

ETHIOPIAN TIME USE SURVEY GENDER TIME USE IN-DEPTH ANALYSES REPORT *FINANCED BY THE WORLD BANK THROUGH SFR PROJECT*

**HOW-
WOMEN
AND
MEN
SPEND
THEIR
TIME**



**CENTRAL STATISTICAL AGENCY
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA**



DECEMBER 2016
ADDIS ABABA, ETHIOPIA



19/08/09 AEC-004938 43



ETHIOPIAN TIME SURVEY
GENDER TIME USE IN-DEPTH ANALYSES REPORT
FINANCED BY THE WORLD BANK THROUGH SFR PROJECT

CENTRAL STATISTICAL AGENCY
FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA

DECEMBER 2016
ADDIS ABABA, ETHIOPIA

Contents

Acronym.....iv

List of Tables.....iv

List of Figures.....v

Executive Summaryvi

1. Introduction.....1

 1.1. Background.....1

 1.2. Objectives and Scope of the In-depth Analysis.....1

2. Conceptual Framework for Time use and Time Poverty3

 2.1. A Framework for Analyzing Time Use and Time Poverty3

 2.2. Time Poverty Measurement.....5

 2.2.1. Head count index of Time Poverty5

 2.2.2. Time Poverty Gap.....5

 2.2.3. Squared Time Poverty Gap5

 2.3. Time Poverty Line5

3. Theoretical model of Time Allocation6

 3.1. Becker Model of Time Allocation.....6

 3.2. The Gronau Model of Time Allocation7

 3.3. The Gronau– Hamermesh Model of Time Allocation.....8

4. Determinants of Time Allocation and Time Poverty9

 4.1. Determinants of Time Allocation.....9

 4.1.1. Developing Countries.....9

 4.1.2. Developed Countries11

 4.2. Determinants of Time Poverty12

5. Methodology14

 5.1. Data and Data Source.....14

| | | |
|--------|--|----|
| 5.2. | Model Specification: The Gronau– Hamermesh Model of Time Allocation..... | 14 |
| 5.3. | The Econometric Model | 16 |
| 6. | Analysis of Time Poverty | 19 |
| 6.1. | Introduction | 19 |
| 6.2. | Analysis of the Time Poverty Indicators..... | 19 |
| 6.2.1. | Time Poverty by Region..... | 20 |
| 6.2.2. | Time Poverty by Gender and Region..... | 20 |
| 6.2.3. | Time Poverty by Location and Gender..... | 21 |
| 6.2.4. | Time Poverty by Religion and Gender | 23 |
| 6.2.5. | Time Poverty by Education Level and Gender | 25 |
| 6.3. | Analysis of Time Poverty of Adults | 26 |
| 6.3.1. | Time Poverty for Adult Males by Region | 26 |
| 6.3.2. | Time Poverty for Adult Females..... | 28 |
| 6.3.3. | Time Poverty for Adults by Location..... | 29 |
| 6.4. | Time Poverty for Adults by Religion and Marital Status | 30 |
| 6.4.1. | Time Poverty for Adult Males by Religion..... | 30 |
| 6.4.2. | Time Poverty for Adult Females by Religion..... | 32 |
| 6.5. | Time Poverty for Adults by Education, Gender and Marital Status..... | 33 |
| 6.5.1. | Time Poverty for Adult Male by Education and Marital Status | 33 |
| 6.5.2. | Time Poverty for Adult Females by Schooling and Marital Status | 34 |
| 6.6. | Time Poverty of Boys and Girls..... | 34 |
| 6.6.1. | Time Poverty for Boys and Girls by Region | 35 |
| 6.6.2. | Time Poverty for Boys by Region..... | 35 |
| 6.6.3. | Time Poverty for Girls by Region..... | 36 |
| 6.6.4. | Time Poverty of Boys and Girls by Rural/Urban | 37 |

| | | |
|-----------------|---|----|
| 6.6.5. | Time Poverty of Boys and Girls by Religion..... | 38 |
| 6.6.6. | Time Poverty of Boys and Girls by Level of Schooling..... | 39 |
| 6.7. | Results of the Econometric Model..... | 41 |
| 6.7.1. | Determinants of Market Work Time Allocation..... | 41 |
| 6.7.2. | Determinants of Unpaid Work Time Allocation..... | 44 |
| 6.7.3. | Determinants of None Productive Activity Time Allocation..... | 46 |
| 6.7.4. | Correlates of Time Poverty: Probit Results..... | 48 |
| 7. | Conclusions and Recommendations..... | 53 |
| 7.1. | Conclusions..... | 53 |
| 7.2. | Recommendations..... | 54 |
| Annex..... | | 56 |
| References..... | | 61 |

