "have a comparative advantage in working with the family assets relative to their married sister." In our model, although we do not explore the effect of marriage market, it can play a role in defining the way parents choose their time allocation decision of their children, and both human capital accumulation and home skills can be a way to increase the chances for her daughter to find a good marriage. Nevertheless, the effect of wages should permanently affect the choice between schooling and work, rather than home activities.

Summing up, the model presented implies that there should be a gender gap in child labor among unconstrained households only if children's wages and future returns on human capital differ by gender; otherwise children are equal. In the case of capital market imperfection, the labor supply of children is inefficient but the gender gap is determined by the same set of variables as in the unrestricted case.

4 Data

In order to test the main theoretical results, we look at poor families in *Familias en Accion*, a social program implemented in Colombia in 2002. Families in the program were given subsidies, conditional upon school attendance of older children (7 and above) and on nutrition and health check-ups for younger ones. Although the purpose of the survey was mainly to evaluate the subsidy program, it also offers very rich information about the families' characteristics, decision process and expectations, allowing us to obtain insights about child labor decisions and family economics in

general.

We use the base line survey, for which 11,462 households (68,609 individuals) were interviewed. The survey collected information on household living arrangements, economic conditions such as income, assets, transfers to and from the household, detailed family expenditures, external shocks and how the family responded financially to these shocks. Women respondents were asked who makes such decisions as whether the child goes to school if the child does not want to. For individuals 10 and older, there is rich information on education and employment history, type and amount of payments, work arrangements and conditions, time allocation per day, and expected and desired years of schooling.

We focus therefore on the time allocation of children 10 to 17 years old at the time of the first survey. Our sample consists of 16,615 children of whom 47.11% are female[9]. Of these, 6% of boys and 5.5% of girls are only children, and 18% of boys and 15% of girls live with children of the same gender. The remaining sample consists of households with at least one child of each sex.

The survey was designed to evaluate the program *Familias en Accion*. In order to be eligible, families had to be in an eligible municipality. Such municipalities were required to have a population less than 100,000, access to basic education and health services, a bank, and the local authority had to register the municipality in the program. In addition, the municipalities could not be located in the coffee region. Within each town, families registered with SISBEN (System for the Selection of Beneficiaries of Social Programs) were eligible to receive benefits. The survey is based on municipalities registered in the program (a random and stratified selection of 50). These municipalities were matched with a control group based on geographic location, population, and indices of quality of life, and school and health structure availability. Most of the control municipalities were towns with basic school and health infrastructure but without a bank. There were also a few towns chosen to match relatively large municipalities (just over 100,000 inhabitants). Families were chosen at random from eligible families (or potentially eligible in control communities).

Although the survey has households in urban and rural areas, it covers mostly small municipalities -64% of the sample lives in municipalities with less than 14,000 inhabitants. Preliminary analysis reveals that treatment and controls were not well

[9] Age distribution is presented in the Appendix

matched -at least in terms of our variables of interest, i.e. gender differences in time allocation. We therefore ignore the treatment/control distinction and analyze the sample in its entirely. Overall, we have then a sample of poor families in small towns in Colombia, not living in the coffee region.

For working children, we construct a measure of hourly income from work activities (reported wage, independent work income and other kinds of work). For children with no monthly income we have the average hourly wage of his/her gender in the municipality and zero if there is no child worker of his/her gender in the municipality and a dummy indicating that. We are aware that this is not quite a precise measure for those who are not working, since their non-observable wages are probably lower. However, if the latent wages for our non-working boys compared to the ones that work is close to the relative wages for girls (non-working versus working), the measure of the wage gap should be not problematic. Nevertheless, our sample of working boys is much bigger than that of girls. If working children face higher wages, this sample for girls would tend to be drawn from the upper tail of the wage distribution, relative to boys. In that case, we would be underestimating the gender wage difference for children and therefore its effect on the time allocation differentials.

5 Descriptive Analysis

Our main interest is in school attendance and labor force participation. Given that usually a high percentage of girls are involved in domestic duties at home, we also take that activity into consideration in our analysis.

We look at the entire population of children as well as analyzing younger (10-13) and older children (14-17) separately, and divide the sample by urban/rural municipalities. Weighted means are presented in Table 1. The first panel presents the percentage of children involved in each activity while the second one shows the intensity of hours for each activity.

A child is considered working if the day before the interview she spent some time working outside the house or in a family business, or if the information about last year indicates that she was involved in such activities (major task was paid job and/or the child has worked during the last year). Domestic activities at home are constructed as a dummy variable indicating whether a child was involved in household duties for

two hours or more the day before the interview.

The labor force participation rate among children 10 to 17 years of age in our sample is 24%, and 50% of children are involved in either labor activities or domestic duties. As children grow older, the level of labor force participation doubles (from 13% to 36%). Boys labor force participation goes from 19% to 51% while their domestic activities remain at 20%. For girls, participation in the labor market goes from 7% to 19% and domestic activities increase from 36% to 52%. The decrease in school attendance for boys is almost the same as the increase in labor participation rate. For girls, the decrease in education is the same as the increase in both domestic and labor activities. Overall nevertheless, the gap in education favors girls when they grow older. For those age 10 to 13, the gender difference is 3.3 percentage points while for those 14 to 17, it is 12 percentage points.

We would think that education is more compatible with domestic duties than with other work, but changes in activities as children age suggest substitutability between both labor market and domestic duties and schooling, at least for girls. Changes in educational attendance and labor participation as children grow older are larger in rural areas. The urban/rural difference in schooling among 10 to 13 year olds is only 4 percentage points for boys (89% for urban and 85% for rural), and 6 percentage points for girls (94% of urban young girls and 88% in rural areas), but rises to 13 percentage points for older boys (62% urban and 49% rural) and 18 percentage points (76% urban and 58% rural) for girls. For younger girls, there is also not much of an urban/rural difference in labor participation (6% and 7%) and domestic duties (34% for urban girls and 38% in rural areas). In the case of younger boys, the urban/rural gap in terms of work is greater (11 percentage points difference). For older children, there is an urban/rural difference in the labor participation rate of 16 percentage points for boys (42% for urban and 58% for rural), and only 4 percentage point for girls (17% and 21%).

The lower panel of Table 1 presents descriptive statistics for the hours children were involved in each activity the day before the interview. On average, children spent 2.7 hours a day in school activities, less than one hour (0.9) working and about an hour in domestic duties. The general picture in terms of differences across groups (gender, age and urban/rural) is very similar to that based on participation rates. As they grow older, boys spend much more time working (1.5 hours more for the whole sample), and less time studying (1 hour less). The girls also reduce their study time,

by 52 min (0.86 hrs), and increase both their time working and time in domestic duties, but by less than the increase for boys. The increase in the time spent on non-school activities is higher than the decrease in the hours spent in school or doing homework, especially for males. Boys spend 2.15 hours working when they grow older compared to 0.62 for the younger sample. For this group, school time drops from 2.95 hrs to 1.97. And again, rural boys have a much higher change, as the older group works almost 2 hours more than the younger one.

Participation rates and intensity show us that girls go to school more, even when young, and as children grow older, boys go to work and girls go to work or stay at home helping with household chores. Overall, boys are involved in more non-school activities, and that is reflected in the increased gap in education in favor of girls.

