



Working Paper

N°8

Gender differences in time allocation: evidence from Rwanda

Olivier Habimana



International Training Centre of the International Labour Organization

Viale Maestre del Lavoro, 10

10127, Turin, Italy

www.itcilo.org

The Working Paper of the Turin School of Development is part of a wider effort by the International Training Centre of the ILO to contribute to the development policy dialogue through a wide dissemination of research findings of its staff, postgraduate course participants, partner institutions and external collaborators. Papers are selected for publication on the basis of originality, technical soundness and policy relevance.

This paper was originally written by Olivier Habimana under the supervision of Silvia Pasqua in partial fulfilment of the requirement of the Master in Applied Labour Economics for Development offered by the Turin School of Development of the International Training Centre of the ILO in partnership with the University of Turin and the Institut d'Etudes Politiques de Paris (Sciences Po). More information on the Master's Programme is available at <http://maled.itcilo.org/>.

Copyright © International Training Centre of the ILO, University of Turin and Institut d'Etudes Politiques de Paris (Sciences Po), 2017.

The aim of this publication is to stimulate development policy dialogue. Materials in this publication may be freely quoted or reprinted with proper acknowledgement and reference to the document.

Publication in the Working Paper of the Turin School of Development does not preclude the authors from subsequently publishing the papers in peer-reviewed journals, books and other venues.

Suggested citation for this paper

Habimana, O. 2017. Gender differences in time allocation: Evidence from Rwanda. Turin School of Development Working Paper No. 8. International Training Centre of the ILO, Turin, Italy.

Disclaimer

The designations employed in this publication and the presentation of materials do not imply the expression of any opinion whatsoever on the part of the International Training Centre of the ILO or its partner institutions concerning the legal status of any country, area or territory or of its authorities, or concerning the delimitation of its frontiers.

The responsibility for opinions expressed rests solely with their authors, and publication does not constitute an endorsement by the International Training Centre of the ILO or its partner institutions of the opinions expressed in them.

Reference to names of firms and commercial products and processes does not imply their endorsement by the International Training Centre of the ILO or its partner institutions, and any failure to mention a particular firm, commercial product or process is not a sign of disapproval.

GENDER DIFFERENCES IN TIME ALLOCATION: EVIDENCE FROM RWANDA

Olivier Habimana

Corresponding author: E-mail: stat.oliver@gmail.com

Abstract

This paper seeks to shed light on gender differences in time allocation for market-related and domestic activities in Rwanda. Using data from the Integrated Household Survey conducted in 2006, the evidence shows that, compared to men, women spend more hours on domestic activities, while the reverse – although not in the same proportion – is true for market-related work. Men tend to specialize in market-related work, while women accumulate both domestic and market-related duties, thereby shouldering a double burden.

Key words: Rwanda, gender, time allocation, domestic activities, market-related work.

Contents

1. Introduction	1
2. A review of the literature.....	3
2.1 Evidence from the developing world.....	3
2.2 Evidence from the developed world.....	5
3. Methods and data.....	8
3.1 Data and definition of variables	8
3.2 The model.....	11
3.2.1 Tobit model.....	11
3.2.2 Interpreting Tobit estimates	12
4. Estimation and interpretation of results	13
4.1 Sharing of domestic activities and market-related work between men and women in Rwanda	13
4.2 Determinants of time spent on domestic activities.....	17
4.3 Determinants of time spent on market-related work.....	18
5. Conclusions	20
References	21
Annex A: Determinants of time spent on domestic and market related activities	23

1. Introduction

Gender disparities in terms of opportunities, security, and participation in the labour market have become important issues for developing economies and for Africa in particular, not least because of the potential negative effects of such disparities on both sustainable growth and poverty reduction. Women's education, employment, and earnings are essential elements 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 afford women in shaping and making family decisions and in redirecting household spending to essential needs, particularly in favour of children's health and education (UNICEF, 1999). This is the reason why gender equality is now included in the targets 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 in which women are in the majority. According to the 2002 population census, women make up 52 per cent of the total population (NISR, 2009). The labour force is predominantly employed in agriculture and the vast majority of economically active adults are subsistence farmers working on family farms. In fact, 71 per cent of the working population are classified as subsistence farmers as their main job and, within this category, women have a major share. The Demographic and Health Survey conducted in 2009 showed that 86 per cent of women were working in agriculture compared to 62 per cent of men.