Acronym

| | |
|------|--------------------------------|
| CSA | Central Statistics Agency |
| EA | Enumeration Area |
| ETUS | Ethiopian Time Use Survey |
| FGT | Foster, Greer & Thorbecke |
| GTP | Growth and Transformation Plan |
| HH | Household |
| M&E | Monitoring and Evaluation |
| MLE | Maximum Likelihood Estimation |
| OLS | Ordinary Least Square |
| SNA | System of National Accounts |
| SSA | Sub-Saharan Africa |
| TUS | Time Use Survey |

List of Tables

| | |
|--|----|
| Table 6-1: Lower and Higher Threshold Time Poverty Index by Region | 20 |
| Table 6-2: Lower and Higher Threshold Time Poverty Index for Male and female by Region..... | 21 |
| Table 6-3: Lower and Higher Threshold Time Poverty Index for Male and female by religion..... | 24 |
| Table 6-4: Lower and Higher Threshold Time Poverty Index for Male and female by Level of Schooling .. | 26 |
| Table 6-5: Lower and Higher Threshold Time Poverty Index for Adult Men by Region | 27 |
| Table 6-6: Lower and Higher Threshold Time Poverty Index for adult married men by region..... | 28 |
| Table 6-7: Lower and Higher Threshold Time Poverty Index for Adult Female by Region..... | 28 |
| Table 6-8: Lower and Higher Threshold Time Poverty Index for married women by region..... | 29 |
| Table 6-9: Lower and Higher Threshold Time Poverty Index for adult male by Urban/Rural | 30 |
| Table 6-10: Lower and Higher Threshold Time Poverty Index for Adult Female by Urban/Rural | 30 |
| Table 6-11: Lower and Higher Threshold Time Poverty Index for Adult Male by Level of Schooling..... | 34 |
| Table 6-12: Lower and Higher Threshold Time Poverty Index for Adult Female by Level of Schooling..... | 34 |
| Table 6-13: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Region..... | 35 |
| Table 6-14: Lower and Higher Threshold Time Poverty Index for Boys by Region | 36 |
| Table 6-15: Lower and Higher Threshold Time Poverty Index for Girls by Region..... | 37 |
| Table 6-16: Lower and Higher Threshold Time Poverty Index for Boys by Urban/Rural | 37 |
| Table 6-17: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Religion | 38 |
| Table 6-18: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Level of Schooling | 40 |
| Table 7-1: Determinants of time allocation of married person (marginal effects): Market work time | 42 |
| Table 7-2: Determinants of time allocation of married men (marginal effects): Market work time | 43 |
| Table 7-3: Determinants of time allocation of married women (marginal effects): Market work time ... | 43 |
| Table 7-4: Determinants of time allocation of boys and girls (marginal effects): Market work | 44 |
| Table 7-5: Determinants of time allocation of married person (marginal effects): Unpaid Work Time | 45 |
| Table 7-6: Determinants of time allocation of boys and girls (marginal effects): Unpaid Work Time..... | 46 |

| | |
|---|----|
| Table 7-7: Determinants of time allocation of married person (marginal effects): None Productive Activity Time..... | 47 |
| Table 7-8: Determinants of time allocation of Boys and Girls (marginal effects): None Productive Activity Time..... | 48 |
| Table 7-9: Determinants of time poverty of married person (marginal effects)..... | 49 |
| Table 7-10: Determinants of time poverty of boys and girls (marginal effects)..... | 50 |
| Table 7-11: Determinants of time poverty of boys (marginal effects)..... | 51 |
| Table 7-12: Determinants of time poverty of girls (marginal effects)..... | 52 |

List of Figures

| | |
|---|----|
| Figure 2-1: A Framework for Analyzing Time Use and Time Poverty..... | 4 |
| Figure 6-1: Lower and Higher Threshold Time Poverty Index by Urban/Rural..... | 22 |
| Figure 6-2: Lower and Higher Threshold Time Poverty Index for Male and female by Urban/Rural..... | 23 |
| Figure 6-3: Lower and Higher Threshold Time Poverty Index by Religion..... | 24 |
| Figure 6-4: Lower and Higher Threshold Time Poverty Index by Level of Schooling..... | 25 |
| Figure 6-5: Lower and Higher Threshold Time Poverty Index for Adult Male by Religion..... | 31 |
| Figure 6-6: Lower and Higher Threshold Time Poverty Index for Married Men by Religion..... | 31 |
| Figure 6-7: Lower and Higher Threshold Time Poverty Index for Adult Female by Religion..... | 32 |
| Figure 6-8: Lower and Higher Threshold Time Poverty Index for Married Women by Religion..... | 33 |
| Figure 6-9: Lower and Higher Threshold Time Poverty Index for Girls by Religion..... | 38 |
| Figure 6-10: Lower and Higher Threshold Time Poverty Index for Boys by Religion..... | 39 |

Executive Summary

The main objective of this study was to estimate the time poverty in Ethiopia and analyse the factors that influence time allocation to different activities. The data used for the study is the time use survey conducted by the Central Statistical Agency (CSA) in 2013. This report analyzes good-being on an individual level through the allocation of time or work hours done by different segments of the society including adults and children. In doing so, the Foster, Greer and Thorbecke (FGT) framework has been adapted into a time poverty model. In addition, econometric models were employed to identify the relative importance of factors influencing time allocation and probability of being time poor in both rural and urban areas.