Table 2 provides some basic descriptive statistics for boys and girls. Girls work less but among those for whom the major activity is work, "hours worked during the week" is higher than among working boys (41 versus 38), and the average wage is lower. The literacy rate is slightly higher for females (94% versus 92%). The same table also shows the reason given for not going to school by the drop-outs in our sample. The three most important variables, are the ones that show higher gender differences as well. Costs seem to be the main factor (for 65% of girls and 56% of boys). Motivation is the second reason, with big differences between boys and girls; 40% of males said they did not like studying compared with 20% of female drop-outs. Work is the third reason, for 23% of boys and 13% of girls. Household duties are important as well, but there is no gender difference (18% for both groups).

In Table 3 we look at the occupations of working children. The first panel shows the distribution of the main activity among children who have worked at some point in their lives. The percentage of boys and girls for whom the major activity is studying is quite similar (29% for boys and 31% for girls). Boys tend to work more (45% vs 28% of girls) and a higher proportion of girls from this group perform household duties as their main activity (35% vs 8% of boys).

For those whose main activity the week before the interview was work or who did not work but had a job, we have their activities and place of work. The second panel of Table 3 shows that 60% of working boys classified themselves as employees, 20% as self-employed and 20% as family workers with no pay. Girls on the other hand are mostly either employees or maids (around 40% each). The third panel shows the place of work. Most boys are involved in agricultural tasks; for 73% the place of

work is a farm (family or non-family). In rural areas, this percentage goes up to 91%, compared with 38% for urban boys. In urban areas, 20% of boys are employed in an office and 18% work on the streets. Urban girls work mostly at somebody else's house (60%) or in a store or office (19%). A higher proportion of rural girls work on non-family farms (24%) and 45% work as maids.

The last panel of Table 3 shows the reasons for missing school for those who did not attend for at least one day during the last month before the interview, but were still registered in school. Work activities are not an important factor for missing school. The main reason is sickness and there is some gender difference again in motivation: 11% of boys did not want to go versus 7% of girls.

6 Characteristics of Household and Gender Composition

The differences between boys and girls in terms of schooling and labor participation rate, controlling only for age are presented in the first panel of Table 4. This table captures the main aspects of the descriptive statistics presented in detail in the section above. Once we take age into account, girls have a 7 percentage point higher school attendance rate than do boys. In urban areas the difference is 9 percentage points and for rural children 5 percentage points. The main difference is among older urban children, with a raw gap of 14 percentage points in favor of girls. In terms of work participation, there is a difference of 21 percentage points. Older rural children show the biggest gender differences (37 percentage points). In urban areas, the labor gap goes from 9 percentage points among younger children, to 24 percentage points for the 14-17 year old sample. Finally, the last row of Table 4 presents the gap for household duties. Girls perform domestic tasks at home more frequently (23 percentage points). The gap is higher for older children in rural areas (37 percentage points).

We explore the general determinants of child labor typically addressed by the literature, and analyze possible effects on the gender gap. The theory framework tells us that, in principle, the main difference between boys and girls is driven by the wages children face and their return to education.

Although we chose an unitary model to understand the main forces that drive

the time allocation differences of poor children, a growing part of the literature explores the possibility of intrahousehold mechanisms as additional sources of the gap in schooling and work for boys and girls. From this point of view, gender differences on economic conditions, parent's education, family structure and birth order, or bargaining mechanisms within the household, might affect the level of child labor supply and the gap between a boy and a girl. This section not only connects our analysis with the existing literature on the determinants of child education and labor, but also explores additional elements that our model might not capture.

Although the characteristics considered in this section do not enter into the model explicitly, some of them are present. According to our framework, education of parents for instance, since it affects family income, can have a positive effect on children's educational attainment and a negative effect on the labor supply. Parents education can have an effect on the time allocation of their children if a marginal change would bring family income below a minimum threshold for which the time of their children would be allocated efficiently. The theoretical effect on the gender gap is not straight forward. If parents' education is closely correlated to family access to credit, it would have no effect on the gender difference. On the other hand, if having a more educated parent means higher future transfers to their children, more educated parents would have a wider labor gap between their children.

Our first specification analyzes the gender gap for school attendance, labor market participation and domestic work, using a linear regression controlling for a wide set of measures of household and child characteristics.

Different groups of controls are considered in our general estimation: *location of the household* (rural/urban, region dummies, if family is in the subsidy program or not), *house characteristics* (roof, floor and wall materials; whether it has electricity, running water, sewage, garbage system and refrigerator; if family owns or rents, number of rooms), *household structure* (number of families sharing cooking facilities, number of children 0 to 6 years old, and 7 to 17 years old, number of male and female adults, age, education and main activity of head of household and his/her partner), *family roles and interaction* (if mother is involved in participation groups and her leadership role; how the decisions about her children's schooling and about the money she earns are made: by her alone, her partner alone, both together or somebody else), and *family shocks in the last 3 years* (indicating if household faced sickness of a family member, loss of harvest, loss in a family business, fire, floods,

and/or violence). For this specification we do not include pooled income of adults in the household and use mainly household characteristics as a proxy.

As shown in the second panel of Table 4, including this set of controls explains almost none of the gender gap in any of the three activities we are considering; the estimated gap is very close to the raw gap. Most of the controls in this specification are at the family level, and gender of children is mostly random. We have nevertheless some information about the possible determinants of schooling and child labor. Table 4a presents the coefficients for some of the controls included in the specification, dividing the sample into rural and urban areas, and by age group.

There are some variables that affect children's school attandance consistently across age and area of location. All regional dummies are significant. Proxies for family economic status, such as having a refrigerator or the education level of the head of the household, have a positive and significant effect on school attendance for both urban and rural children. For the entire population, the effects of the education of the head of the family and his/her partner (hereafter, wife or mother) are similar, although the effect of the head's education tends to be more statistically significant. Another variable that has a very strong correlation with schooling is the number of children 0 to 6 years of age within the household, with a stronger relation in rural areas. Over the whole sample, on average, having an additional little child at home increases the chance of quitting school by 3 percentage points. The effect for older children and for the rural sample is higher. Having a member in the family sick in the last three years affects children's school attendance negatively. Surprisingly, if the household had a fire in the last three years, children go to school more.

Additionally, if the mother makes the decision when the children do not want to go to school, children tend to go to school more than if it is the father or somebody else makes the decision. This is the case for older children in urban areas and younger ones in rural. This is consistent with the idea that conditional subsidies targeting children should be given through the mother.

Table 4b presents estimates separately for boys and girls in order to determine whether they are affected differently by household's characteristics. Mother's education has a more clearly positive effect on boys than on girls, while with respect to the education of the head of the household, the reverse is true.

Family structure has a different correlation with schooling for boys and girls. With

respect to the number of small children, we divided the variable into two: children 0 to 3 years of age and children 4 to 6 years old. For the whole population, the number of children 0 to 3 years of age in the household has a similar effect for boys and girls. The correlation between schooling and family structure is very similar between boys and girls for the younger group. For children 14 and older, the number of children has a larger effect on girls, and the opposite happens when we look at children 4 to 6 years of age. However, neither of these effects is statistically significantly different between genders. The number of female adults has a positive impact on boys, especially the older group, and none for girls. Finally, if a person in the household is sick, for the whole group the effect is negative and significant for both boys and girls, but the coefficient for older girls is larger (-0.104 versus -0.049 for boys).

There is also a large differential effect of mother's decision making on girls' education. Having the mother or both parents together decide whether the child goes to school if she/he does not want to, increases the school attendance of girls, while it does not have an effect on boys.