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

In this context, more men than women have decided to move away from unpaid family subsistence farming and low paid agricultural work.

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

So far, no study has assessed how Rwandan men and women allocate time so as to reconcile their roles 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 have tried to tackle this subject in developing countries, and even less so in sub-Saharan Africa. The unavailability of data is the main impediment limiting 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 is 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-related work and domestic activities by gender;
2. Analyse gender differences in time spent on domestic activities and market-related work;
3. Determine the effect of the presence of infants and children¹ in the household on time spent on domestic activities and on market-related work by men and women.

This work is structured as follows: section 2 presents a review of the literature; section 3 describes the data and methods used; section 4 presents and discusses the results. A concluding section completes the report.

¹ 0-5 years for infants; 6-14 years for children

2. A review of the literature

In this section the main findings of several recent researches on gender differences in time allocation will be reviewed. The results are separated into two groups, one for developed and one for developing countries.

2.1 Evidence from the 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, especially when their inputs in non-SNA² production, namely domestic and care work, are included. Moreover, children and adolescents – particularly girls – have important economic roles in their households. In Tanzania, girls at every age have heavier workloads than boys (Mason and Khandker in Ritchie et al., 2004). In Uganda, girls work 21.6 hours per week, boys 18.8 hours (Uganda DHS in Ritchie et al., 2004). A cross-country study which includes two countries from the region, South Africa and Kenya, shows that girls spend more time than boys on non-SNA work in the form of domestic activities (Ritchie et al., 2004).

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

Reproductive tasks such as housework; cooking; and caring for children, the sick and elderly are necessary for maintaining families. The time required for these activities is usually positively correlated with the poverty level of the household (Barnett and Whiteside, 2002). Poor households in rural areas depend on female members for the provision of reproductive tasks since they lack the economic means to access market-related substitutes. Additionally, whenever a household member has to face a negative event such as illness, the time spent on care-giving and domestic work increases significantly. Women and girls carry a large portion of these unpaid reproductive responsibilities, which are often made more time-consuming by a lack of adequate technologies. Cooking and child care are among the most time-consuming of women's

² The System of National Account (SNA) includes under the production boundary all production actually destined for the market, whether for sale or barter, and all goods and services provided for 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 responsibilities (World Bank, 2006). In addition, HIV/AIDS has a significant impact: the burden of caring for any HIV patients in households is mostly carried by women.

In their study conducted on Sierra Leone, Quentin et al. (2010) found ample evidence that women allocate substantial time to domestic chores, and that this burden limits their economic opportunities. In turn, since the time spent on domestic chores is not easily dispensable, many women have fewer opportunities to engage in productive activities. This may limit their income and decision-making power within the household. Scarcity of time also means that women may find it more difficult to further improve their education and training. Many empirical results obtained in this study confirm the conventional wisdom: women are found to work more than men on domestic tasks, especially in the care of children. At the same time, it has been found that most women who already work in the labour market work at home as well. Thus, the hypothesis of a clean division of labour between those who work in the labour market and those who work at home is not necessarily warranted. However, Quentin et al. (2010)'s analysis is only descriptive and does not allow any generalization concerning the whole population being studied.

According to the research conducted in Ethiopia by Suárez (2010), on average, women work much more than men. Interestingly, the gender inequality in total work time observed in Ethiopia, as in many developing countries, contrasts with the iso-work phenomenon observed in developed countries.³ The average total work time per week reaches 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 per cent higher than for men: the share of hours spent working expressed as a share of total time available is 46 per cent for women and 32 per cent for men. According to the same author, the incidence of market-related work is higher among men (82 per cent) than among women (67 per cent). In contrast, almost all women do housework, while half of men are not involved in any household activities. Moreover, the average duration of housework is 39 hours per week for women and 13.6 for men – that is nearly three times as high for women – while the average duration of market-related work is 36 hours per week for men and 24 for women, a difference of 12 hours. The author concludes that there is a strong gender-based division of labour 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 labour market.

Xinyu (2007), using observations on Shenzhen residents in China, found a clear

³ Total work is defined as the sum of work for pay and household work (child and elder care, shopping, meal preparation, clean up and household care). In developed countries, adult men spend more time working for pay, while adult women spend more time doing non-market work. These differences are generally offsetting. Iso-work refers to a statistically insignificant gender difference in total work (Burda et al., 2012)

division of roles in the household: men are dominant in out-of-home activities while women dominate in the case of 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 at the weekend. He pointed out that most people spend their time at home and around their neighbourhoods, especially females. Further, the influence of household structure on the time allocation of household heads demonstrated substantial gender-linked differences.

