

Paid and Unpaid Labor in Developing Countries: an inequalities in time use approach

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This paper reports results from work in progress and does not aim to be a draft of an  
article. Comments and suggestions about its parts are very welcome.

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### *Abstract*

The paper summarizes results from work in progress about inequalities in time allocation. We apply tools well known in the field of income inequality analysis in order to assess inequalities in the use of time among urban adults in Brazil and Bolivia. We compare inequalities between groups (age and sex) and within groups and conclude that time allocation differs according to groups, but within group inequalities are also very relevant. We also explore the effects that paid market work, other family member's work, family composition and educational attributes have on the amount of time women spend in unpaid household work, concluding that 1. even when several determinants of time allocation are controlled, women accumulate work activities at a high rate and therefore have to reduce the time available for personal and social activities; 2. children changes radically the sexual division of labors in the household; 3. high education influences time allocation, possibly by means of a class effect.

### *Data and Definitions*

In developing countries the amount of data on time use covering a large share of the total population is limited. Our results are based on two primary sources of data, the Bolivian Mecovi Household Survey 2001 and the Brazilian National Household Survey (PNAD) 2003. Both surveys were designed to be representative of the entire country's population. Time use information in these surveys is limited to two categories, time spent in "domestic activities" and "at work", the former being only unpaid labor and the second consisting of both paid and unpaid labor.

For the purposes of our preliminary study we consider *paid labor* all types of labor that receive direct payment in cash. This excludes activities that involve payments in kind or family business where there is no payment, irrespectively if another family member receives payment for the total family labor. If a person receives both cash and in kind payment, this person's activity is considered paid labor. If a person had two or more paid jobs, we computed the total amount of time spent in paid work by aggregating the time spend in both jobs.

For *unpaid work* we follow the definition available in the surveys and define it as domestic labor as understood by the household members by the time of the survey interview. Therefore, other kinds of unpaid labor (eg. work in family business) were not considered. To keep consistency with the contents of the data we have, we designate paid work by *market labor* and unpaid labor by *household labor*.

The data we have and our definitions of paid (market) and unpaid (household) work have limitations to be applied in situations such as child labor, farm labor and community work, just to name a few. In order to reduce the problems caused by the insufficiencies of our definitions we restricted the population to urban adults aged 20 to 59 years. In some comparisons we make, we take into account only adults that spent time both in paid and unpaid activities and in a few steps of the analysis (final modeling), only adults in any type of marital union.

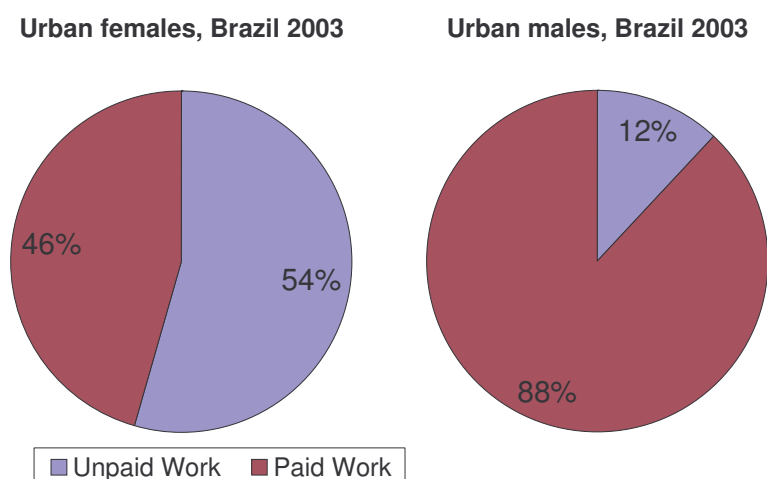
The allocation of time for market and household labor follows different patterns during the week. The notion of a weekend, that is, one or two days in which market labor is not done, usually does not apply to domestic labor. Also, some market activities are not performed every day. In order to ensure some degree of comparison of time spent in either activity we defined a common unit of time, the standardized week day, which is simply the result of the total amount of time spent during the week in a specific activity (market or household labor) divided by seven. A person that works 8 hours a day, five days a week, would work 5.7 hours a day in a standardized week day. In practical terms, this is the same as working with total time spend in a week.

## Main Results

*1. Time allocation differs according to groups*

It is obvious that time is a resource equally distributed in the society. What is not equal is the way time is allocated and the implications of this allocation for the structuring of social relations and its consequences in the well-being of a person. Time allocation is determined by several factors and social roles seem to be one set of relevant determinants of time allocation inequalities. These roles define time allocation in such a way that a clear differentiation between groups can be seen.