We estimated the same specifications for labor participation and domestic duties at home (not shown). For both activities, especially for domestic duties, the coefficients are generally insignificant. The one variable that remains significant for labor force participation is the number of children in the household. As for schooling, the effect of small children (0 to 3) is significant and in the case of labor participation, positive, with no differences in the magnitude of the coefficients across genders. For domestic duties, on the other hand, the number of children does not have any effect on boys but has a mixed effect for girls. The coefficient on the number of children is negative and insignificant at the 0.01 level for 0 to 3 year old children, and positive and significant for 4 to 6 year old children.

This section explores possible determinants of child labor. After controlling for family structure, location of household, house characteristics and family decision process, a significant difference between boys and girls remains. Even more, these covariates do not help us by much in reducing the observed initial differences. In line with theory, we find that characteristics that do not affect wages or future returns to education do not explain the gender gap in time allocation.

7 Gender Differences in Time Allocation and Changes of the Gap

The theory framework states that for poor families both the returns to work (wages) and its marginal cost (foregone human capital accumulation) drive most of the differences in children's activities (equation 1). Empirically, it says that variables that do not explain the returns to education or wages should not explain gender differences. In that sense, our results in the previous section are consistent with the theory. However, this is a weak test. Since the gender of children is quite random, we do not expect that variables such as household structure or father's education, will be strongly correlated with gender. Therefore such variables should not explain any part of such differences. Aditionaly, we do not find different coefficients by gender, which is a stronger result.

We therefore ask whether accounting for wages of the child reduces the gender gap noticeably.

7.1 Role of the Wages

In the absence of constraints on borrowing and transfers, wages would explain a major part of the gender differential on child labor. The other part should be due to differences in the marginal returns to education, although we present some evidence below that leads us to believe that future returns to human capital accumulation are not strongly related to gender.

Families are asked in the first evaluation survey two years after the base line was collected, about their estimate of how much their oldest child could earn with and without a high school diploma. Parents whose oldest child is a boy believe that having a high school degree would give him an average of $154,415$ pesos more per month (around 64 dollars at the time), with a standard deviation of $99,438$. The average difference for girls is almost exactly the same (a difference of $1,100$ pesos, or less than 50 cents). This certainly does not establish that the return to schooling is equal for boys and girls at all levels of education, but to some extent it suggests a limited role for this variable in explaining gender differences in time allocation. While we will not necessarily expect wages to completely eliminate the gender gap for unconstrained households, they should substantially reduce it.

Table 5 presents the results of the estimated gap in schooling and work for a variety of specifications. The information for each activity is divided into two panels. The first one is a dichotomous variable (whether the child is involved in that activity or not) and the second one is a continuous variable (hours spent on each activity the day before the interview). The results are consistent for the two types of variables.

The first row in each panel shows the raw gap controlling only for age. The coefficient is shown separately for younger (10-13) and older (14-17) children and by urban/rural status. We begin by looking at the male/female schooling gap controlling only for wages. The results are shown in the third row of each panel. Comparing the third and first rows, we see that wages account for much of the gender gap in schooling.

The overall gap in school participation falls from 7.0 percentage points to a still statistically significant 2.5 percentage points. The reduction in rural areas is much more notable (from 4.8 percentage points to 0.8 overall) than in urban areas (from 8.7 to 4.8 percentage points). In urban areas, the remaining gap is statistically significant and, at least for older children, large. All differences in school attendance rates are statistically insignificant in rural areas once we control for wages. When we look at hours spent studying the day before the interview, the effect of wages is much stronger. The gender differences become smaller and insignificant across all groups.

The reduction of the estimated gap in terms of work participation is in the same direction as that of schooling. Nevertheless, the percentage point change in the gap is higher by 2 or 3 percentage points across all groups for work participation than for school attendance. However, considering the gap change in percentage terms, the decrease is much higher for education, as the gap in work participation is higher. For the whole population, for instance, the gender gap in schooling is reduced by 64%, while for work participation, it is reduced by 37%.

The largest change when we include wages is for older children in rural areas (from -0.37 to -0.25). For older urban children, the gap goes from -0.24 to -0.16. In rural areas, while the change in education is very strong (83% for the whole sample), the variation in work is around 32%.

Overall, these results fit the model prediction; wages account for much of the gender gap in child labor and schooling.

Our theory framework, additionally, gives predictions for the gender differences

as families face credit constraints. If there are credit constraints but no restrictions on intergenerational transfers, the marginal cost of child labor is equal to the wage, multiplied by the ratio of marginal utility of consumption of the household today and the parents tomorrow (equation 2). As the ratio of marginal utilities is constant within a household, the result with unconstrained families, gender differences should be explained by wages and the return to education, should hold within families.

The second and fourth row of each panel in Table 5 therefore considers family fixed effects. For education participation, the gender gap of the family fixed effect specification with no wage as control (second row of each panel) is lower than the raw gap for most of the groups. For all but rural younger children, the fixed effect gender coefficient is about 80% of the gender differences with no controls. For hours of school activities the day before the interview, the fixed effect gap is smaller for urban children and bigger in rural areas. For work participation, the gap in the fixed effect model is much closer to the raw gap (in terms of percentage). For hours worked, on the other hand, the fixed effect gap is higher, especially in rural areas. Older rural boys for instance, work 2.4 hours more than girls in the samer age group, compared to a 1.9 difference in the raw specification.

These disparities between the family fixed effect model and the raw gap with no controls, show a difference in the gender gap between children of families with same sex children, or an only child, and the gender gap for families with a gender mix. It is unclear at this point if this is because the decision process for the "same-sex" families favors girls or boys or because one group is more disadvantaged than the other, and that is reflected in the time allocation of their children.

Moving to the fixed effect model with wages included, the prediction for the role of this covariate is analogous to that when we exclude fixed effects. Even if families face credit constraints, the ratio of the marginal cost of labor is equal to the ratio of marginal benefits (the wages). For school participation, the estimated gap once we consider family fixed effects and wages is very close to the specification with just wages. For the entire sample, the difference in school participation is 2.9 percentage points, still statistically significant. In urban areas, the gap is smaller than in the third row; the difference for older children drops to 6.8 percentage points, significant at the 5% level. For rural children, on the other hand, the estimated gap is higher than in the third row and, for older children, close to the gap found for urban children. However, there is also no statistical difference in hours of school for any group.

Overall, this section presents strong evidence that children's wages can explain much of the gender gap in education, consistent with the theory. This suggests that other elements such as family structure or within household bargaining are marginal at least in explaining educational attendance differences for our Colombian sample. The explanatory power is not as strong for labor force participation and work intensity differentials. This may be due, in part, to the informality of some of the work the children are engaged in. Children are involved in a variety of short-term jobs. Some of those who performed some sort of work the day before the interview might not be permanent workers and their decision may not be based on wages, but short term opportunities. Similarly, part of the difference may reflect the involvement of children in the family business, particularly farming. Labor activities of this kind might not have as strong an effect on schooling as other, more stable, formal activities.

8 Family Restrictions and Changes in the Gap

The second part of the theory focuses on changes in the gap within families as constraints are imposed. Equations (2) and (3) show how families alter the time allocation of their children when faced with constraints on borrowing or transfers.