Key findings:

There is no significant difference between men and women in terms of time poverty. Based on the lower time poverty line as a reference, about 43.4% of individuals are time poor, and there is no significance difference between males and females in terms of the headcount time poverty indicator. Similarly, the average time poverty gap is also nearly the same for males and females. However, the severity of the time poverty is slightly higher for males than females.

Marital status matters for time poverty. The proportion of time-poor individuals among adult men, considering the lower limit of the time poverty line, is 32.44%. In terms of marital status, about 43.11% of married men are time poor. This in general gives a highlight that adult married men are time poor compared with adult men. Likewise, about 44.42% of married women are time poor, slightly higher than married men. Probably, married women are more time-poor because they allocate more time for housework and childcare and related activities.

Location and gender matter for time poverty. The incidence of time poverty is higher in rural areas, while poverty gap and severity are higher in urban areas. Note also that urban men are more time poor than rural men, and the time poverty gap and severity are higher for urban men than rural men. The three indicators of time poverty are slightly higher for urban men than rural men. This could be due to the fact urban men is expected to do more to satisfy the living demands of the urban life. Rural men would also take religious holidays as opportunity for leisure time.

Comparing the time poverty of rural and urban women, rural women are more time poor than the urban women: rural women are relatively time poor (45.3%) compared with urban women (37.2%). Both time poverty gap and severity are also higher for rural women compared with urban women. This could attribute to a relatively developed infrastructure in urban areas which would ease time-consuming activities for urban women. As noted above, urban men are time poor than rural men which could also be related to sharing responsibilities, i.e. urban men could share the burden of urban women.

In terms of regional variation, the highest shares of time poor are observed in Addis Ababa (50.7%) and Somali (49.6%). Gambela witnessed the lowest in terms of the share time poor individuals (32.2%).

Time poverty varies with religion. Waqefeta followers are more time poor (51.2%) than others while catholic followers are relatively less time poor (32.7%). Looking at other religions, a large proportion of Muslim and Orthodox religion followers, which constitute major followers in the country's population, are also time poor. It appears that religious persons tend to be time poor and this could due to different

reasons. Spending time on religious services, among others, would be another factor which lessens the leisure time of those people.

The level of schooling also determines time poverty of individuals. Illiterate people are the highest time poor (49.7%) compared with individuals with some education background. The lowest time poverty is observed in low schooling level of education. While the time poverty gap seems quite similar to that of the incidence of time poverty, poverty severity is relatively higher in top schooling and middle schooling.

Age matters for time poverty. The time poverty of boys and girls is different from adult males and females. About 41.27% of boys and girls are time poor, higher than that of adults. On average, about 43.55% of boys are found to be time poor, compared with 38.8% of the girls. Comparing regions, Somali region is the home for a large proportion of time poor boys and girls, while the least is recorded in Harari. In the same way, time poverty gap is highest in Somali region and the least is recorded in Addis Ababa. Time poverty severity is also the highest for Somali region and the least is in Harari. Hence, it can be seen that boys and girls are time poor particularly in the pastoralist regions of the country.

Rural boys and girls are time poorer than urban boys and girls. The time poverty gap and severity are also considerably higher for the rural boys and girls. Comparing the rural and urban boys, similar trends are observed, i.e. rural boys are time poorer than their urban counterparts and poverty gaps and severity are substantially higher for rural boys than girls. In terms of education, illiterate boys and girls are the highest time poor compared with others. Similarly, both time poverty gap and severity are highest for illiterate boys and girls, while time poverty gap is least for boys and girls with twelve and above years of schooling (top schooling).

The econometric results provide some insights regarding the relative importance of factors influencing time allocation to different activities and correlates of time poverty. The following findings can be highlighted from the econometric results.

The likelihood of time allocation declines for married people who are illiterate compared with married individuals with low and traditional education. The positive marginal effect that was estimated about wage reveals that allocating time for market work increases as wage increases. After all, in general terms, higher wage levels might be associated to intense job market activity which leads to increase allocation of time for market work. However, as level of income increases, market work time decreases. Income enables individuals to allocate more time to other activities such as leisure.