In their research on Bolivia, Marcelo et al. (2007) found evidence that gender differences are characterized not only by who does one particular type of work, but even more so by how much work that person does. They use the term “partial trade-off” to indicate that there is no complete substitution between paid and unpaid work. Women have entered the labour 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, owing basically to a double shift of work. This 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 per cent of the day doing domestic chores, and nearly all women reported to be engaged in some domestic activity. They also found that the amount of domestic work increases according to the number of children in the household.

2.2 Evidence from the developed world

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

Tania (2009) analysed gender inequality in work-life balance and found that in Italy the amount of time dedicated to domestic work is the most obvious element of gender inequality in the daily use of time. Women’s employment rate is influenced by domestic and care work and it generally depends on partners’ sharing 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 on time allocation 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 regarded as secondary earners in the household. Women's time allocation depends strongly on the presence, age and number of children. The same authors also found that the presence of children in the household did not affect fathers' working decisions in 1988, but that this had changed by 2002 when fathers had become more involved in child care 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 analyse 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 independent women increases, but this effect is contingent on the share of male adjusters in the population.⁴ Thus, for an aggregate change in the division of domestic labour to occur two factors are required. First, a greater proportion of women within a society must be autonomous so that they can credibly threaten divorce when faced with a man who does not cooperate. Second, a greater proportion of men should have a sufficiently non-traditional gender ideology to prefer domestic participation over divorce.

McGinnity 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 considerably more time on paid employment than women, while women spend substantially more time on care and domestic activities. These gender patterns also hold for the weekend. While women's and men's employment time declines at weekends, women's unpaid work and caring time remains virtually unchanged, this leading to a gender gap in time devoted to leisure at weekends. There are further differences in the types of unpaid work that women and men carry out. In the case of child care, men are more likely to be involved in social and emotional care while women do the bulk of the physical care and supervision. In terms of housework, women spend a far greater amount of time on core domestic tasks such as cleaning, cooking and shopping, while men spend more time on house repairs and gardening. They concluded that women's allocation of time to caring and housework is affected by their involvement in paid work. Paid work is not added to an undiminished unpaid workload. Time in employment leads to a reduced allocation of unpaid work, but 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 working hours.

⁴ Women's individual levels of relative economic autonomy are not in themselves sufficient to bring about an aggregate shift in the domestic division of labour. They show that what is required is a greater proportion of economically autonomous women together with a sufficiently large proportion of men who, if faced with an economically autonomous woman, would rather participate in domestic tasks than endure marital breakdown.

This section aimed to analyse previous research into time allocation by gender. The next sections will be dedicated to the description of the empirical strategy employed in this study.

3. Methods and data

This section is dedicated to the description of the sample under analysis and the econometric approach followed in the empirical strategy.

After the description of the Household Integrated Survey 2006 and the variables under study, this section sets out the descriptive analysis of the proportion of men and women and the corresponding mean hours spent in each type of activity. Then, the econometric model used for the estimations will be presented.

3.1 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 according to the 12 old provinces,⁵ as well as by urban and rural areas. At 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 6,900 households was selected at a second sampling stage. As Rwanda is predominantly rural, only 1,620 households were selected from urban areas and 5,280 from rural areas. The units of analysis are the individual members of the households aged 15 years and over.

The choice of this survey's data is motivated by the fact that it is the most recent, containing 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, and time spent on different types of domestic activity broken down as follows: fetching wood, fetching water, going to the market, cooking, child care, and cleaning.

Two independent variables are used, namely "hours spent on market-related work" per week and "hours spent on domestic activities" per week, resulting from the aggregation of hours spent variously on gathering wood, fetching water, cooking, going to the market, cleaning, laundering and child care. For each of the two variables, incidence and duration for men and women are estimated, and two equations are used to analyse the determinants of each type of work.

⁵ Following the administrative reform of March 2006, Rwanda now has only four provinces (North, South, East and West) plus the capital city Kigali. Each province is divided into districts and the whole country currently has 30 districts.

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

⁶ n-1 dummies are included in the model. No formal education category is considered as a reference.