Equation (2) in our framework states that families, even under credit constraints, allocate their children's time according to children's wages and returns to schooling. This was partly addressed when we considered the family fixed effect model in section 6. We look further here and compare families in our sample who have debt with those who do not. In this case, rather than looking at credit constraints, which we cannot measure directly, we look at the use of the debt by a family and its consequences for their children.

On the other hand, equation (3) states that for families who do not anticipate making intergenerational transfers to their children, the first order condition is subject to an additional distortion which is larger for the less valued child (if that is the case) or for the child whose future consumption is higher. If there is no parental preference for a specific gender (i.e. the delta coefficient in equation (3) is constant across children within households), we anticipate that the daughter's labor supply will be distorted more since, she would, in the absence of the constraint, work less and study more. Put differently, in the absence of transfers to adult children, parents cannot compensate their boys for the loss of future human capital, from their greater labor

supply and therefore demand more labor from girls than they would otherwise. Even more interesting, gender preferences does not matter for the unconstrained families. Empirically, families more able to make future transfers should have a wider gender gap.

Following this line, we construct a series of variables designed to capture how restricted families are, and interact these with a female dummy in the family fixed effect specification. We are aware that these measures are quite imperfect, but nevertheless we think they can give us insight into the decision process within poor families.

We proxy the ability to make future transfers to adult children by dummies for having large animals (cows, horses, donkeys, pigs or goats) or small animals (chickens, rabbits or ducks). Additionally, we interact the female dummy with a dummy for whether the family has any debts or if it took a loan when the family house was purchased. This is intended to proxy for access to credit markets. According to the theory, there should not be any difference in the gender gap between households with and without credit constraint, so the coefficient on the interaction between gender and the proxy for credit constraint should not be significantly different from zero.

If a rural family has a stock of capital related to their working children's tasks (most boys in rural areas are involved in agricultural activities), they can increase the relative labor time of boys and compensate them in the future with some of that stock. Therefore, the coefficient on this variable interacted with female in the labor supply equation should be negative and significant (i.e. gender gap is higher for unconstrained families), as they will be able compensate boys in the future for working today. We do not claim that the goods a family has today represent a direct measure of the transfers the parents intend to leave to their children tomorrow, but they are certainly positively correlated.

Finally, we include a dummy variable for whether the family owns the house it lives in, and whether the value of the house and the land net of mortgage is positive or negative. We do not have an a priori expectation of the sign of the coefficient on this variable. Families may consider their house as a possible stock to leave to their children, but it may also be a source of collateral, and thus an indicator of credit.

Table 6 shows the coefficient on the interaction terms with the female dummy in the labor supply equation. As elsewhere in this paper, the top panel is the model for the labor participation rate and the lower panel presents the results for hours of

work the day before the interview. Conclusions are fairly consistent if we include each coefficient alone (left panel) or all together in the specification (right panel). Again, as boys work more than girls and are more likely to receive farm stock, families with no animals (more restricted) should have a smaller gender gap than do households with animals. Consequently, the female dummy interacted with the animal dummy should be negative. This is presented in the first two rows of each panel. For both large and small animals, the female interacted coefficient is negative and significant for the entire sample, although the main effect is in the rural areas. This means that families with animals show a greater gender gap in labor than those with no animals, i.e., more restricted families choose the time allocation of their children more homogeneously.

One concern is that as families have more animals, boys would tend to work more on their family farms. Therefore, in our rural sample we exclude those children who consider themselves as family workers and those whose occupation was working on a family farm. Even so, as the main activity is agricultural (90% of rural boys work on a farm), animals are a valuable asset, especially for working children in the future. The effect is mainly in terms of labor participation, rather than intensity. For hours worked, the interaction terms, female and animals, are negative and significant for the whole sample but insignificant when we look at rural and urban areas separately.

The data presented in this section provide evidence in support of the theory related to constraints faced by poor families. Once we control for children's wages, the gender gap is independent of our measures of credit. This indicates that household use debts to smooth family consumption but access to credit does not modify the relative allocation of their children's time. On the other hand, rural families, at least, can use future transfers to their children, to offset inequalities that arise if they exploit their children's comparative advantage. As a result, rural families with animals have a larger gender gap in work than those households with none.

9 Conclusions

Imperfect capital markets and poverty are well known determinants of high levels of child labor in developing countries. Less work has been done on the determinants of differences in child labor within poor households. Using a survey of poor families in Colombia we find that girls have a higher school attendance rate than boys while boys have a higher labor force participation rate than girls.

Our theory model extends Baland and Robinson (2000) to a family with two children. We show that access to credit decreases the level of labor for both children, but gender differences can still be explained, as the case of unconstrained families, by wages for child labor and by the return to schooling. Higher wages for boys encourage them to work.

A child who works today will tend to have a lower income tomorrow (as educational attainment is lower). Parents can make transfers to their adult children to compensate them for this loss. The son, for instance, works as a child and receives some resources from his parent as an adult. In contrast, the daughter attends school. In a sense, the son earns money the daughter would otherwise have to earn to provide current consumption, and receives compensation as an adult. If the parents are poor enough that future compensation is not possible, both children work, and the differences between the boy and girl are smaller. Consistent with this prediction, even among families whose son does not work on the family farm, the within family gender gap is higher among those with animals