Graph 1



Source: Brazilian National Household Survey – PNAD 2003

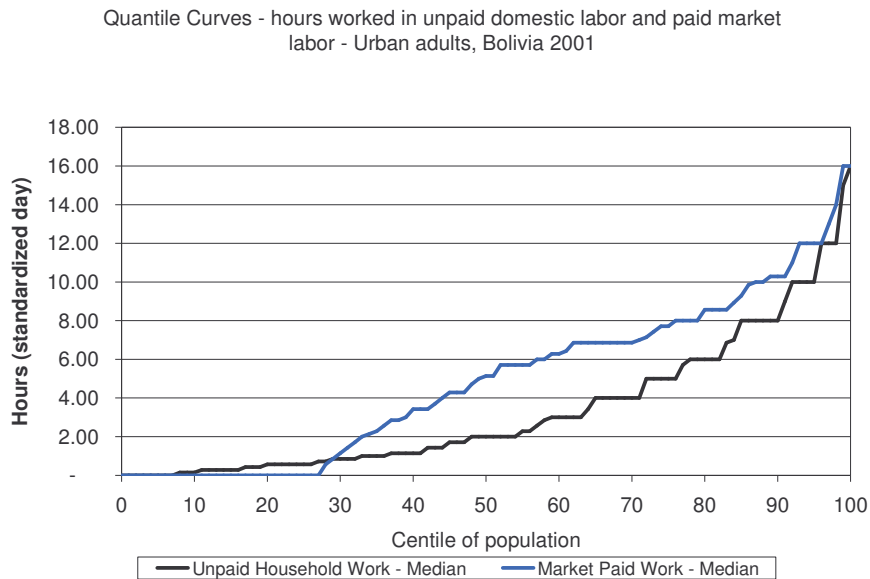
Graph 1 above shows the amount of time allocated in society in both unpaid household work and paid market work, by sex. It is not a graph of total time, but of the sum of time spent in these two activities (types of work). It is clear that allocation is strongly differentiated by sex. Women spend more than half of their work time in unpaid work while men spend just a little more than one tenth of their total work time in that activity. In aggregate terms, in Brazil adult urban females have domestic work as their main activity whereas men have market work occupying most of their work time.

However, this refers to aggregates, that is, to women and men as a group. There is no reason to believe that this allocation is the same for every women and men. Inequalities in the distribution of time spent in each activity deserve further examination at the individual level.

## 2. Distributions of time in Paid and Unpaid Work are different

The distribution of time spent in paid work presents a different pattern when compared to the distribution of unpaid work. Graph 2 below shows the quantile curves for the distributions of time spent in household and market labor in Bolivia.

Graph 2



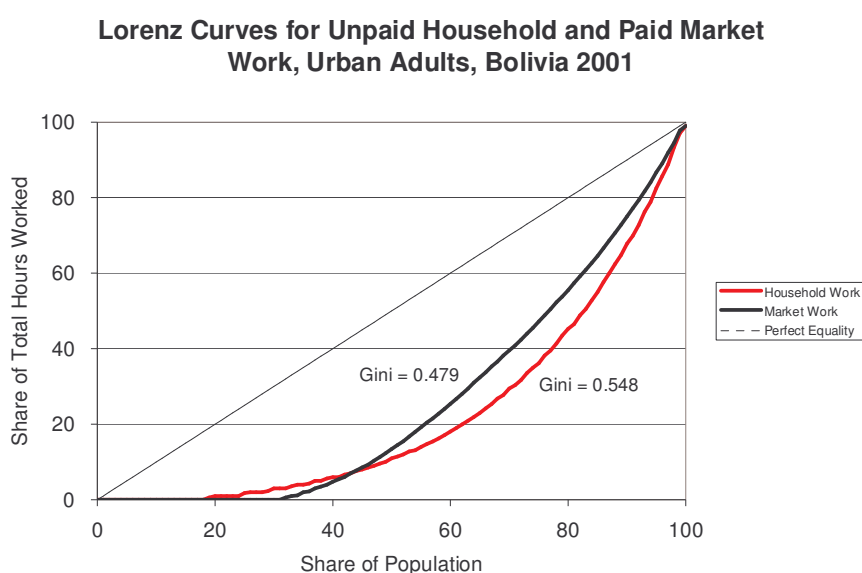
Source: Bolivian Mecovi Survey, 2001

In Graph 2 we see that the disparities in the distributions of time spent in household and market are high and follow different patterns. Almost everybody in the population spends some time working in the household, however the amount of time spent in this activity varies much. The distribution of household work is characterized by a mass of population working quite few hours and a smaller group that spends a large amount of time in household activities. As for the distribution of hours spent in market work, more than one fourth of the population spends no time at all in this activity, but when time is spent in the market, it is usually more than time in household work. Therefore, the disparity in time spent in market work is marked by the difference between those who have a paid labor and those who not, whereas the allocation of no time in household work seldom occurs.