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

⁸ Poverty depth measures the gap between the poverty line and the equivalent adult income/expenditure of the household. It varies from 0 to 1. It takes 0 for a 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

Individual characteristics (Sample: 18,931 individuals aged 15 and over)		Household characteristics ⁹ (Sample: 6,900 households)	
Sex		Area of residence	
Male (Reference)	45.9%	Rural	76.5%
Female	54.1%	Urban (Reference)	23.5%
Marital status		Household size	5 (mean)
Married	47.7%	Sex of the household head	
Non married (Reference)	52.3%	Male	71.8%
Education		Female (Reference)	28.2%
No formal education (Reference)	23.38%	Poverty incidence	
Primary incomplete	41.63%	Poor	51.1%
Primary complete	18.42%	Non poor(Reference)	48.9%
Secondary incomplete	12.14%	Poverty depth	0.39 (mean)
Secondary complete	2.73%	Number of infants (0-5 years)	
University	1.69%	0	41.1%
		1	28.6%
		2	23.2%
		3	6.6%
		4	0.4%
		5	1.1%
		Number of children (6-14 years)	
		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.

⁹ As the unit of analysis is the individual, each individual is attributed the characteristics of the household he or she belongs to.

As usually happens, some limitations were foreseen with this data. Time-use surveys are the most suitable for time allocation analysis, as they are based on daily diaries filled in by the respondents that indicate with high precision the activities done. Unfortunately, time use surveys have not yet been conducted in many developing countries and Rwanda is no exception. This limitation notwithstanding, an attempt was made to use this data with some caveats as to the eventual conclusions.

3.2 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 activity; that is, market-related work or domestic activities. Consequently, the dependant variables used have many zero values. Thus, the data used is censored at zero, and we need to apply a censored regression model known as the “Tobit model”, a non-linear model using maximum likelihood estimation techniques.

3.2.1 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 uses maximum likelihood estimation techniques. The likelihood function for the Tobit model takes the form:

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

3.2.2 Interpreting Tobit estimates

Interpreting estimated coefficients from the Tobit model is somewhat 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 .

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

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

and thus correspond to the marginal effect of x on the latent variable y^* , not to the observed variable y . Sometimes y^* is of interest but usually it is not. What is really needed is the marginal effect of x on y , and therefore the expected value of y , conditional on y being greater than zero, as 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 . STATA 10.1 is used to estimate the marginal effects of each independent variable on time spent on market-related work and also on domestic activities.

4. Estimation and interpretation of results

This section is the dedicated to the presentation and interpretation of the main findings of the study.

4.1 Sharing of domestic activities and market-related work between men and women in Rwanda

Table 2 presents the proportion of men and women participating in each type of activity, and the average hours spent per week by an individual on each type of activity, disaggregated by sex.

The results confirm that a higher proportion of women (89 per cent) perform household chores, while only 54 per cent 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 one considers market-related work, the difference is not as marked as in the previous case. 71 per cent of men are involved in productive activities, while the proportion for women is 73 per cent, but when it comes to the number of hours, women spend less time on productive activities than men: 21 and 26 hours, respectively.

The conclusion from these results is that a higher proportion of women perform both domestic and market related activities, but females tend to spend much of their time on household chores rather than on the job market. Since these domestic activities are not paid, a large proportion of women continue to depend on their husbands, who are considered breadwinners, therefore limiting the bargaining power of women in their households.

Table 2: Incidence and duration of domestic activities & market-related work per week by gender

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

Source: Author's estimation based on 2005/2006 Rwanda Household Integrated Survey.

Note: Individual aged 15 years and over. Results weighted.

Table 3 displays the results on time spent on domestic activities and market-related work by gender and place of residence. It shows that 90 per cent of women in rural areas are involved in household activities compared to 56 per cent of their male counterparts. The participation is higher in rural areas for both sexes than for those living in urban areas.

As regards market work, the proportion of participation is higher for women in rural areas (76 per cent). As noted for domestic activities, the participation in market-related work is also higher in rural areas for both sexes with respect to those living in urban areas. One tentative explanation may be the fact that, in rural areas, almost everyone in the household participates in agricultural activities. In fact, since dwellings in Rwanda are still scattered, most of the population live surrounded by their land. This enables individuals – especially women – to perform both domestic and farming activities. However, men and women in rural areas spend less time on market-related work as compared to their counterparts in urban areas. This is due to the fact that the agricultural activities predominant in rural areas are mostly performed before noon and depend on the seasons, which is why underemployment is higher in rural areas.