The evidence of allocation of time for market work increasing as an individual is younger and diminishing as he or she gets older seems to hold. This could be due to the fact that as married individuals grow older, the strength to be involved in market work tends to decrease. The time trajectory throughout one's life turn out to get an inverted U-shape. This indicates that the marginal effects are positive for younger individuals and negative for senior ones, revealing that allocating time market work tends to diminish after a certain age.

Demographic and other factors also matter for time allocation. The result indicates that the time allocation of married men for market work is influenced by number of children, i.e. the increase in the number of children is often associated with larger workloads. This involves relatively high number of hours spent on domestic and care duties by married person.

Among educational variables, only traditional schooling is negatively associated with the time allocation of married men. Married men residing in Addis Ababa tend to allocate more time to market work compared with married men in other regions.

The determinants of time allocation of boys and girls are broadly similar to that of adults. Income appears to be negatively associated with time allocation for market work due to substitution effect as boys and girls tend to allocate time for other activities including leisure. Boys and girls in rural areas tend to allocate less time for market work compared with those in urban areas.

The probability of a married person to be time-poor increases as an individual is younger and diminishing as he or she gets older. This means that the time poverty trajectory throughout one's life turn out to get the shape of an inverted-U and that time poverty tends to diminish after a certain age.

Dependence on wood and animal dung as a source of energy increases the chances of being time-poor for married person. For instance, the likelihood of being time-poor increases with distance to fetch water. On the other hand, improved infrastructure facilities such as access to pipe water and water good reduces the chances of a married person being time-poor as these shorten the time required to fetch water. There are also geographical differences in the probability of being time poor according to Ethiopia's regions. For example, the probability of a married person to be time-poor is lower for people living in Afar compared with those in Addis Ababa.

Among the time poverty determinants, wages tend to increase the probability of boys and girls to be time-poor while income tends to lessen such probability. Here both substitution and income effects work. At higher wages, boys and girls are likely to avail more time for work and less time for leisure. While the probability of being time poor declines with income levels as it allows boys and girls to enjoy leisure. However, higher wages puts pressure on boys and girls to work long hours by substituting leisure for work thereby increasing the likelihood of being time poor.

Infrastructural facilities are also correlated with time poverty of boys and girls. Access to water good and piped water are negatively correlated with the probability of time poor for girls. Such results are sensible given that improved access to water drinking or other purposes shortens the time required for girls to fetch water as girls, especially in rural areas are responsible for fetching water. For boys, water good is negatively correlated with time poverty and is statistically significant. Overall, improved access to water is statistically lessens the likelihood of being time poor for both boys and girls.

Recommendations:

In light of the above findings, the following recommendations are made, especially to improve the contribution of the non-market activities to the Ethiopian economy.

Recognize the problem: Awareness creation: Given that there a huge cost to the society in terms of high time poverty, it is recommended that continuous awareness creation needs to be done at all levels. Balancing the amount of time spent on unpaid work between men and women could reduce the work load of women and allow more women to enter the workforce.

Accounting for non-market activities: The time use analysis shows that in rural Ethiopia women disproportionately suffer from time poverty because they systematically add up domestic and care duties (reproductive work) to their market or non-market productive work so that this double time-budget makes of time a resource which is more scarce for women than for men. However, these tasks are not accounted in national accounts and thus, remain invisible in the economy. It is recommended that there is a need to expand the national income accounting to take into account non-market activities.

Access to improved technologies: It is recommended to improve access to modern energy, especially in rural areas. In particular, efficient improved cooking technologies (e.g. improved cook stoves) have multiple benefits including improve health, reduce air pollution, and more time for boys and girls for study. For example, affordable energy in the home could mean people, especially women have access to ovens instead of having to take the time to chop firewood. This will also save time for boys and girls and focus on their education. Energy policy and investment priorities need to focus on alternative energy sources, and to address the domestic energy needs of households, focused on domestic requirements (notably for cooking fuel). Expanding labor-saving domestic technology relating to food processing has the potential to raise labor productivity and save time.

The time spent on unpaid work can be reduced through improved technologies. In rural areas, it is recommended to improve access to agricultural technologies such as improved seeds that are drought- or pest-resistant which could reduce the time spent in the field.

Other infrastructure: Lack of market substitutes, basic social services and infrastructure are some of the factors that restrict subsistence households to family labor processes. This suggests that there is a need to expand improved infrastructural facilities including improved water services and transport services to reduce time poverty of women and children, particularly in the context of Ethiopia. In particular, improved access to water would reduce the time poverty by relieving some overload for adults, boys and girls.

Improved access to education would be another area of intervention to reduce time poverty, especially for boys and girls. This implies that education helps individuals to accomplish their activities in less time thus leaving more available time for leisure, i.e. education increases productivities of individuals.

