



**Master Course in  
“Applied Labour Economics for Development”  
(MALED)  
2010/2011  
Turin, Italy**

**DISSERTATION**

**Gender differences in time allocation: Evidence  
from Rwanda**

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*Abstract*

This paper seeks to shed light on gender differences in time allocation to market and domestic activities in Rwanda. Using data of the integrated household survey conducted in 2005, evidence shows that compared to men, women spend more hours on domestic activities while the reverse, though not proportional, is true when we consider market work. Men tend to specialize on market work, while women accumulate both domestic activities and market work, therefore experiencing a double-burden.

**Key words:** Rwanda, Gender, time allocation, domestic activities, market work.

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## 1. Introduction

Gender disparities in terms of opportunities, security, and participation to the labour market have become important issues for developing economies and for Africa in particular, not least because of their potential negative effects on both sustainable growth and poverty reduction. Women's education, employment, and earnings are essential in the fight against poverty, not only because of the direct and interrelated contribution they make to household welfare, but also because of the personal power they provide women in shaping and making family decisions and in redirecting household spending on essential needs, especially in favor of children's health and education (UNICEF 1999). This is the reason gender equality is now among the aims of most Poverty Reduction Strategy Papers and is also one of the United Nations Millennium Development Goals (Saba et al 2010)

Rwanda is a developing country whose population is in majority female. According to the 2002 population census, females make up 52 percent of the total population (NISR 2009). The labour force is predominantly in agriculture and the vast majority of economically active adults in Rwanda are subsistence farmers working on family farms: 71 percent of the working population is classified as subsistence farmers in their main job among whom women occupy an important share. The Demographic and Health Survey conducted in 2009 showed that 86 percent of women were working in agriculture compared with 62 percent of men.

There continues to be a gap in education between women and men. The proportion with no formal education is higher among women (22 percent) than men (15 percent) and the proportion of those who have attained secondary or higher education is higher among men (16 percent) than women (12 percent). These differentials are also seen in urban- rural residence: 24 percent of women in rural areas have no education, compared to 17 percent of men. In urban areas, 13 percent of women have no education, compared to 9 percent of men. (NISR 2009)

In addition, the move away from unpaid family subsistence farming is much more marked for males than for females and greater proportions of males have moved away from farming than is the case for females.

Moreover, 31 percent of households are headed by women, and according to the Demographic and Health survey (2009), fertility rate for Rwandan women remains high: the total fertility rate (TFR) is 5.5 children per woman, 4.7 in urban area and 5.7 in rural area.

So far, no study yet has assessed how Rwandan men and women allocate time in order to reconcile their role in the household with their participation in productive activities.

Most of the studies on time allocation, have concentrated on developed countries; there are few researchers who tried to tackle this subject in developing countries, and to a lesser extent in sub-Saharan Africa. The unavailability of data is the main impediment which limits research on time allocation in developing countries, as in most of these countries, time use surveys have not yet been conducted, and the available data are often incomplete, unreliable and in most cases, not up to date.

The present study seeks to:

1. Investigate the determinants of time spent on market work and domestic activities across gender;
2. Analyze gender differences in time spent on domestic activities and market work;
3. Determine the effect of the presence of infants and children<sup>1</sup> in the household, on time spent on domestic activities and on market work, for men and women.

This thesis is structured as follows: section two presents the review of the literature; section three describes data and methods used; section four reports and discusses the results, and finally comes the conclusion.

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<sup>1</sup> 0-5 years for infants; 6-14 years for children.

## **2. Literature review**

In this section, we briefly review the results of several recent researches on gender differences in time allocation. We categorize the results into two groups namely developed and developing countries.

### **2.1 Evidence from Developing World**

In Sub-Saharan Africa, both men and women engage in a number of productive and reproductive work activities. Time use studies from the region reveal that women spend more time than men at work particularly when their inputs in non-SNA<sup>2</sup> production, namely domestic and care work, are included. Children and adolescents, particularly girls, also have important economic roles in their household. In Tanzania, girls at every age have heavier work burdens than boys (Mason and Khandker in Ritchie et al 2004). In Uganda, girls work 21.6 hours per week while boys 18.8 hours a week (Uganda DHS in Ritchie et al 2004). A cross-country study which includes two countries from the region, South Africa and Kenya also shows that girls spend more time on non-SNA work in the form of domestic activities compared to boys (Ritchie et al 2004).