Table 3: Incidence and duration of domestic activities and market-related work per week by sex and place of residence

		Urban		Rural	
Domestic activities		Men	Women	Men	Women
	Incidence (%)	43.4	84.7	56.4	90.4
	Duration (mean hours)	5.4	24.4	5.1	23.3
	Incidence x Duration	2.3	20.6	2.9	21.
Market work					
	Incidence (%)	67.3	60.4	71.9	76.3
	Duration (mean hours)	34.9	26.9	24.1	20.2
	Incidence x Duration	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 over. Results weighted.

The results in the two tables above provide enough evidence to conclude that in Rwanda there is a gender-based division of labour. Women spend four times more time on domestic activities (18 hours more) than men, while the same women spend less time on market-related work compared to men. However, the difference in market-related work is less (by 5 hours), implying that women are double-burdened, and signalling the possibility that women in Rwanda may experience time poverty. This issue could be assessed in further research.

Table 4 presents time allocated to domestic activities and market-related work by gender according to the number of children in the household. The gap, represented by the hours spent by men less the hours spent by women, is also shown. The common trend is that while the time spent on domestic activities increases for women as the number of children increases, it is the other way round for men. As the number of children increases, men devote less time to domestic activities. However, as far as market-related work is concerned, its relationship with the number of children seems indistinct and will be clearly assessed in the model.

Table 4: Hours spent on domestic activities and on market-related work by gender 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 or 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 over. Results weighted.

Table 5 presents the time allocated to domestic activities and market-related work with respect to the level of education. The 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-related work the gap seems to be small within each category of education. Men spend more hours on this activity, except at university level, where women spend one hour more per week compared to their male counterparts.

Table 5: Hours spent on domestic activities & market-related work by gender & 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 over. Results weighted.

4.2 Determinants of time spent on domestic activities

The analysis starts with a model for both men and women, and is followed by two gender-specific models.

Table A1 presents the marginal effects of individual and household characteristics on time spent on domestic activities. The results suggest that being a female in this country increases the time devoted to domestic activities by 25 hours per week. The same results suggest that when a woman gets married, her housework load increases by almost four hours per week, while for men, being married reduces the time spent on household chores by 11 hours per week.

Those who completed secondary school spend eight hours less on domestic activities than those without an education. However, at 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 when individuals have a university level qualification is higher.

Women in rural areas spend fewer hours on household chores with respect to their urban counterparts (4 hours less). However, the type of area – rural or urban – does not affect the time men spend on domestic activities.

As regards the poverty status of the household, both men and women living in poor families spend fewer hours on domestic activities as compared to non-poor. Related to this, there is ample evidence that the deeper the level of poverty of the household, 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 little land. These limitations restrict agricultural and livestock-related activities, which normally account for the bulk of domestic work.

In addition, the child care 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 five hours per week for women and only two for men. Having an additional child (aged 6-14 years) increases the time spent by women on household chores by two hours while the corresponding effect on the time spent by men on such chores is not significant. It is clear that young children increase the hours spent on domestic work to a greater extent as they need much more care; when they grow up they start taking care of themselves and helping in various domestic activities such as fetching water, cooking, and so forth.

The size of the household has a negative effect on time spent on domestic activities by both men and women. An additional member of the household decreases the time allocated to domestic chores by one hour for men and almost three hours for women per week. Furthermore, being in a household with a male head increases the time devoted to domestic activities by four hours for men and by almost five hours for women as compared to those living in female-headed households.

4.3 Determinants of time spent on market-related work

Table A2 presents the marginal effects of different covariates on time spent on market-related work. Gender is an important determinant of time spent in the labour market. Results suggest that being a woman decreases the time spent on market-related work by five hours as compared to men.

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

As regards 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 four hours. The hours spent on market-related work start to decrease almost proportionally for both sexes from secondary level onwards.

Surprisingly, both men and women with university level education spend 11 hours less on market-related tasks 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. For this reason they are induced to work more hours.

The area of residence is also an important determinant. Men and women in rural areas work fewer hours in comparison with their urban counterparts: 13 and 8 hours less, respectively.

Members of poor households spend less time on market-related work as compared to non-poor households for both sexes. This also applies to poverty depth: the poorer the household, the less its members work in the labour market, this being valid for both men and women. This may be a signal of a link between poverty and visible underemployment which can be assessed in future studies.