Targeted interventions for greater impact: Given that time poverty has a special dimension, this requires designing interventions that take into account the economic, social and environmental characteristics of regions, i.e. 'one-size-fit all' does not work. For instance, boys and girls are time poor particularly in the pastoralist regions of the country such as Afar and Somali due to the nature of livelihoods as children look after livestock. In the pastoral areas, access to mobile schools could help reduce the proportion of time poor boys and girls. In addition, improve irrigation facilities and provision of improved livestock breeds could help improve livestock productivity, thereby reducing time poverty of pastoralists.

Improving M&E: There is a need to establish transparent and robust methods of monitoring and evaluation of non-market activities. In light of this, it is crucial to design a consistent, comprehensive and clear monitoring and evaluation mechanisms for adequate measurement, reporting and feedback mechanisms for non-market activities. It is also recommended to develop relevant indicators for tracking the contributions of non-market activities to the national economy.

Improve statistics: It is recommended to strengthen domestic statistical capacity in collecting relevant information and data on non-market activities, i.e. information on non-market activities need to be mainstreamed into the regular data collection systems.

1. Introduction

1.1. Background

Now days, gender equality has become norm in all areas of societies. Universally accepted principles of human rights have set standard of equality between women and men. This concept extends to recognition that girls and women are unique individuals with rights and responsibilities similar to those of boys and men. Despite these internationally accepted principles women, in many parts of Sub-Saharan Africa (SSA), cope with various extra sets of responsibilities including food production, marketing food for income generation, household chores and care work. Social norms, which define gender roles, also leaves women with a heavy work burden. While men are generally able to focus on a single productive role, and play their multiple roles sequentially, women, in contrast to men, play these roles simultaneously and must balance simultaneous competing claims on limited time for each of them. Consequently, Women labour time and flexibility are therefore much more constrained than is the case for men and enjoy minimal or no leisure time. These constrained choices affect the good-being of women and their households.

Recent studies present evidence that the larger participation of women in unpaid work leads to both their reduced ability to generate income and to their higher dependency on men. The implication of which is that women are more vulnerable and more likely to be exposed to poverty. Moreover, this circumstance places a restriction on women's freedom to not only participate more intensively in the labour market achieving better career and generating higher income but also in other activities such as education and politics. Girls also help women with household work instead of doing homework or going to school. The importance of time allocation in gender issues is thus clear as an unequal allocation of time makes women vulnerable in an economic sense and it also places restrictions on their freedom.

To address the time allocation in gender issues in Ethiopia, the Central Statistical Agency of Ethiopia has conducted the first ever stand-alone Time Use Survey (TUS) in 2013 with an aim of providing a benchmark for setting baseline indicators in various sectors under the Growth and Transformation Plan (GTP) to minimize gender inequality gap on paid and unpaid works. This in depth analysis of the Ethiopian Time Use Survey (ETUS) is therefore to analyze the allocation of time estimating the determinants of the different types of works and measuring the unpaid contribution of women and men to society.

1.2. Objectives and Scope of the In-depth Analysis

The objective of this in-depth analysis is to analyse the time spent of the population on various activities at national, rural and urban levels and provide information to policy makers for policy interventions on gender equality and women empowerment along poverty reduction, welfare, social protection and service delivery dimensions overtime.

Specifically:

- I. By analysing the time spent of the population on various activities at national, rural and urban levels; and provide information on gender and women empowerment along poverty reduction, welfare, social protection and service delivery dimensions.
- II. To analyse the time spent of the population on various activities at national, rural and urban levels;

- III. Analyse the time use pattern of women and men and girls and boys to improve their social welfare;
- IV. Analyse the distribution of paid work and unpaid work among men and women so as to minimize gender inequality;
- V. To shed light about the mainstreaming of gender in the existing development programs and policies
- VI. Build methodological capacity of the CSA to conduct time use studies at regular basis;
- VII. Analyse policy implications of development planning issues;
- VIII. Provide information for policy makers and users to formulate policies in order to close the gender gap on paid and unpaid works between men and women, boys and girls.