Agriculture is the main source of livelihood in Sub-Saharan Africa. It accounts for 35 percent of the region's GDP and 70 percent of its employment (World Bank 2000). Women provide about 50 to 75 percent of all agricultural labor in the region (Saito 1994). A study conducted by the International Food Policy Research Institute (IFPRI) indicates that African women undertake about 80 percent of the work in food storage and transportation, 90 percent of the work of hoeing and weeding, and 60 percent of the work in harvesting and marketing (Quisumbing et al. 1995, in Blackden and Canagarajah 2003).

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<sup>2</sup> The System of National accounts (SNA) includes under production boundary all production actually destined for the market, whether for sale or barter, and all goods and services provided free to households or to the community by the government (GOV) or the Non-profit institutions serving households (NPIS-HH). Any other production outside this boundary is considered as non-SNA.

Reproductive tasks, such as housework, cooking, care for children, sick, and elderly household members, are necessary to maintain families. The time required for these activities is usually positively correlated with the poverty level of households (Barnett and Whiteside 2002). Poor households in rural areas depend on female household members for the provision of reproductive tasks since they lack the economic means to access market substitutes. Additionally, whenever the household is confronted by a crisis, such as illness, the time spent on care-giving and domestic work increases significantly. Women and girls bear a large portion of these unpaid reproductive responsibilities which are often made more time consuming due to the lack of adequate household technologies. Cooking and childcare are among the most time-consuming of women's reproductive responsibilities (World Bank 2006). In the same paper on Sub Saharan Africa, the researcher went further and found also a significant impact of HIV/AIDS on domestic burden carried mostly by women by taking care of HIV patients in their households.

Quentin et al (2010) in their study conducted in Sierra Leone found ample evidence that women allocate substantial time to domestic chores, and that this burden limits their economic opportunities. In turn, because the time spent on domestic chores is not easily dispensable, and because domestic chores are performed mainly by women, many women have limited opportunity to engage in productive activities. This may limit their income and decision power within the household. Scarcity of time also means that women have limited opportunities to further their education and training. Many empirical results obtained in this study confirm conventional wisdom: women are found to work more than men on domestic tasks and the domestic workload of children is also high. At the same time, it is also found that those who already work in the labor market also spend quite some time on domestic work. Thus, the hypothesis of a clean division of labor between those who work in the labor market and those who work at home is not necessarily warranted.

However Quentin's analysis was only descriptive, which makes impossible any generalization on the whole population under study.

According to the research conducted in Ethiopia by Suárez (2010), on average women work much more than men. Interestingly, gender inequality in total work time observed in Ethiopia, as in many developing countries, contrasts with the iso-work phenomenon observed in developed

countries. The average total work time per week rises to 52 hours for women, while it is only about 36 hours for men. Accordingly, women spend almost one third of their time working, which is 10 percent higher than men.

According to the same author, the incidence of market work is higher among men (82 percent) than among women (67 percent). In contrast, almost all women do housework, while half of men are not involved in any of the household activities. Moreover, the average duration of housework is 39 hours for women and 13.6 for men; nearly three times higher for women while the average duration of market work is 36 for men and 24 for women; that is more than 10 hours longer for men.

The author concluded that there is a strong gender-based division of labor in Ethiopia, which is much more acute in rural areas. Women work more and for longer hours than men in the household, while the reverse is true in the labor market.

Xinyu (2007) based on observations on Shenzhen residents in China, found clear individuals' role in the household: men are dominant in out-of-home activities, but women dominate in-home activities. On average, women carry more maintenance responsibilities than men, but men spend more time on work and leisure activities than women, especially on the weekend. He pointed out that most people spend their time at home and around their neighborhoods, especially the female. Further, the influences of household structure on time allocation of both household heads demonstrated substantial gender-role differences.

Marcelo et al (2007) in their research in Bolivia found evidence that what characterizes gender differences is not only who does one particular type of work, but mainly how much work that person does. By a partial trade-off we mean there is no complete substitution between paid and unpaid work. Women have entered the labor market and men have increasingly assumed responsibilities for domestic work. But for women this has resulted mostly in an increased workload. On average, women work more than men, due basically to a double shift of work, that is, an accumulation of both paid and unpaid work responsibilities.

Amin and Suran (2008) in their study on Terms of Marriage and Time-Use Patterns of Young Wives conducted in rural Bangladesh found that the average woman spends 29 percent of the

day doing domestic chores, and nearly all women reported some domestic activity. They also found that the amount of domestic work increases with number of children.