The size of the household also has a significant negative effect on time devoted to market-related work. An additional member of the household reduces time devoted to such work by other household members.

The gender of the household head has no effect on men in this context. Indeed, women residing in male-headed household work five hours less in the labour market compared to their counterparts in female-headed households. This is an expected finding: 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 breadwinners – although this is changing – and some married men consider their spouses to be housekeepers, thereby limiting their participation in the labour market.

In attempting to analyse the influence of children, it was found that one additional infant (0-3 years) increases the weekly market-related time spent by household members by three hours for men and two hours for women, implying that both work more. This contradicts the belief that the presence of infants limits the hours women spend on market-related work. On the contrary, women tend to accumulate both market-related work and child care duties. This result is inherent in the long tradition of Rwandan women 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, in particular in the case of households involved in agriculture.

The presence of an additional child (6-14 years) in the household affects the time spent on market-related work only for women – that is, one hour more; for men it is insignificant. Based on these results, it is clear that men specialize in market-related work while women are double-burdened, performing both market-related and domestic activities.

5. Conclusions

This study addresses the issue of gender differences with respect to time allocation between market-related and domestic activities. Data was analysed from the Household Integrated Survey conducted in Rwanda in 2005. The methodological approach was defined in two steps. First, it set out a descriptive analysis assessing the incidence and duration of both market-related and domestic activities for both sexes. Second, a Tobit model was applied to estimate the effect of each determinant on both types of work, separately for men and women.

Overall, it was 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, while women spend fewer hours in the labour market, the difference is very small compared to the large gap between men and women when domestic activities are considered. This fact implies that women are double-burdened and tend to accumulate both types of work while men concentrate on market-related work.

It is noteworthy that, *inter alia*, education has a significant effect on time allocation between domestic and market-related activities for both men and women. The number of hours spent on either type of work diminishes as an individual advances in education, especially for those men and women who manage to reach university level.

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-related work by both sexes, thereby signalling gender asymmetry in the time devoted to child care in Rwanda.

Finally, given the limitations of the data, it is recommended that further studies are undertaken on this topic. These should include, *intra alia*, access to basic infrastructure such as water, electricity and child care facilities, and data on wages and earnings which may be potential determinants of time allocated to household chores and market-related work, respectively. Furthermore, there is a need to conduct time use surveys in Rwanda to allow a meticulous and complete analysis.

References

- Amin, S. and Luciana, S. (2008). 'Terms of Marriage and Time-Use Patterns of Young Wives: Evidence from Rural Bangladesh', Working paper, Population council, New York.
- Aslihan, K. and Hema, S. (2006). 'Gender and Time Poverty in Sub-Saharan Africa', World Bank working paper No 73, p. 13-39, The World Bank.
- Barnett, T. and Whiteside, A. (2002). 'Poverty and HIV/AIDS: Impact, Coping, and Mitigation Policy', *In AIDS, Public Policy and Child Well-being*. Florence, Italy: UNICEF-IRC.
- Blackden, M. and Quentin, W. (2006). 'Gender, time use and poverty in Sub Saharan Africa', World Bank working paper No 73, p.1-11, The World Bank.
- Blackden, M. and Canagarajah, R. (2003). 'Gender and Growth in Africa: Evidence and Issues', Paper presented at UNECA Expert Meeting on Pro-Poor Growth, June 23–24, Kampala, Uganda.
- Bloemen, H., Pasqua, S. and Stancanelli, E. (2008). 'An Empirical Analysis of the Time Allocation of Italian Couples: Are Italian Men Irresponsive?', Thema Working paper n°2008-30, Université de Cergy Pontoise, France.
- Breen, R. and Cooke, L. (2004). 'The Persistence of the Gendered Division of Domestic Labour', Research paper, Nuffield College, UK.
- Burda, M. et al. (2012). 'Total Work and Gender: Facts and Possible Explanations', SFB 649 Discussion Paper 2012-007.
- Cohen, P. (2004). 'The gender division of labor: "Keeping House" and Occupational Segregation in the United States', *GENDER & SOCIETY*, Vol. 18 No. 2, April 2004 239-252.
- David, L. (2007). 'A Gendered analysis of time poverty: The Importance of Infrastructure', Research paper, GPRG-WPS-078.
- McGinnity, F. and Russell, H. (2008). 'Gender inequalities in time use: The distribution of caring, housework and employment among women and men in Ireland', Working paper, the Economic and Social Research Institute, Dublin; Brunswick Press.
- International Labour Organization (2010). 'Rwanda forging ahead: The challenge of getting everybody on board', Employment working paper, Geneva.
- Luis, O. (2005). 'Leaving the Labour Market: Event-History Analysis of the Female Workers' Transition to Housework in Denmark, Germany, Great Britain and Spain', Research paper, Universitat Pompeu Fabra.