2. Conceptual Framework for Time use and Time Poverty

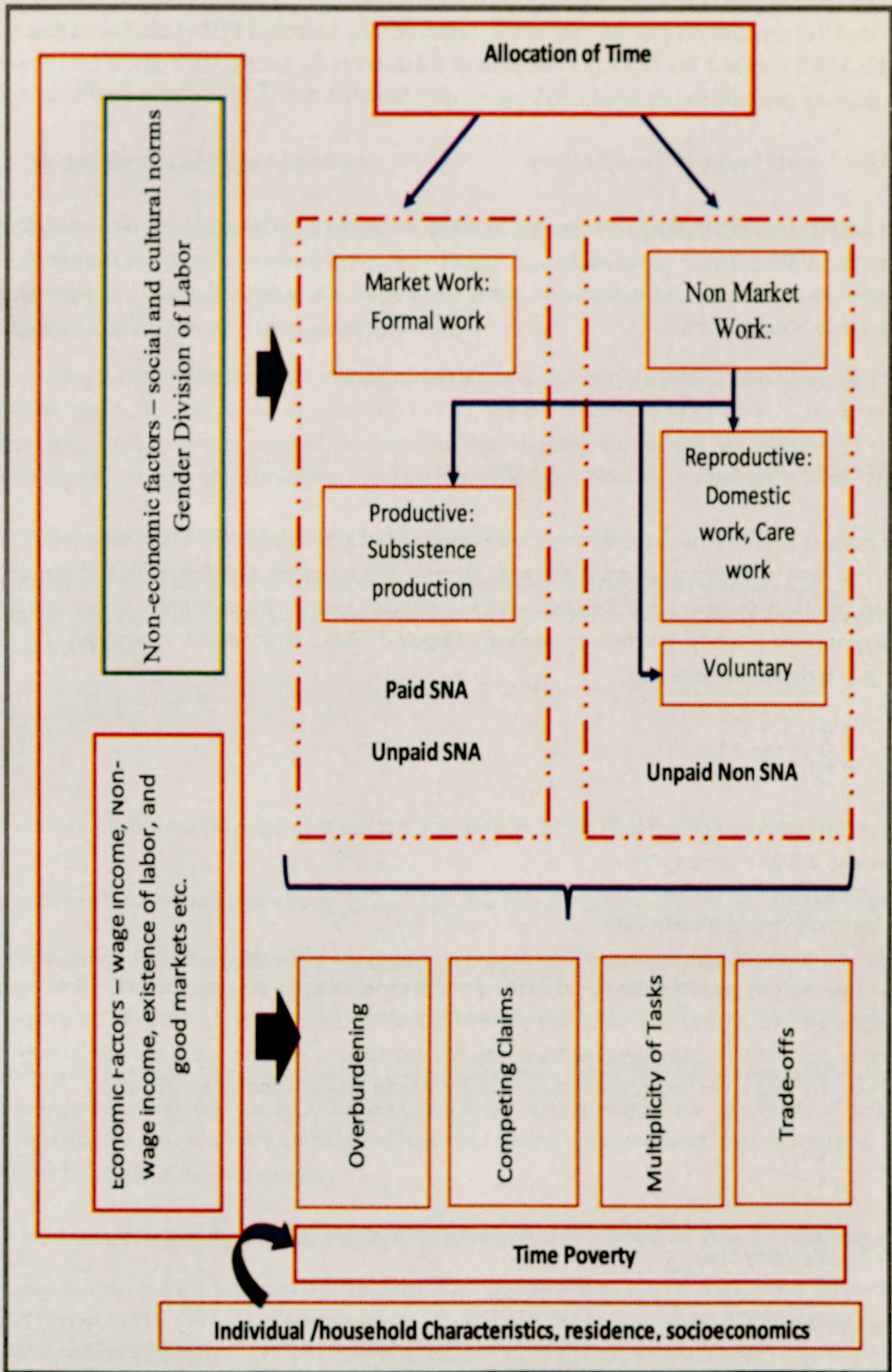
2.1. A Framework for Analyzing Time Use and Time Poverty

Currently there are two main approaches used to define and measure work. The first approach is the international statistical framework compiled in the System of National Accounts (SNA). SNA defines work in terms of formal and informal market work and non-market subsistence work for production of goods and services. This approach excludes non-market work producing services for own-consumption within the household. The second approach defines work and activity in a wider sense, and attempts to capture work activities and labor allocations that are not otherwise included in national accounts or economic analysis (Blackden & Wodon, 2006).

An individual's time use can therefore be broadly classified as market work and non-market work. Production of goods and services for the market is grouped under market economy activities and includes both formal and informal employment. The main activities that are included in the non-market, or household, economy are subsistence production, reproductive work, and volunteer work. Subsistence production concerns production of goods for home use that in principle could be marketed such as food, clothing, soft furnishings, pottery, and housing. Reproductive work includes activities such as preparing meals, laundry, cleaning, household maintenance, and personal care. Voluntary community work comprises unpaid activity in community and civic associations such as self-help groups of mothers organizing to run a soup kitchen or to secure improvements in neighborhood safety (Blackden & Wodon, 2006).