### 3. Inequalities in time spent in household work are lower

Although the quantile curves make easy to observe disparities (absolute inequalities) in time allocation, it is hard to see in the graph above which distribution is more unequal in relative terms. The two Lorenz curves in Graph 3 below present more clearly the inequalities in the distributions of time allocated to household and market work. They show the share of the total time spent in each activity accumulated up to a certain share of the population. For instance, in Graph 3 we see that about half of the population do little more than 10% of the total market work in society and that half of all household work time is concentrated in less than 20% of the population (urban adults).

Graph 3



Source: Bolivian Mecovi Survey, 2001

The more distant from the diagonal of perfect equality the curves are, the more unequal is the distribution of time in the specific activity. The two Lorenz curves cross at 43% of the population, thus the comparison of the curves alone do not allow us to say in which distribution inequality is higher. However, a quick look at the Graph 3 suggests that despite the lack of Lorenz dominance between the curves, the distribution of time spent in household work is much more unequal than the distribution of time spent in market work. Indeed, the Gini coefficient calculated for the household distribution is 0.548 whereas for the distribution of market work it is 0.479, confirming the impression given by the graph.

#### *4. Inequality between and within social groups*

Time is allocated differently by persons. However, those persons compose social groups and we have already seen in the case of the aggregates by gender that there is a clear pattern of allocation that differentiates these groups. Therefore, we may speak of inequality between groups and also of inequality within groups.

Of the overall inequality, how much can be attributed to inequality between groups and how much is due to inequality within groups? In order to look for an answer for this question we must define relevant groups and decompose the total inequality by them. One way to define the groups is to be based on social roles: society constrains and promotes certain activities and behaviors according to these roles so we should expect that groups that share similar roles will allocate their time in similar ways. In terms of both paid and unpaid work, gender and the position in the life course are probably two important dimensions related to the definition of social roles.

Testing the theory that time is allocated according to social roles defined by age and sex is a matter of empirical analysis. By decomposing inequalities between men and women and by age we are able to see the importance that gender and age have to determine how time is allocated.

When we decompose the Theil T index of inequality by sex and age we find that 35% of the total inequality is due to net differences between women and men's allocations of time and only 2% is due to differences between age groups. This means that inequality within groups (that is, within men, women and age groups) is high and that age has less relevance than sex to explain total inequality.

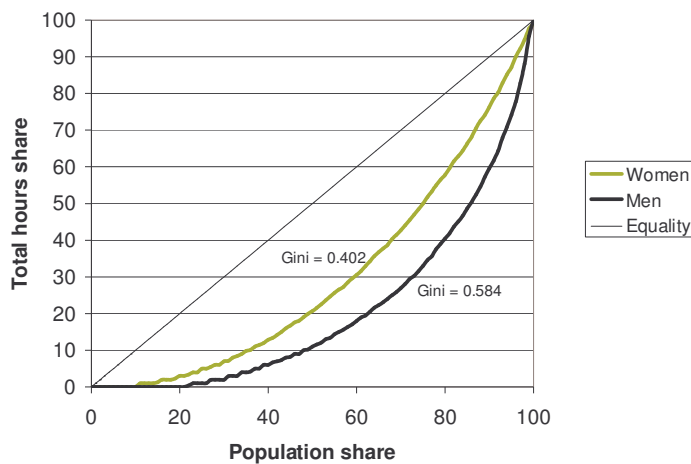
A word must be said about the difference between inequality decomposition and causality. Stating that within sexes inequality responds for 35% of the total inequality does not mean that, in net terms, gender inequalities determine 35% of the total inequality in time allocation between persons. This decomposition does not take into account several variables that may affect time allocation (they will be analyzed below) and could increase or reduce the net effect that gender has as a time use determinant.