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Table 1. Rates of participation (weighted means)									
	All children 10 to 17			All children 10 to 13			All children 14 to 17		
	School	Work	Domestic	School	Work	Domestic	School	Work	Domestic
All	0.76	0.24	0.31	0.89	0.13	0.28	0.60	0.36	0.34
	(0.43)	(0.43)	(0.46)	(0.32)	(0.34)	(0.45)	(0.49)	(0.48)	(0.47)
	15266	15389	15389	8618	8603	8603	6648	6786	6786
All boys	0.73	0.33	0.20	0.87	0.19	0.21	0.55	0.51	0.20
	(0.45)	(0.47)	(0.40)	(0.33)	(0.39)	(0.41)	(0.50)	(0.50)	(0.40)
	8227	8306	8306	4547	4544	4544	3680	3762	3762
All girls	0.80	0.12	0.43	0.91	0.07	0.36	0.67	0.19	0.52
	(0.40)	(0.33)	(0.49)	(0.29)	(0.25)	(0.48)	(0.47)	(0.39)	(0.50)
	7039	7083	7083	4071	4059	4059	2968	3024	3024
All Urban	0.81	0.20	0.28	0.91	0.11	0.25	0.68	0.30	0.31
	(0.39)	(0.40)	(0.45)	(0.28)	(0.31)	(0.43)	(0.47)	(0.46)	(0.46)
	7303	7348	7348	4065	4059	4059	3238	3289	3289
All boys Urban	0.77	0.27	0.18	0.89	0.15	0.17	0.62	0.42	0.18
	(0.42)	(0.44)	(0.38)	(0.31)	(0.36)	(0.38)	(0.49)	(0.49)	(0.39)
	3867	3894	3894	2110	2110	2110	1757	1784	1784
All girls Urban	0.86	0.11	0.39	0.94	0.06	0.34	0.76	0.17	0.46
	(0.35)	(0.32)	(0.49)	(0.25)	(0.24)	(0.47)	(0.43)	(0.38)	(0.50)
	3436	3454	3454	1955	1949	1949	1481	1505	1505
All rural	0.72	0.27	0.33	0.87	0.16	0.31	0.53	0.42	0.37
	(0.45)	(0.45)	(0.47)	(0.34)	(0.36)	(0.46)	(0.50)	(0.49)	(0.48)
	7963	8041	8041	4553	4544	4544	3410	3497	3497
All boys rural	0.69	0.39	0.23	0.85	0.23	0.24	0.49	0.58	0.21
	(0.46)	(0.49)	(0.42)	(0.35)	(0.42)	(0.43)	(0.50)	(0.49)	(0.41)
	4360	4412	4412	2437	2434	2434	1923	1978	1978
All girls rural	0.75	0.13	0.47	0.88	0.07	0.38	0.58	0.21	0.58
	(0.43)	(0.34)	(0.50)	(0.33)	(0.26)	(0.49)	(0.49)	(0.41)	(0.49)
	3603	3629	3629	2116	2110	2110	1487	1519	1519
Intensity: hours of each activity day before interview (weighted means)									
All	2.65	0.89	1.13	3.06	0.42	1.05	2.14	1.47	1.22
	(3.19)	(2.44)	(1.60)	(3.17)	(1.59)	(1.44)	(3.14)	(3.08)	(1.78)
	16615	16615	16615	9165	9165	9165	7450	7450	7450
All boys	2.51	1.31	0.77	2.95	0.62	0.80	1.97	2.15	0.73
	(3.14)	(2.85)	(1.27)	(3.14)	(1.94)	(1.22)	(3.05)	(3.50)	(1.33)
	8788	8788	8788	4830	4830	4830	3958	3958	3958
All girls	2.81	0.41	1.53	3.19	0.18	1.34	2.33	0.70	1.77
	(3.24)	(1.73)	(1.83)	(3.20)	(1.02)	(1.61)	(3.22)	(2.29)	(2.03)
	7827	7827	7827	4335	4335	4335	3492	3492	3492
All Urban	2.73	0.68	1.00	3.05	0.34	0.93	2.35	1.08	1.08
	(3.22)	(2.20)	(1.46)	(3.17)	(1.51)	(1.32)	(3.24)	(2.75)	(1.60)
	8096	8096	8096	4401	4401	4401	3695	3695	3695
All boys Urban	2.55	0.97	0.68	2.90	0.49	0.68	2.13	1.57	0.67
	(3.16)	(2.58)	(1.19)	(3.14)	(1.82)	(1.13)	(3.14)	(3.18)	(1.26)
	4198	4198	4198	2290	2290	2290	1908	1908	1908
All girls Urban	2.92	0.37	1.35	3.23	0.17	1.21	2.58	0.58	1.51
	(3.28)	(1.64)	(1.63)	(3.20)	(1.02)	(1.45)	(3.33)	(2.11)	(1.80)
	3898	3898	3898	2111	2111	2111	1787	1787	1787
All rural	2.56	1.08	1.25	3.05	0.48	1.16	1.94	1.84	1.35
	(3.16)	(2.62)	(1.72)	(3.17)	(1.66)	(1.54)	(3.02)	(3.33)	(1.92)
	8519	8519	8519	4764	4764	4764	3755	3755	3755
All boys rural	2.47	1.61	0.85	2.97	0.74	0.90	1.84	2.68	0.78
	(3.11)	(3.05)	(1.34)	(3.14)	(2.03)	(1.29)	(2.97)	(3.69)	(1.39)
	4590	4590	4590	2540	2540	2540	2050	2050	2050
All girls rural	2.67	0.46	1.72	3.13	0.18	1.46	2.07	0.82	2.05
	(3.20)	(1.82)	(1.99)	(3.21)	(1.02)	(1.74)	(3.09)	(2.46)	(2.22)
	3929	3929	3929	2224	2224	2224	1705	1705	1705

First number is the mean, second is the standard deviation, third is the number of observations

Table 2. Descriptive Statistics

	Boys					Girls				
Variable	Obs	Mean	SD	Min	Max	Obs	Mean	SD	Min	Max
Ever work	8301	0.335	0.472	0	1	7083	0.159	0.366	0	1
age at first work	2710	12.2	2.448	3	17	1110	13.0	2.16	6	17
Hours work/wk	1290	38.79	17.51	0	120	353	41.91	21.04	0	105
Months work last yr	1267	8.107	4.28	0	12	328	6.291	4.616	0	12
Wage/hr	1014	829.9	692.2	8.33	4000	287	621.7	724.8	5	4000
Reads	8239	0.915	0.278	0	1	7046	0.944	0.229	0	1
Writes	8239	0.923	0.266	0	1	7043	0.952	0.214	0	1
Grade now	5956	4.923	2.366	0	19	5618	5.506	2.441	0	17
Didn't go Sch/lastmth	5948	0.259	0.438	0	1	5603	0.225	0.417	0	1
Days didn't go Sch	1503	3.281	3.704	0	30	1301	3.274	5.701	0	99
Reason for no school at all										
High Costs	2186	0.544	0.498	0	1	1354	0.65	0.477	0	1
House duties	2183	0.173	0.378	0	1	1351	0.184	0.387	0	1
Work	2183	0.25	0.433	0	1	1349	0.132	0.338	0	1
No school near	2183	0.065	0.247	0	1	1350	0.093	0.29	0	1
Sch not open	2183	0.016	0.125	0	1	1350	0.013	0.115	0	1
No spots in school	2183	0.011	0.104	0	1	1350	0.012	0.107	0	1
Fail admision	2183	0.008	0.09	0	1	1349	0.00	0.046	0	1
Expelled/fail	2183	0.037	0.189	0	1	1348	0.024	0.153	0	1
did not like study	2185	0.40	0.49	0	1	1349	0.22	0.414	0	1
did not like school	2181	0.05	0.217	0	1	1350	0.046	0.21	0	1
Parents	2182	0.017	0.13	0	1	1351	0.024	0.155	0	1
Sick	2183	0.039	0.193	0	1	1350	0.065	0.246	0	1
Disabled	2183	0.026	0.158	0	1	1351	0.036	0.187	0	1
Other	2179	0.141	0.348	0	1	1354	0.179	0.384	0	1
Preschool ever	7938	0.423	0.494	0	1	6887	0.464	0.499	0	1