The links between individuals' time use and its circumstances might constitute "time poverty". In broad terms, time poverty can be understood in the context of the burden of competing claims on individuals' time that reduce their ability to make unconstrained choices on how they allocate their time, leading, in many instances, to increased work intensity and to tradeoffs among various tasks. Individuals and households at all income levels can experience time poverty as they engage in long hours of market and non-market work and have to choose between various activities. However, it can be surmised that where these tradeoffs become particularly severe, as is likely to be the case in households that are income poor, have fewer assets, and less available labor, time poverty may become a particularly important problem.

Figure 2-1: A Framework for Analyzing Time Use and Time Poverty



Source: (Blackden & Wodon, 2006)

2.2. Time Poverty Measurement

In most empirical research on poverty, poverty measures of the so-called FGT class (Foster, Greer, & Thorbecke, 1984) are used. The first three measures of this class are the head count index of time poverty, the time poverty gap, and the squared time poverty gap.

2.2.1. Head count index of Time Poverty

In a time poverty framework, the headcount index is the share of the population which is time poor, that is, the proportion of the population that works a number of hours y that is above a certain time poverty line, z . Suppose we have a population of size n in which q individuals are time poor. Then the headcount index of time poverty is defined as:

$$HD = \frac{q}{n} \quad \text{Eq 1}$$

2.2.2. Time Poverty Gap

The time poverty gap represents the mean distance separating the population from the time poverty line, with the non-time poor being given a distance of zero. This measures the time deficit of the entire population, in effect, the amount of time that would be needed to shift all individuals who are time poor below a given time poverty line through perfectly targeted "time transfers." Mathematically, the time poverty gap is defined as follows:

$$PG = \frac{1}{n} \sum_{i=1}^q \left(\frac{T_i - T}{T} \right) \quad \text{Eq 2}$$

Where T_i is total working hours of individual i , and the sum is taken only among those individuals who are time poor and T is time poverty line.

2.2.3. Squared Time Poverty Gap

While the time poverty gap takes into account the distance separating the time poor from the time poverty line, the squared time poverty gap takes the square of that distance into account. When using the squared time poverty gap, more weight is given to those who have extra-long working hours. Said differently, the squared poverty gap takes into account the inequality among the time poor. It is defined as:

$$SPG = \frac{1}{n} \sum_{i=1}^q \left(\frac{T_i - T}{T} \right)^2 \quad \text{Eq 3}$$

2.3. Time Poverty Line

Following Lawson (2007), Bardasi and Wodon (2006), Kalenkoskiet al. (2008) and Burchardt (2008), the time poverty line is calculated considering the total individual working hours (paid and unpaid). A lower threshold is assigned equal to 1.5 times the median of the total individual working hour's distribution; a higher threshold is assigned equal to 2 times the median. If a person spends more time than the social median on paid and unpaid work activities together then that person is identified as time poor. However,

for this study we define lower threshold poverty line as a mean work time in minutes per day plus a quarter of mean leisure time in minutes per day while the higher threshold poverty line as mean work time in minutes per day plus half of the mean leisure time in minutes per day.

3. Theoretical model of Time Allocation

3.1. Becker Model of Time Allocation

Becker's theory of allocation of time (Becker 1965) was the first to systematically incorporate time in economic models. Becker's household production theory assumes that the household behaves as if it maximizes a utility function defined over commodities, where these commodities are produced by the household using the inputs of market goods and time.

By maximizing the utility function subject to the technology, the time and the income constraints, the demand for market goods, the allocation of nonmarket time, and the household labor supply are determined simultaneously. Hence Becker created the foundational modeling framework for virtually all modern household level analyses of consumption and time use, called the -New Home Economics (Becker 1981).

The household is assumed to produce and consume a vector of commodities $Z = (Z_1 \dots Z_n)$. These commodities are associated with different levels of activities performed by the household (e.g., consumption of food, child-rearing, leisure activities), including leisure on the job. Utility is a function of these commodities:

$$u(Z_1 \dots Z_n) \tag{Eq 4}$$

Where

$$Z_i = f^i(X_i, T_i), \quad i=1, \dots, n \tag{Eq 5}$$

X_i is a vector of goods used to produce Z_i and T_i is time (usually assumed scalar but allowed to be a vector in Becker, 1965). The price of (Z_i), depends on the prices of its components. Assuming that each f^i is homogeneous of degree 1, one can construct a scale-invariant price index π_i for each commodity.

The household faces both time and traditional budget constraints. Rather than having one budget constraint for goods and another one for time, Becker's first insight is that, despite the complexity of nesting N production functions inside a utility function, the household can still simply trade off time for money, and so only faces the single budget constraint.

Under the assumption that T_i is scalar, and that the price of time is w across all uses, the maximum amount of income that the person can earn is full income $B = wT + v$ where $T = \sum_i T_i$ and v is the amount of unearned income accruing to the household. The Z_i encompass all activities in which time can be used and

$$\sum_{i=1}^N \pi_i Z_i = wT + v = B$$

Eq 6

The household is assumed to maximize (4) subject to (5) and (6). The demands for inputs X_i, T_i are derived demands.