## **2.2 Evidence from Developed World**

In developed countries, many studies on gender differences in time use have been conducted, and the results have some similarities with what have been obtained in developing world. The common denominator is mainly the fact that women spend much more time on caring and domestic work compared to men who tend to specialize on market work.

Tania (2009) analyzed gender inequality in work-life balance and found that in Italy, the amount of time dedicated to domestic work is the most evident element of gender inequality in the use of daily time. Women's employment rate is influenced by domestic and care work and it generally depends on partners' sharing of care responsibilities.

The increasing participation of women in paid work has modified the gender division of domestic tasks; nonetheless, women still carry the heaviest load in terms of working hours spent on care work

Mancini and Pasqua (2010) in their research conducted on time use between Italian parents found that women's time allocation is generally more responsive to family and individual characteristics than men's time allocation. This seems to indicate that women are still considered as secondary earners in the household. Women's time allocation, in fact, depends strongly on the presence, the age and the number of children.

The same authors also found that the presence of children in the household, instead, did not affect fathers' working decisions in 1988, becoming important only in 2002, when fathers were more involved in children caring and education as a response to women's increased participation in the labour market.

Breen and Cooke (2004) used a game theory model on 22 countries to analyze gender division of domestic labour. The authors found that the proportion of marriages in which men contribute to domestic work may increase as the proportion of economically *autonomous*<sup>3</sup> women increases,

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<sup>3</sup> Economically independent women.

but this effect is contingent on the share of male *adjusters*<sup>4</sup> in the population. Thus, to realize an aggregate change in the division of domestic labour, both a greater proportion of women within a society must be autonomous so that they can credibly threaten divorce in the face of a non-cooperating man, and a greater proportion of men must have a sufficiently non-traditional gender ideology to prefer domestic participation over divorce.

Frances Mc. and Russell (2008) found that the distribution of paid and unpaid work in Ireland is very different for men and women. On weekdays, men spend on average considerably more time on paid employment than women, while women spend substantially more time on caring and domestic activities. These gender patterns also hold for the weekend. Men continue to spend more time in paid employment, while women spend much more time on caring and domestic work. While women's and men's employment time declines at weekends, women's unpaid work and caring time remains virtually unchanged; this leads to a gender gap in time devoted to leisure at weekends. There are further differences in the type of unpaid work that women and men carry out. In the case of childcare, men are more likely to be involved in social/emotional care while women do the bulk of the physical care/supervision. In terms of housework, women spend a far greater amount of time on core domestic tasks like cleaning, cooking and shopping, while men spend more time on house repairs and gardening.

The same authors concluded that women's allocation of time to caring and housework is altered by their involvement in paid work. Paid work is not added to an undiminished unpaid workload; rather, time in employment leads to reduced allocation to unpaid work, although this is far less than a one-for-one reduction. These differences are accentuated by the presence of children, since having young children in Ireland leads to a much greater increase in women's unpaid workload than men's regardless of their paid work hours.

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<sup>4</sup>Men who, if faced with an economically autonomous woman, would rather participate in domestic tasks than endure marital breakdown. Breen and Coke (2004).

### **3. Methods and data**

#### **3.1 Descriptive analysis**

Our analysis starts with a descriptive one, where we present the proportion of men and women in each type of activity, and the mean hours spent on domestic activities as well as on market work by gender breakdown.

#### **3.2 Data and definition of variables**

This research uses data from the Household Integrated Survey, a nationally representative survey carried out in 2006. The sampling frame for the survey was stratified by the 12 old provinces<sup>5</sup>, as well as by urban and rural areas. At the national level three residential strata were defined: City of Kigali which is the capital, other urban, and rural. A stratified two-stage sample design was selected for the survey. The primary sampling units (PSUs) were the enumeration areas defined for the 2002 census. A sample of 6900 households was selected at second sampling stage. As Rwanda is predominantly rural, only 1620 households were selected from urban areas and 5280 belong to rural areas. The units of analysis are the individual members of the households aged 15 years and above.

The choice of this survey's data is motivated by the fact that it is the most recent which contains useful information for the present research, notably demographic information on individuals and the households they belong to, data on labour market participation, hours spent on jobs as well as time spent on different types of domestic activities broken down by fetching wood, fetching water, going to the market, cooking, childcare and cleaning.