Mancini, L and Pasqua, S. (2010). 'Asymmetries and interdependencies in time use between Italian parents', *JEL: D1*, J13, J22.

Marcelo, M., Rafael, G. and Joana, C. (2007). 'Gender inequalities in allocating time to paid and unpaid work: Evidence from Bolivia', Working Paper No 495, The Levy Economics Institute, NY.

Ministry of Finance, NISR (2006). 'Labour market and economic activity trends in Rwanda', Final report.

National Institute of Statistics of Rwanda (NISR), Ministry of Health (MOH) [Rwanda], and ICF Macro (2009), 'Rwanda Interim Demographic and Health Survey 2007-08', Calverton, Maryland, U.S.A.: NISR, MoH and ICF Macro.

Quentin, W. and Yvonne, Y. (2010). 'Domestic work time in Sierra Leone', World Bank's Africa Development Forum, p. 333-356, Washington, DC: World Bank.

Ritchie, A., Lloyd, C.B, and Grant, M. (2004). 'Gender Differences in Time Use Among Adolescents in Developing Countries: Implications of Rising School Enrollment Rates', Policy Research Division Working Paper No. 193, New York: Population Council, Inc.

Saba, J., Ewa, F., and Kolev, A. (2010). 'Why study gender disparities in Africa's labor markets?', Africa Development Forum, p. 1-19, Washington, DC: World Bank.

Saito, K.A. (1994). 'Raising the productivity of women farmers in Sub-Saharan Africa', Washington, D.C.: The World Bank.

Suárez, R. (2010). 'Gender disparities in time allocation, time poverty, and labor allocation across employment sectors in Ethiopia', Africa Development Forum, p. 299-332, Washington, DC: World Bank.

Toffanin, T. (2009). 'Gender inequality in work-life balance', *Working paper*, European Working Observatory, available at <http://www.eurofound.europa.eu/ewco/2008/10/IT0810069I.htm>

UNICEF (1999). 'Women in Transition', Florence, Italy: UNICEF Innocenti Research Centre

World Bank (2006). 'What Africa Needs to Do to Spur Growth and Create More Well-Paid Jobs', Federal Ministry for Economic Cooperation and Development, Policy Note 2, World Bank, Washington DC.

Xavier, R. (2005). 'Domestic work time and gender differentials in Great Britain 1992-1998: What do "new" men look like?', *International Journal of Manpower*, Vol. 26 Iss: 3, pp. 265 –295.

Xinyu, C. and Yanwei, C. (2007). 'Gender-Role Based Differences in Time Allocation: A Case Study of Shenzhen', Research paper, Peking University Beijing 100871, China.

Annex A: Determinants of time spent on domestic and market related activities

Table A1: Marginal effects of individual and household characteristics on hours spent on domestic activities per week by sex

VARIABLES	(1) All	(2) Male	(3) Female
Individual characteristics			
female	25.1239*** (71.07)		
married	-3.3969*** (-7.37)	-10.8151*** (-16.58)	3.6968*** (5.70)
Primary incomplete ¹⁰	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)
Household characteristics			
	(-18.99)	(-8.43)	(-19.25)
	(-3.61)	(1.47)	(-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)
	-3.5846*** (-4.02)	-3.8866*** (-3.29)	-3.3075*** (-2.76)

¹⁰ No formal education is the reference category.

Table A1: *Continued*

VARIABLES	(1) All	(2) Male	(3) Female
Infant(0-5)	3.5514***	1.9066***	5.0947***
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)

Results weighted; Robust t-statistics in parentheses

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

Individual aged 15 years and over.

Table A2: Marginal effects of individual and household characteristics on hours spent on market-related work per week by gender:

VARIABLES	(1) All	(2) Male	(3) Female
Individual characteristics			
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)
Household characteristics			
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)
Poverty depth			
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

Individual aged 15 years and over.