Although 35% is a high share of inequality between groups for a binary division of the population, the inequality within groups also deserves some attention. Graph 4 below approaches the inequalities within women and men, separately, by using Lorenz curves. In spite

of the fact that the amount of time spent by women and men in household work is quite different, the Lorenz curves of both groups can be compared as they provide information about relative inequality within each group.

Graph 4

**Within group inequalities: time spend in household work Lorenz curves by sex, urban adults, Bolivia 2001**



Source: Bolivian Mecovi Survey, 2001

Men form a more heterogeneous group when time spent in household work is considered. The inequality in the distribution of time employed in this activity is high in both groups, but much higher among men. For instance, the Gini coefficient for the distribution among men is 0.584 whereas among women it is 0.402. Both are high and the former is higher than many Gini coefficients of country income distributions around the world.

Graph 4 also shows that 21% of the adult urban men of Bolivia do not allocate any time to household activities, a luxury that only 10% of the women can afford. Half of the women spend 20% of all household work time while this share is only 10% for half of the men. Time is allocated so unequally that 10% of the men spend 40% of all male time allocated to household work. Among women this same share of total time is divided by the 20% of the women that work more in this activity.



## 5. Exploring the determinants of time allocation

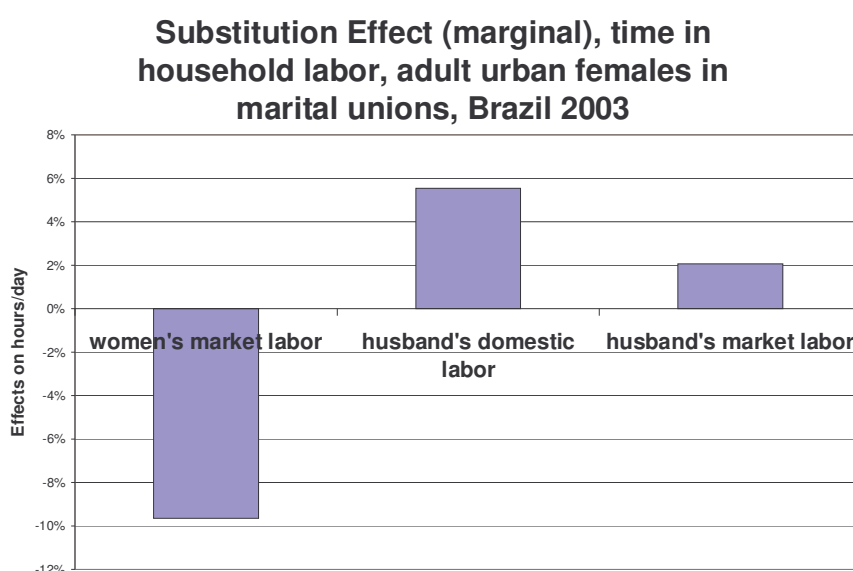
### 5.1. Relation between activities

As time is a scarce resource, each person has – by choice or constrain – to reduce the amount of time allocated in some activity in order to increase the time allocated to another. Work in paid and unpaid activities can substitute each other, but in some cases the time spent on them can be added up and substitute another activities such as rest, personal care, social life, education and so on. The “double journey” is a typical case in which household and market work are accumulated and imply a reduction in other personal and social activities. The exit of the labor market for child caring is a case of substitution.

In this paper we do not explore satisfactorily the relations between activities, but some results obtained so far deserve to be mentioned.

Using regression models applied only to adult urban women living marital unions we were able to isolate the net effect that the increase in the time spent in one activity has in the allocation of time in household work. We also were able to identify the effect that the both household and market work of the male partners (“husbands”) have on female work. The models control for the effect of education, number of children, age and several other factors and will be discussed in detail a separate study.

Graph 5



Source: Brazilian Household Survey, PNAD 2003

It is possible to see in Graph 5 that women's household work time is negatively correlated to their market work time. In the margin, each hour spent in market work reduces in almost 10% the time allocated to household work. A perfect substitution would imply a rate of reduction of 100%. Thus, it becomes clear that women accumulate work activities at a high rate and in average an increase in labor market participation has to be associated to a sharp reduction of time for personal and social activities of women.

The time women allocate to household work is positively correlated to any kind of male work in the household, even after controlling for several other variables. In the case of an increase in male partner's market work time, it seems that women substitute men's household work with their own household work. If this is true, the increase in the earning of males have to be backed up by female household work. Of course, this line of thought requires a more detailed analysis to ensure conclusive results but this analysis is beyond the scope of this study.