We have two independent variables namely "hours spent on market work" per week and the "hours spent of domestic activities" per week resulting from the aggregation of hours spent on gathering wood, fetching water, cooking, going to the market, cleaning, laundering and childcare. For each of the two variables, we estimate its incidence and duration across men and women, and we estimate two equations to analyze the determinants of each type of work.

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<sup>5</sup> Following the administrative reform of March 2006, Rwanda has now only 4 provinces (North, South, East and West) plus the capital city Kigali; each province is divided into districts and the whole country counts 30 districts currently.

The following independent variables are included and they account for individual characteristics and household characteristics: Sex of the individual (a dummy for female), marital status (a dummy for married), education (six dummies: no education, primary incomplete, primary complete, secondary incomplete, secondary, university)<sup>6</sup>, area of residence (a dummy for rural area), sex of the head of the household (a dummy for male head), household size, household poverty status<sup>7</sup> (a dummy for poor), the poverty gap of the household (poverty depth)<sup>8</sup>, number of infants (0-5 years) in the household, number of children (6-14 years) in the household.

The above mentioned variables are grouped into two categories, namely individual and household characteristics and are summarized in Table 1:

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<sup>6</sup> n-1 dummies are included in the model; "no formal education" category is considered as a reference.

<sup>7</sup> Indicates if the household is poor or non-poor. This variable is provided in the dataset, the poverty line was set at 90,000 Rwandan Francs (approximately 160 USD) per adult per year by the National Institute of Statistics of Rwanda.

<sup>8</sup> Poverty depth measures the gap between the poverty line and per equivalent adult income/expenditure of the household; it varies from 0 to 1. It takes 0 for non-poor household. This measure is important as households are not equally poor. This variable is provided in the dataset.

**Table 1***Summary statistics of the variables*

<b>Individual characteristics (Sample: 18,931 individuals aged 15 and above)</b>		<b>Household characteristics<sup>9</sup> ( sample: 6900 households)</b>	
<b>Sex</b>		<b>Area of residence</b>	
Male (Reference)	45.9%	Rural	76.5%
Female	54.1%	Urban (Reference)	23.5%
<b>Marital status</b>		<b>Household size</b>	5 ( mean)
Married	47.7%	<b>sex of the household head</b>	
Non married (Reference)	52.3%	Male	71.8%
<b>Education</b>		Female ( Reference)	28.2%
No formal education (Reference)	23.38%	<b>Poverty incidence</b>	
Primary incomplete	41.63%	Poor	51.1%
Primary complete	18.42%	Non poor( Reference)	48.9%
Secondary incomplete	12.14%	<b>Poverty depth</b> 0.39 (mean)	
Secondary complete	2.73%	<b>Number of infants (0-5 years)</b>	
University	1.69%	0	41.1%
		1	28.6%
		2	23.2%
		3	6.6%
		4	0.4%
		5	1.1%
		<b>Number of children (6-14 years)</b>	
		0	36.3%
		1	28.0%
		2	20.7%
		3	10.7%
		4	3.5%
		5	0.7%
		6 and more	0.1%

Source: Author's creation based on 2005/2006 Rwanda household integrated survey.

However, we foresee some limitations with these data. Preferably, time-use surveys are the most suitable for time allocation analysis, as they are based on daily diaries filled by the respondents

<sup>9</sup> As the unit of analysis is the individual, each individual is attributed the characteristics of the household he/she belongs to.

that indicate with high precision the activities done. Unfortunately, time use survey has not yet been conducted in many developing countries and Rwanda is not an exception.

This limitation notwithstanding, we try to use these data with some caveats in our eventual conclusions.

### 3.3 The model

It is inevitable that a non negligible number of men and women did not participate in at least one of the two types of activities, i.e market work and/or domestic activities; consequently, our dependant variables have many zero values. Thus, our data are censored at zero, and we need to apply a censored regression model “The Tobit Model”, a non linear model estimated using maximum likelihood estimation techniques.