Table 3. Occupational Distribution

	All				Urban				Rural			
	Boys		Girls		Boys		Girls		Boys		Girls	
	N	%	N	%	N	%	N	%	N	%	N	%
Major activity, week before the interview for those who have worked (10-17 years old)												
Work	1,222	44.79	310	27.65	399	35.69	119	23.33	823	51.12	191	31.26
Didn't work&have job	35	1.28	10	0.89	7	0.63	2	0.39	28	1.74	8	1.31
Incapacitaded	3	0.11	1	0.09	2	0.18	-	-	1	0.06	1	0.16
Look for job	81	2.97	11	0.98	49	4.38	7	1.37	32	1.99	4	0.65
House duties	214	7.84	391	34.88	92	8.23	148	29.02	122	7.58	243	39.77
Study	803	29.44	342	30.51	383	34.26	199	39.02	420	26.09	143	23.4
Other activity	370	13.56	56	5.00	186	16.64	35	6.86	184	11.43	21	3.44
Total	2,728	100	1,121	100	1,118	100	510	100	1,610	100	611	100
Activity for those whose main activity was working (10-17 years old)												
Employed	736	59.31	128	40.13	273	67.74	49	40.5	463	55.25	79	39.9
Maid	6	0.48	121	37.93	4	0.99	52	42.98	2	0.24	69	34.85
Self employed	245	19.74	33	10.34	91	22.58	14	11.57	154	18.38	19	9.6
Boss/Partner	8	0.64	-	-	-	-	-	-	8	0.95	-	-
Family work no pay	246	19.82	37	11.60	35	8.68	6	4.96	211	25.18	31	15.66
Total	1,241	100.00	319	100.00	403	100.00	121	100	838	100.00	198	100
Place of work for children whose main activity was work (10 and more)												
Store/office of boss	91	7.91	36	12.00	75	20.72	20	18.69	16	2.03	16	8.29
Store/office own	3	0.26	-	-	3	0.83	-	-	-	-	-	-
House-own	13	1.13	29	9.67	4	1.1	6	5.61	9	1.14	23	11.92
House-other	44	3.83	151	50.33	26	7.18	64	59.81	18	2.28	87	45.08
Street-movile	72	6.26	10	3.33	54	14.92	10	9.35	18	2.28	-	-
Street-fixed	16	1.39	1	0.33	12	3.31	1	0.93	4	0.51	-	-
Stand	5	0.43	2	0.67	5	1.38	2	1.87	-	-	-	-
Door to door	4	0.35	1	0.33	1	0.28	-	-	3	0.38	1	0.52
In a vehicle	32	2.78	1	0.33	19	5.25	1	0.93	13	1.65	-	-
Mine	10	0.87	-	-	1	0.28	-	-	9	1.14	-	-
Construction	12	1.04	-	-	11	3.04	-	-	1	0.13	-	-
Farm-own	197	17.13	19	6.33	13	3.59	-	-	184	23.35	19	9.84
Farm-other	651	56.61	50	16.67	138	38.12	3	2.8	513	65.1	47	24.35
Total	1,150	100.00	300	100.00	362	100	107	100	788	100	193	100
Reason missed school last month (for those in school)												
Sick	813	55.76	798	63.18	403	57.49	410	54.16	418	65.31	380	61
Didn't want to go	157	10.77	86	6.81	89	12.7	68	8.98	41	6.41	45	7.22
Work	38	2.61	11	0.87	11	1.57	27	3.57	5	0.78	6	0.96
Work at home	78	5.35	54	4.28	14	2	64	8.45	9	1.41	45	7.22
Transportation	16	1.10	4	0.32	3	0.43	13	1.72	-	-	4	0.64
No money	69	4.73	58	4.59	41	5.85	28	3.7	44	6.88	14	2.25
No class	70	4.80	64	5.07	29	4.14	41	5.42	21	3.28	43	6.9
Other	217	14.88	188	14.89	111	15.83	106	14	102	15.94	86	13.8
Total	1,458	100.00	1,263	100.00	701	100	757	100	640	100	623	100

Table 4. Raw Gender Gap (Female Dummy). Participation rate specification

	All			Urban			Rural		
Age only as control	All	10 to 13	>13	All	10 to 13	>13	All	10 to 13	>13
Education	0.070	0.033	0.117	0.087	0.043	0.137	0.048	0.021	0.085
	(0.006)**	(0.007)**	(0.012)**	(0.009)**	(0.009)**	(0.016)**	(0.009)**	(0.010)*	(0.017)**
Work	-0.206	-0.122	-0.310	-0.158	-0.088	-0.240	-0.244	-0.150	-0.367
	(0.006)**	(0.007)**	(0.011)**	(0.009)**	(0.010)**	(0.015)**	(0.009)**	(0.010)**	(0.015)**
Domestic duties	0.226	0.148	0.323	0.215	0.162	0.277	0.241	0.141	0.371
	(0.007)**	(0.010)**	(0.011)**	(0.010)**	(0.013)**	(0.015)**	(0.010)**	(0.014)**	(0.015)**
All controls									
Education	0.064	0.031	0.103	0.080	0.040	0.126	0.045	0.022	0.074
	(0.006)**	(0.007)**	(0.011)**	(0.008)**	(0.009)**	(0.015)**	(0.009)**	(0.010)*	(0.016)**
Work	-0.201	-0.120	-0.301	-0.148	-0.082	-0.236	-0.245	-0.152	-0.365
	(0.006)**	(0.007)**	(0.011)**	(0.009)**	(0.010)**	(0.015)**	(0.009)**	(0.010)**	(0.015)**
Domestic duties	0.230	0.150	0.330	0.222	0.176	0.277	0.242	0.138	0.379
	(0.007)**	(0.009)**	(0.011)**	(0.010)**	(0.013)**	(0.016)**	(0.010)**	(0.014)**	(0.015)**