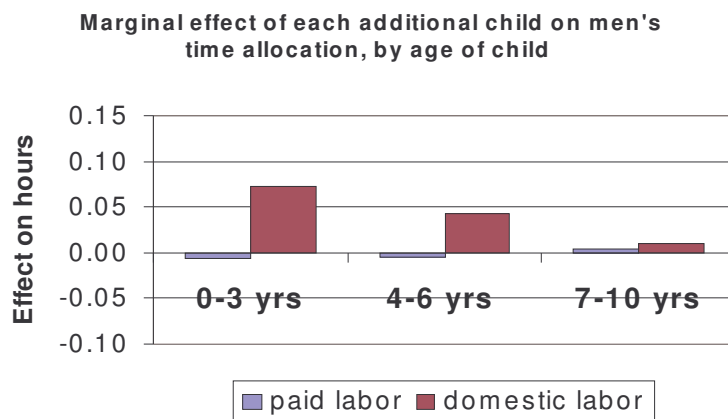
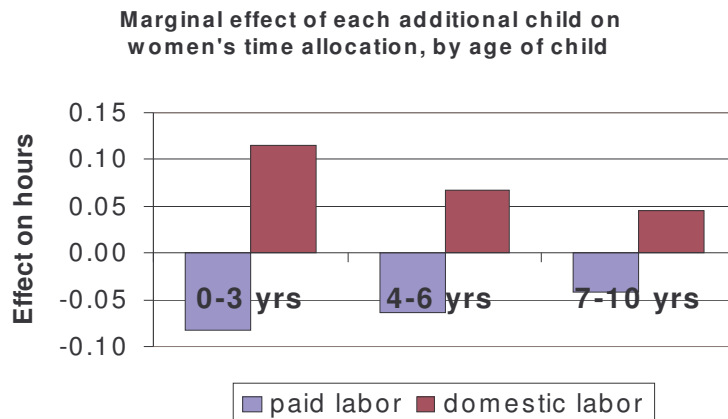
It is not clear to us why an increase in each hour of male household work is related to an increase of 6% of an hour of women's household work. It may be expressing the fact that some families spend more time in household work than others, but it must be noted that this is a net effect obtained after controlling for determinants of the total time a family deploys to household work, such as number of children, regional differences, etc.

### *5.2. Children affect division of labor*

As expected, having children and caring for them causes changes in the division of labor between men and women. Having young children requires more time to be allocated to household work for both men and women, but the burden of the latter is twice heavier. The younger the children, the stronger these effects are.

Considering the female population of all ages, an additional child (starting from zero children) reduces time spent in market work in about 7% and increases in about 12% the household work time if the child is aged 0-3 years. Men also spend more time in household work, about 7% for each additional child of the same age, but there are no relevant reductions in market work time due to children. Children reinforce the allocation of time according to gender roles and any measure that aims to reduce gender inequalities in time use must address the issue of providing care for children.

Graph 6



*5.3. Education reduces household labor*

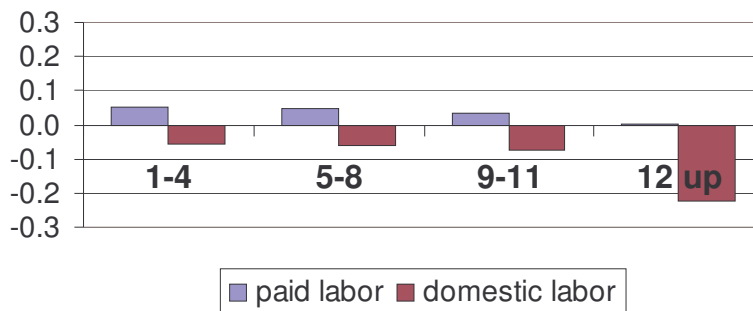
The allocation of time is also differentiated according to the position of the individuals in the social structure. The effect is higher for women than it is for men. As the educational level increases, for instance, we observe a simultaneous increase in female participation in the labor market, but no relevant effect for men; for both men and women, more education is associated with less household work. Our study does not allow us to point the reasons for that effect.

Graph 7

**Education marginal effect  
women's time allocation - Brazil 2003**



**Education marginal effect  
men's time allocation - Brazil 2003**



By the Graph 7 above we may infer that strongly defined gender roles in terms of work time allocation will be more commonly found among the lower social classes. A more equal division of labor in the households is more likely to be found among the better educated population. We still need further analysis to discuss the causes and implications of these effects.