#### 3.3.1 Tobit model

The Tobit model expresses the observed level of  $y$  in terms of an underlying latent variable:  $y^*$

$$y_i^* = \beta_0 + \beta_1 x_i + \varepsilon_i$$

$$y_i = \begin{cases} \beta_0 + \beta_1 x_i + \varepsilon_i & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases}$$

This model is nonlinear and thus, it is estimated using maximum likelihood estimation techniques. The likelihood function for the Tobit model takes the form:

$$\log L = \sum_{y_i > 0} -\frac{1}{2} \left[ \log(2\pi) + \log \sigma^2 + \frac{(Y_i - \beta X_i)^2}{\sigma^2} \right] + \sum_{y_i = 0} \log \left[ 1 - F\left(\frac{\beta X_i}{\sigma}\right) \right]$$

#### 3.3.2 Interpreting Tobit Estimates

Interpreting estimated coefficients from the Tobit model is a bit more complex than interpreting estimated coefficients from the Ordinary Least Squares (OLS) model. In particular, the estimated coefficients represent the marginal effect of  $x$  on  $y$ .

$$\frac{\partial E[y_i^* | x]}{\partial x_i} = \beta$$

That is, the estimated coefficients from the Tobit model represent:

And thus correspond to the marginal effect of  $x$  on the latent variable  $y^*$  not to the observed variable  $y$ . Sometimes  $y^*$  is what is of interest but usually it is not. What we really want is the marginal effect of  $x$  on  $y$ .

Thus, what we want is the expected value of  $y$  conditional on  $y$  being greater than zero. Given by:

$$E[y_i | y_i > 0] = \beta_0 + \beta_1 x_i + \sigma \left[ \frac{\phi((\beta_0 + \beta_1 x_i) / \sigma)}{\Phi(\beta_0 + \beta_1 x_i) / \sigma} \right]$$

The desired marginal effects are then the derivative of this function with respect to  $x$ . We use STATA 10.1 to estimate marginal effects of each independent variable on time spent on market work and on domestic activities as well.

#### 4. Estimation and interpretation of results

##### 4.1 Sharing domestic activities and Market work between men and women in Rwanda

Table2 presents the proportion of men and women participating in each type of activity, and the average hours spent by an individual on each type of activity per week by sex.

The results confirm that a high proportion of women (89%) perform household chores while only 54% of men participate in those activities. In addition, women spend on average 23.5 hours per week on domestic activities while men spend only 5 hours per week. However, when we consider market work the difference is not very important: 71% of men are involved while the proportion for women is 73%, but when it comes to the number of hours, women spend less compared to men, that is 21 and 26 for women and men respectively.

The bottom line of these results is that the proportion of women is higher in both activities, but women spend much of their time on household chores and slightly less on market work, and as

these domestic activities are not paid, a big proportion of women continue to depend on their husbands who are considered as breadwinner, therefore limiting the bargaining power of women in their households.

**Table 2**

*Incidence and duration of domestic activities and market work per week by sex*

	Men	Women	Total
<b>Domestic activities</b>			
<i>Incidence (%)</i>	54.0	89.3	73.7
<i>Duration (mean hours)</i>	5.2	23.5	15.0
<i>Incidence x Duration</i>	2.8	21	11.1
<b>Market work</b>			
<i>Incidence (%)</i>	71.0	73.4	72.3
<i>Duration (mean hours)</i>	26.1	21.4	23.6
<i>Incidence x Duration</i>	18.6	15.7	17

**Source:** Author's estimation based on 2005/2006 Rwanda household integrated survey.  
**Note:** Individual aged 15 years and above. Results weighted.

Table 3 displays results on time spent on domestic activities and market work by sex and place of residence. It highlights that 90% of women in rural areas are involved in household activities compared to 56% of their male counterparts. The participation is higher in rural areas for both sexes with respect to those living in urban areas.

As far as market work is concerned, the proportion of participation is higher for women in rural areas (76%). As noted for domestic activities, the participation in market work is also higher in rural areas for both sexes with respect to those living in urban areas. One tentative explanation can be the fact that the main activity in rural areas is agriculture where almost everyone participate and as the habitation in Rwanda is still scattered, most of the population live surrounded by their pieces of land therefore facilitating them to perform both domestic and farming activities, especially for women. However, men and women in rural areas spend less time on market work compared to their counterpart in urban areas. This is due to the fact that agricultural activities that are predominant in rural areas are mostly performed before noon and depend on seasons, the reason why underemployment is higher in rural areas.