Table 4a. School Attendance. Controls Included

	All			Urban			Rural		
	All	10 to 13	>13	All	10 to 13	>13	All	10 to 13	>13
Female	0.064	0.032	0.101	0.08	0.04	0.126	0.045	0.022	0.074
	(0.006)**	(0.007)**	(0.011)**	(0.008)**	(0.009)**	(0.015)**	(0.009)**	(0.010)*	(0.016)**
Age	-0.073	-0.043	-0.097	-0.062	-0.026	-0.102	-0.083	-0.058	-0.09
	(0.002)**	(0.003)**	(0.006)**	(0.002)**	(0.004)**	(0.007)**	(0.003)**	(0.005)**	(0.008)**
Region east	-0.105	-0.043	-0.176	-0.059	-0.006	-0.112	-0.129	-0.063	-0.215
	(0.010)**	(0.011)**	(0.018)**	(0.014)**	-0.015	(0.026)**	(0.016)**	(0.017)**	(0.028)**
Region central	-0.112	-0.055	-0.181	-0.136	-0.069	-0.21	-0.085	-0.046	-0.133
	(0.009)**	(0.010)**	(0.017)**	(0.013)**	(0.013)**	(0.023)**	(0.014)**	(0.015)**	(0.026)**
Region pacific	-0.114	-0.057	-0.185	-0.162	-0.099	-0.223	-0.075	-0.02	-0.154
	(0.012)**	(0.012)**	(0.021)**	(0.018)**	(0.018)**	(0.032)**	(0.016)**	-0.018	(0.029)**
N households	0.014	-0.005	0.044	-0.004	-0.031	0.039	0.047	0.052	0.044
	(0.009)	(0.010)	(0.017)*	(0.010)	(0.010)**	(0.018)*	(0.021)*	(0.022)*	(0.042)
N rooms	0.015	0.006	0.026	0.023	0.005	0.037	0.007	0.007	0.009
	(0.004)**	(0.005)	(0.007)**	(0.006)**	(0.006)	(0.010)**	(0.006)	(0.007)	(0.011)
Fridge	0.041	0.029	0.058	0.034	0.031	0.041	0.046	0.025	0.067
	(0.007)**	(0.008)**	(0.013)**	(0.009)**	(0.010)**	(0.017)*	(0.012)**	(0.013)	(0.021)**
Decision Sch mom	0.051	0.062	0.039	0.046	0.031	0.08	0.056	0.088	0.019
	(0.012)**	(0.013)**	(0.023)	(0.018)**	(0.018)	(0.033)*	(0.017)**	(0.018)**	(0.031)
Decision Sch both	0.036	0.037	0.036	0.028	0.002	0.073	0.041	0.059	0.019
parent	(0.012)**	(0.013)**	(0.023)	(0.018)	(0.018)	(0.034)*	(0.017)*	(0.018)**	(0.031)
Head elementary	0.03	0.029	0.031	0.034	0.023	0.041	0.027	0.032	0.019
	(0.008)**	(0.008)**	(0.013)*	(0.011)**	(0.011)*	(0.019)*	(0.011)*	(0.012)**	(0.019)
Head secondary	0.089	0.057	0.139	0.08	0.046	0.131	0.124	0.073	0.219
	(0.013)**	(0.013)**	(0.023)**	(0.015)**	(0.015)**	(0.028)**	(0.022)**	(0.023)**	(0.044)**
Head college	0.107	0.061	0.233	0.103	0.039	0.257	0.18	0.138	0.289
	(0.043)*	(0.042)	(0.088)**	(0.048)*	(0.046)	(0.098)**	(0.083)*	(0.083)	(0.184)
Partner elementary	0.037	0.025	0.047	0.029	0.016	0.047	0.037	0.028	0.049
	(0.008)**	(0.009)**	(0.015)**	(0.012)*	-0.013	(0.022)*	(0.012)**	(0.013)*	(0.021)*
Partner secondary	0.083	0.061	0.113	0.061	0.051	0.078	0.118	0.077	0.18
	(0.014)**	(0.014)**	(0.027)**	(0.017)**	(0.017)**	(0.032)*	(0.025)**	(0.026)**	(0.051)**
Partner college	0.125	0.059	0.131	0.08	0.071	0.051	0.122	-0.063	0.263
	(0.045)**	(0.060)	(0.068)	(0.047)	(0.061)	(0.073)	(0.119)	(0.147)	(0.188)
N children 0-6	-0.03	-0.02	-0.044	-0.026	-0.019	-0.033	-0.034	-0.021	-0.051
	(0.003)**	(0.003)**	(0.006)**	(0.005)**	(0.004)**	(0.009)**	(0.005)**	(0.005)**	(0.009)**
N adults male	-0.013	-0.002	-0.024	-0.015	-0.012	-0.022	-0.006	0.005	-0.018
	(0.004)**	(0.005)	(0.007)**	(0.006)**	(0.006)	(0.010)*	(0.006)	(0.007)	(0.010)
N adults female	0.019	0.016	0.02	0.019	0.014	0.021	0.017	0.013	0.02
	(0.006)**	(0.007)*	(0.010)*	(0.007)**	(0.008)	(0.012)	(0.009)	(0.010)	(0.015)
Birth order	-0.009	0	-0.042	-0.009	0.003	-0.048	-0.012	-0.004	-0.035
	(0.005)	(0.005)	(0.012)**	(0.007)	(0.007)	(0.016)**	(0.007)	(0.007)	(0.017)*
Partner incapacitaded	-0.163	-0.218	-0.093	0.003	-0.078	0.171	-0.223	-0.281	-0.155
	(0.051)**	(0.055)**	(0.090)	(0.102)	(0.095)	(0.217)	(0.062)**	(0.070)**	(0.106)
shock: sick person	-0.044	-0.026	-0.07	-0.047	-0.033	-0.067	-0.044	-0.022	-0.063
in household	(0.008)**	(0.009)**	(0.015)**	(0.012)**	(0.012)**	(0.022)**	(0.012)**	-0.013	(0.021)**
shock: fire	0.08	0.065	0.102	0.076	0.059	0.073	0.095	0.076	0.123
	(0.015)**	(0.015)**	(0.029)**	(0.023)**	(0.021)**	(0.047)	(0.021)**	(0.022)**	(0.038)**
Observations	15127	8549	6578	7224	4023	3201	7903	4526	3377
R-squared	0.22	0.09	0.17	0.2	0.1	0.2	0.23	0.1	0.16

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Table 4.b. School Attendance by gender.

	Boys			Girls		
	All	10 to 13	>13	All	10 to 13	>13
Age	-0.081	-0.047	-0.103	-0.063	-0.04	-0.089
	(0.002)**	(0.005)**	(0.008)**	(0.002)**	(0.004)**	(0.008)**
Region east	-0.137	-0.074	-0.205	-0.067	-0.002	-0.152
	(0.015)**	(0.016)**	(0.026)**	(0.014)**	(0.015)	(0.027)**
Region central	-0.135	-0.076	-0.207	-0.088	-0.026	-0.153
	(0.013)**	(0.014)**	(0.024)**	(0.013)**	(0.013)	(0.025)**
Region pacific	-0.12	-0.069	-0.185	-0.108	-0.042	-0.182
	(0.017)**	(0.018)**	(0.029)**	(0.016)**	(0.017)*	(0.031)**
N households	0.022	-0.015	0.081	0.003	-0.003	0.015
	(0.015)	(0.016)	(0.027)**	(0.012)	(0.012)	(0.022)
N rooms	0.008	-0.004	0.025	0.026	0.02	0.03
	(0.006)	(0.007)	(0.010)*	(0.006)**	(0.006)**	(0.011)**
Fridge	0.035	0.025	0.048	0.048	0.032	0.069
	(0.011)**	(0.012)*	(0.019)**	(0.010)**	(0.011)**	(0.019)**
Decision Sch mom	0.024	0.057	-0.025	0.085	0.071	0.119
	(0.017)	(0.019)**	(0.031)	(0.017)**	(0.018)**	(0.034)**
Decision Sch both	0.027	0.029	0.026	0.05	0.045	0.06
parent	(0.017)	(0.019)	(0.031)	(0.017)**	(0.017)**	-0.034
Head elementary	0.017	0.004	0.036	0.046	0.058	0.034
	(0.011)	(0.012)	(0.018)	(0.011)**	(0.011)**	-0.02
Head secondary	0.066	0.028	0.139	0.109	0.09	0.146
	(0.018)**	(0.019)	(0.033)**	(0.017)**	(0.018)**	(0.033)**
Head college	0.113	0.001	0.423	0.149	0.146	0.211
	(0.071)	(0.068)	(0.162)**	(0.053)**	(0.053)**	(0.104)*
Partner elementary	0.07	0.057	0.074	-0.006	-0.014	0.01
	(0.012)**	(0.013)**	(0.021)**	(0.012)	(0.012)	(0.023)
Partner secondary	0.122	0.113	0.139	0.034	0.001	0.092
	(0.020)**	(0.021)**	(0.039)**	(0.019)	(0.020)	(0.036)*
Partner college	0.112	0.088	0.078	0.118	0.022	0.15
	(0.068)	(0.093)	(0.103)	(0.058)*	(0.076)	(0.090)
N children 0-3	-0.03	-0.019	-0.038	-0.031	-0.02	-0.051
	(0.007)**	(0.007)**	(0.012)**	(0.006)**	(0.006)**	(0.013)**
N children 4-6	-0.026	-0.012	-0.044	-0.032	-0.03	-0.033
	(0.007)**	(0.008)	(0.013)**	(0.007)**	(0.007)**	(0.014)*
N adults male	-0.011	-0.005	-0.018	-0.017	0	-0.033
	(0.006)	(0.007)	(0.010)	(0.006)**	(0.007)	(0.010)**
N adults female	0.031	0.017	0.041	0.001	0.018	-0.012
	(0.008)**	(0.009)	(0.014)**	(0.008)	(0.009)*	(0.014)
shock: sick person	-0.036	-0.025	-0.049	-0.058	-0.025	-0.104
in household	(0.012)**	(0.013)	(0.021)*	(0.012)**	(0.012)*	(0.023)**
shock: fire	0.081	0.075	0.103	0.076	0.051	0.107
	(0.021)**	(0.022)**	(0.040)*	(0.021)**	(0.021)*	(0.041)**
Observations	8151	4513	3638	6976	4036	2940
R-squared	0.23	0.1	0.17	0.2	0.1	0.18