**Table 3**

*Incidence and duration of domestic activities and market work per week by sex and place of residence*

	Urban		Rural	
	Men	Women	Men	Women
<b>Domestic activities</b>				
<i>Incidence (%)</i>	43.4	84.7	56.4	90.4
<i>Duration (mean hours)</i>	5.4	24.4	5.1	23.3
<i>Incidence x Duration</i>	2.3	20.6	2.9	21.
<b>Market work</b>				
<i>Incidence (%)</i>	67.3	60.4	71.9	76.3
<i>Duration (mean hours)</i>	34.9	26.9	24.1	20.2
<i>Incidence x Duration</i>	23.5	16.2	17.3	15.4

**Source:** Author's estimation based on 2005/2006 Rwanda household integrated survey.

**Note:** Individual aged 15 years and above. Results weighted.

Having seen the results in the two tables above, there is enough evidence to conclude that in Rwanda there is a gender-based division of labor; women spend on domestic activities four times (18 hours more) the hours spent by men. While the same women spend less on market work compared to men. However, the difference in market work is smaller (5 hours less) implying that women are double burdened, therefore signaling the possibility that women in Rwanda may experience time poverty which can be assessed in further research.

Table 4 presents time allocated to domestic activities and market work across gender by the number of children in the household. The gap is also shown, which is given by the hours spent by men minus the hours spent by women. The common trend is the fact that while the time spent on domestic activities increases for women as the number of children increases; it's the other way around for men; as the number of children increases in the household men devote less time on domestic activities.

However, as far as market work is concerned, its relationship with the number of children seems fuzzy and will be clearly assessed in the model.

**Table 4**

*Hours spent on domestic activities and on market work by sex and the number of children in the household.*

Number of children 0-14 years	Mean hours spent on domestic activities per week			Mean hours spent on market work per week		
	Men	Women	Gap	Men	Women	Gap
0	7.2	19.8	-12.6	26.3	18.2	8.1
1	5.3	21.6	-16.3	24.1	20.5	3.6
2	5.3	22.8	-17.5	25.3	21	4.3
3	4.7	24.3	-19.6	26.2	22.4	3.8
4	4.7	25.5	-20.8	26	22.7	3.3
5	4.8	24.7	-19.9	29.6	21.5	8.1
6	4.8	25.6	-20.8	27.8	21.7	6.1
7 and more	1.9	26.3	-24.4	24.8	22.5	2.3

**Source:** Author's estimation based on 2005/2006 Rwanda household integrated survey.

**Note:** Individual aged 15 years and above. Results weighted.

Table 5 presents time allocated to domestic activities and market work with respect to the level of education. Results indicate that women spend more hours on domestic duties compared to men at all levels of education; the gap gradually increases up to primary school level and start to shrink from secondary level onwards. For market work, the gap seems to be small within each category of education; however, men spend more hours except for university level where women spent one hour more per week compared to their male counterparts.

**Table 5**

*Hours spent on domestic activities and on market work by sex and education*

Level of education	Mean hours spent on domestic activities per week			Mean hours spent on market work per week		
	Men	Women	Gap	Men	Women	Gap
No formal education	4.4	22	-17.6	25.8	21.8	4
Primary incomplete	6.5	25.4	-18.9	26.4	22.18	4.2
Primary complete	4.7	26.5	-21.8	30.7	30	0.7
Secondary incomplete	3	16.7	-13.7	18	13.6	4.4
Secondary complete	2.3	13.8	-11.5	29	26.8	2.2
University	1.4	10	-8.6	29	30	-1

**Source:** Author's estimation based on 2005/2006 Rwanda household integrated survey.

**Note:** Individual aged 15 years and above. Results weighted.

## 4.2 Determinants of time spent on domestic activities

Our analysis starts with a model for all, i.e. both men and women, and it's followed by two models specific for each sex.

Table 6 presents marginal effects of individual and household characteristics on time spent on domestic activities. The results suggest that being a Rwandan woman increases the time devoted to domestic activities by 25 hours per week with respect to Rwandan men.

The same results suggest that when a woman gets married, her housework load increases by almost 4 hours a week, while for men, being married reduces the time spent on household chores by 11 hours a week.

Those who completed secondary school spend 8 hours less domestic activities compared to those without education. However, at a university level, this reduction becomes higher for women (15 hours) compared to men with the same level of education (13 hours). This seems obvious as the opportunity cost of performing domestic activities while having a university level is higher.

When we consider the area of residence, women in rural areas spend fewer hours on household chores with respect to their urban counterparts, the difference is 4 hours. However, for men being in rural or urban area has no effect on time they spend on domestic activities.