Standard errors in parentheses

* significant at 5%; ** significant at 1%

Table 5. Gender Gap (Female dummy). Schooling and work

	All	10 to 13	14to17	Urban	Urban10	Urban14	Rural	Rural10	Rural14
School Attendance									
Raw	0.07	0.033	0.117	0.087	0.043	0.137	0.048	0.021	0.085
	(0.006)**	(0.007)**	(0.012)**	(0.009)**	(0.009)**	(0.016)**	(0.009)**	(0.010)*	(0.017)**
Raw FE	0.055	0.034	0.088	0.066	0.035	0.104	0.045	0.031	0.074
	(0.008)**	(0.011)**	(0.018)**	(0.011)**	(0.013)**	(0.026)**	(0.011)**	(0.017)	(0.024)**
OLS	0.025	0.01	0.05	0.048	0.02	0.086	0.008	0.002	0.023
wages	(0.007)**	(0.007)	(0.013)**	(0.009)**	(0.010)*	(0.017)**	(0.010)	(0.011)	(0.018)
FE	0.029	0.014	0.065	0.042	0.013	0.068	0.02	0.011	0.062
wage	(0.009)**	(0.013)	(0.020)**	(0.012)**	(0.016)	(0.031)*	(0.013)	(0.020)	(0.027)*
N	15266	8618	6648	7303	4065	3238	7963	4553	3410
School Attendance. Hours/day									
Raw	0.294	0.241	0.363	0.39	0.332	0.446	0.181	0.146	0.234
	(0.049)**	(0.066)**	(0.072)**	(0.071)**	(0.096)**	(0.105)**	(0.067)**	(0.092)	(0.098)*
Raw FE	0.229	0.235	0.258	0.21	0.218	0.226	0.245	0.244	0.285
	(0.047)**	(0.072)**	(0.097)**	(0.066)**	(0.099)*	-0.146	(0.067)**	(0.103)*	(0.130)*
OLS	0.07	0.035	0.089	0.108	0.037	0.168	0.038	0.01	0.016
wages	(0.053)	(0.073)	(0.078)	(0.078)	(0.107)	(0.114)	(0.072)	(0.101)	(0.106)
FE	0.106	0.124	0.095	0.099	0.129	0.01	0.113	0.137	0.154
wage	(0.055)	(0.086)	(0.114)	(0.078)	(0.123)	(0.177)	(0.076)	(0.122)	(0.148)
N	16615	9165	7450	8096	4401	3695	8519	4764	3755
Work Participation									
Raw	-0.206	-0.122	-0.31	-0.158	-0.088	-0.24	-0.244	-0.15	-0.367
	(0.006)**	(0.007)**	(0.011)**	(0.009)**	(0.010)**	(0.015)**	(0.009)**	(0.010)**	(0.015)**
Raw FE	-0.208	-0.144	-0.315	-0.148	-0.096	-0.211	-0.26	-0.184	-0.404
	(0.008)**	(0.013)**	(0.018)**	(0.012)**	(0.018)**	(0.026)**	(0.012)**	(0.018)**	(0.025)**
OLS	-0.131	-0.074	-0.205	-0.095	-0.046	-0.158	-0.166	-0.098	-0.253
wages	(0.007)**	(0.008)**	(0.011)**	(0.009)**	(0.011)**	(0.016)**	(0.009)**	(0.011)**	(0.016)**
FE	-0.161	-0.114	-0.261	-0.1	-0.042	-0.157	-0.211	-0.167	-0.338
wage	(0.009)**	(0.015)**	(0.020)**	(0.013)**	(0.021)*	(0.031)**	(0.013)**	(0.021)**	(0.027)**
N	15389	8603	6786	7348	4059	3289	8041	4544	3497
Work Participation. Hours/day									
Raw	-0.898	-0.443	-1.458	-0.625	-0.317	-0.982	-1.123	-0.548	-1.871
	(0.036)**	(0.033)**	(0.069)**	(0.047)**	(0.045)**	(0.088)**	(0.054)**	(0.047)**	(0.104)**
Raw FE	-1.047	-0.554	-1.836	-0.677	-0.243	-1.267	-1.389	-0.836	-2.354
	(0.050)**	(0.061)**	(0.119)**	(0.064)**	(0.077)**	(0.157)**	(0.074)**	(0.091)**	(0.177)**
OLS	-0.509	-0.217	-0.889	-0.254	-0.06	-0.486	-0.754	-0.359	-1.307
wages	(0.038)**	(0.036)**	(0.072)**	(0.050)**	(0.048)	(0.091)**	(0.056)**	(0.052)**	(0.110)**
FE	-0.779	-0.402	-1.414	-0.412	0.077	-0.882	-1.1	-0.774	-1.834
wage	(0.056)**	(0.072)**	(0.135)**	(0.074)**	(0.092)	(0.184)**	(0.083)**	(0.108)**	(0.195)**
N	16615	9165	7450	8096	4401	3695	8519	4764	3755

Table 6. Coefficient of female interaction terms with goods and financial restriction variables

	Each interaction terms included in a separate specification			All interaction terms included in one specification		
Family Fixed Effect Specification	All	Urban	Rural no farm	All	Urban	Rural no farm
Wage included	Labor Participation					
Female*big_animal	-0.088	-0.049	-0.061	-0.069	-0.044	-0.046
	(0.015)**	(0.025)	(0.022)**	(0.016)**	(0.026)	(0.023)*
Female*small_animal	-0.082	-0.025	-0.096	-0.055	-0.012	-0.081
	(0.016)**	(0.020)	(0.030)**	(0.018)**	(0.021)	(0.032)*
Female*own_house	-0.012	-0.025	0.011	-0.024	-0.108	0.015
	(0.016)	(0.022)	(0.024)	(0.075)	(0.113)	(0.099)
Female*Positive value house	-0.001	0.002	-0.014	0.001	0.003	-0.009
	(0.016)	(0.022)	(0.023)	(0.016)	(0.022)	(0.023)
Female*debt	0.01	0.021	-0.011	-0.026	-0.088	-0.012
	(0.016)	(0.022)	(0.023)	(0.074)	(0.112)	(0.098)
	Labor Intensity					
Female*big_animal	-0.356	-0.224	-0.112	-0.272	-0.255	-0.05
	(0.092)**	(0.140)	(0.136)	(0.100)**	(0.146)	(0.143)
Female*small_animal	-0.331	0.054	-0.35	-0.215	0.115	-0.346
	(0.097)**	(0.115)	(0.187)	(0.105)*	(0.120)	(0.197)
Female*own_house	-0.066	-0.11	-0.035	-0.17	0.122	-0.902
	(0.100)	(0.124)	(0.149)	(0.451)	(0.597)	(0.641)
Female*Positive value house	0.087	-0.053	0.272	0.088	-0.049	0.266
	(0.098)	(0.124)	(0.146)	(0.098)	(0.125)	(0.146)
Female*debt	0.056	0.119	-0.017	-0.147	0.237	-0.919
	(0.099)	(0.123)	(0.147)	(0.446)	(0.592)	(0.633)

Standard errors in parentheses
* significant at 5%; ** significant at 1%