Considering poverty status of the household, both men and women in poor households spend less hours on domestic activities compared to their counterparts living in non poor households; related to this, there is ample evidence that the more poverty of the household becomes deeper, the less men and women perform domestic activities. This result is not surprising as poor families have limited domestic activities; especially those in rural areas with limited land therefore limiting their agricultural and livestock related activities which occupy the bulk of domestic activities.

In addition, childcare burden seems to be supported more by women than by men. One additional infant (0-3 years) in the household increases the time spent on domestic activities by 5

hours per week for women and by 2 hours only for men. When we consider the number of children (6-14 years), an additional child increases by 2 hours the time spent by women on household chores while the effect on time spent by men is not significant. It is clear that young children increase more the hours spent on domestic work as they need much care while when they grow up they start taking care of themselves and helping in various domestic activities like fetching water, cooking, etc...

When we consider the size of the household, this has a negative effect on time spent on domestic activities by both men and women. An additional member in the household decreases time allocated to domestic chores by 1 hour for men and almost 3 hours for women per week

Furthermore, being in a household with a male head increases the time devoted to domestic activities by 4 hours for men and by almost 5 hours for women compared to those living in female headed households.

**Table 6**

*Marginal effects of individual and household characteristics on hours spent on domestic activities per week by sex*

VARIABLES	(1) All	(2) Male	(3) Female
<b>Individual characteristics</b>			
female	25.1239*** (71.07)		
married	-3.3969*** (-7.37)	-10.8151*** (-16.58)	3.6968*** (5.70)
Primary incomplete <sup>10</sup>	3.8066*** (8.62)	1.9990*** (3.27)	4.4804*** (7.97)
Primary complete	1.8579*** (3.59)	-0.2021 (-0.32)	3.5817*** (5.12)
Secondary incomplete	-6.9673*** (-9.67)	-7.5832*** (-8.30)	-5.9475*** (-6.21)
Secondary complete	-8.4043*** (-7.39)	-8.5586*** (-6.00)	-7.9604*** (-5.29)
university	-14.9428*** (-8.38)	-13.2561*** (-6.61)	-15.0127*** (-6.26)

<sup>10</sup> No formal education is the reference category.

<b>Household characteristics</b>			
Household size	-2.1913*** (-18.99)	-1.2934*** (-8.43)	-2.8743*** (-19.25)
rural	-1.7725*** (-3.61)	0.8520 (1.47)	-3.9081*** (-5.78)
Male household head	6.2139*** (12.93)	4.1104*** (7.13)	4.9852*** (7.60)
Poor household	-2.2213*** (-4.57)	-1.4782** (-2.40)	-2.0065*** (-3.05)
Poverty depth	-3.5846*** (-4.02)	-3.8866*** (-3.29)	-3.3075*** (-2.76)
Infant(0-5)	3.5514*** (16.50)	1.9066*** (6.72)	5.0947*** (17.53)
Children(6-14)	1.3099*** (6.48)	0.2347 (0.85)	2.3311*** (8.88)
Constant	5.6220*** (7.04)	9.2000*** (8.99)	30.4770*** (30.57)

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Results weighted; Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Individual aged 15 years and above.

### 4.3 Determinants of time spent on market work

Table 7 presents marginal effects of different covariates on time spent on market work. Gender is an important determinant of time spent in the labor market. Our results suggest that being a woman decreases the time spent on market work by 5 hours compared to men.

Being married increases for men and women the time weekly devoted to work respectively by 12 and 7 hours.

Concerning low levels of education, as far as women are concerned, there is no difference between those who did not go to school and those who studied up to primary level while for men there is a difference of 4 hours. The hours spent on market work start to decrease almost proportionally for both sexes from secondary level onwards.

Surprisingly, both men and women with university level spend 11 hours less on market work compared to those without any formal education. This can be explained by the fact that those without education are engaged in less productive activities and earn less, especially in farming activities, and need therefore to work more hours.

The area of residence is also an important determinant where, men and women in rural areas work less hours compared to their urban counterpart: respectively 13 and 8 hours less.

Members of poor households spend less on market work compared to non poor for both sexes; this is the same when we look at poverty depth, where the more the household is poor, less its members work in the labour market, and this is valid for both men and women; this may be a signal of an existing link between poverty and visible underemployment which can be assessed in future studies.

The size of the household has also significant negative effect on time devoted to market work; an additional member in the household reduces time devoted to market work by other household members.

Considering the sex of the household head, this has no effect on men; however, women residing in male headed household work 5 hours less in the labour market compared to their counterpart in female headed households. This result is what was expected by the researcher, as most female heads are widows who need to work harder as they are the sole breadwinners. Furthermore, Rwanda is a country where men are still considered as breadwinner, though it's increasingly improving, and some married men consider their spouses as housekeeper therefore limiting their participation in the labour market.

Attempting to analyze the effect of children, we found that one additional infant (0-3 years) increases market hours of household member by 3 hours for men, and 2 hours for women; implying that both men and women work more. This contradicts the belief that the presence of infants limit the hours women spend on market work; on contrary women tend to accumulate both market work and childcare. This result is inherent to the long lasting culture in Rwanda of having many children, where children are considered not as charges but rather as helpers who can take care of the household while other members are working, especially those involved in agriculture.

The presence of an additional child (6-14 years) in the household affects time spent on market work only for women; that is one hour more while it's not significant for men. Based on these

results, it's clear that men specialize on market work while women are double-burdened, therefore performing both market and domestic activities.

**Table 7**

*Marginal effects of individual and household characteristics on hours spent on market work per week by sex*

<b>VARIABLES</b>	(1) <b>All</b>	(2) <b>Male</b>	(3) <b>Female</b>
<b>Individual characteristics</b>			
female	-4.7928*** (-9.21)		
married	9.5068*** (13.52)	12.4463*** (11.08)	7.3387*** (8.33)
Primary incomplete	0.8968 (1.46)	2.5127** (2.18)	0.6981 (1.02)
Primary complete	1.7583** (2.42)	4.0879*** (3.25)	0.4227 (0.49)
Secondary incomplete	-19.3631*** (-17.21)	-19.8810*** (-10.79)	-17.8120*** (-12.90)
Secondary complete	-1.9968 (-1.06)	-3.8369 (-1.40)	0.6780 (0.26)
university	-10.2502*** (-3.72)	-11.1361*** (-2.95)	-10.7514*** (-2.82)
<b>Household characteristics</b>			
Household size	-0.6989*** (-3.82)	-0.6649** (-2.20)	-0.5684*** (-2.60)
rural	-9.7549*** (-12.33)	-12.5373*** (-10.26)	-7.6228*** (-7.51)
Male household head	-3.7362*** (-4.68)	0.8744 (0.61)	-5.1461*** (-5.32)
Poor household	-4.0426*** (-5.53)	-7.7044*** (-6.22)	-1.2736 (-1.49)
Poverty depth	-4.3218*** (-3.13)	-6.0284** (-2.47)	-3.1045** (-2.00)
Infants (0-5)	2.2282*** (7.17)	2.6203*** (5.18)	1.7256*** (4.54)
Children(6-14)	0.8932*** (2.93)	0.3562 (0.69)	1.0825*** (2.99)
Constant	33.0392*** (26.62)	30.3156*** (13.55)	26.8774*** (19.17)

Results weighted;

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Individuals aged 15 years and above.

## 5. Conclusions

This study addressed the issue of gender differences with respect to time allocated to market and domestic activities

We analyzed data from the household integrated survey conducted in Rwanda in 2005; the methodological approach was composed of two parts, first a descriptive analysis assessing the incidence and duration of both market and domestic activities for both sexes. Second, a Tobit model was applied to estimate the effect of each determinant on both types of work for both men and women.

Overall, we found that in Rwanda, there are significant gender differences in time allocation. Women spend more hours on domestic activities compared to men while the reverse is observed in the labour market. However, though women spend fewer hours in the labor market, the difference is very small compared to a big gap between men and women when domestic activities are concerned, which implies that women are double burdened and tend to accumulate both types of work while men concentrate on market work.

It is noteworthy to mention that, *inter alia*, education has a significant effect on time allocated to both market and domestic activities by both men and women, where the number of hours spent on either work reduces as an individual advances in education, especially for men and women who manage to reach a university level.

Indeed, the presence of children in the household was found to be an important determinant that increases the time devoted to domestic activities by women, and the time allocated to market work by both sexes, therefore signaling gender asymmetry *vis-à-vis* the time devoted to childcare in Rwanda.

Finally, considering limitations of our data, we would like to recommend further studies to incorporate, *inter alia*, access to basic infrastructure such as water, electricity and childcare facilities and data on wages and earnings which may be potential determinants of time allocated to household chores and market work respectively. Furthermore, there is a need to conduct time use survey in Rwanda to allow a meticulous and complete analysis.

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