3.2. The Gronau Model of Time Allocation

Gronau (1977) examined three time use categories—work, home production, and leisure. In 1977 Gronau revisited the Becker's Theory of Allocation of Time and tried to split the total work by an individual to - work in the market, work at home, and leisure. Time is used at home to produce home goods that can act as perfect substitutes for market goods, where home production is subject to diminishing marginal productivity. If the market wage rate increases, work at home diminishes, which may increase or decrease the leisure time of the individual. An increase in income increases leisure, reduces work in the market, and leaves work at home unchanged.

Formally, let there be a single-person household. Suppose the household derive utility from an activity Z that is "produced" with goods (X) and time (L), i.e., the person maximizes the amount of commodity, which is a combination of goods and services (X) and time (L),

$$U = u(Z_1(X_1, L_1), \dots, Z_n(X_n, L_n))$$

Eq 7

$$Z_i = Z_i(X_i, L_i) \quad , \quad i=1,2,\dots,n$$

Eq 8

Here, it is assumed that $U' > 0, U'' < 0$

The goods can either be purchased in the market or produced at home, but the composition of X does not affect Z . The value of home goods and services is represented by (X_H). Let X_M denote market expenditures; then total consumption is composed of the consumption of goods purchased in the market and those produced at home,

$$X = X_M + X_H$$

Eq 9

Home goods are produced by work at home (H),

$$X_H = f(H)$$

Eq 10

Subject to decreasing marginal productivity ($f' > 0, f'' < 0$). The decline in the value of marginal productivity at home is due not only to fatigue or changes in input proportions but also to a change in the composition of X_H -a shift, as H increases, toward activities that have a cheaper market substitute.

The maximization of Z is bound by two constraints: the (endogenous) budget constraint

$$X_M = wN + v \quad \text{Eq 11}$$

Where W is the person's wage rate (assumed to be constant), N denotes market work, and v other sources of income; and the time constraint:

$$L + H + N = T \quad \text{Eq 12}$$

The necessary conditions for an interior optimum call for the marginal product of work at home to equal the marginal rate of substitution between goods and consumption time, which in turn equals the shadow price of time, W^* . If the person works in the market ($N > 0$), it will also equal the real wage rate, W .

$$\frac{\partial Z / \partial L}{\partial Z / \partial X} = f' = w^* \quad \text{Eq 13}$$

$$\frac{\partial Z / \partial L}{\partial Z / \partial X} = f' = w = w^* \quad \text{Eq 14}$$

Equation (13) and (14) are derived by maximizing the Lagrangian function $G = ((X_M + f(H), L)) + \theta(wN + V - X_M) + \gamma(T - L - H - N)$ with respect to L, H, N , and X_M . The shadow price of time (measured in real terms) equals $W^* = \gamma / \theta$, where γ and θ are the marginal utilities of time and income, respectively.

The household will allocate time to home production until the marginal product of the home produced good is equal to the real wage (or the marginal cost of the market produced good). The above condition tells us that the optimal amount of goods and time consumed by the household for the activity Z is found at the point where the technical rate of substitution (TRS) in the activity production function is equal to real wage.

3.3. The Gronau–Hamermesh Model of Time Allocation

The model used to study the number of chosen activities comes from Gronau and Hamermesh (2001) and is based on Beckerian household production model with the objective of examining what determines the selection of chosen activities. In this context, the problem of consumer's choice can be reduced to a time allocation problem: How many hours have to be worked in order to purchase market goods and how many hours to devote to making basic commodities and consuming them. A detail of the Gronau – Hamermesh Model of time allocation is found in the model specification section of this study.

4. Determinants of Time Allocation and Time Poverty

4.1. Determinants of Time Allocation

Gender-differentiated time allocation between market and non-market work is affected by many factors. The most widely mentioned are household composition (age and gender composition of household members), sex of the respondent, marital status, education level, household size, wages, income level, number of infants (0-5 years) in the household, number of children (6-14 years) in the household, and regional and geographic factors (area of residence), including ease of access to water and fuel, availability of infrastructure, and distance to key economic and social services such as schools, health centers, financial institutions, and markets. Some studies also include social and cultural norms (Noh and Kim, 2015; Noh and Kim, 2015; Adeyonu, 2012; Bardasi and Wodon, 2009).

4.1.1. Developing Countries

Studies on time use patterns in developing countries showed a remarkable division of labor based on gender (Noh and Kim, 2015; Bardasi and Wodon, 2009; Kes and Swamina than 2006; Brown and Haddad 1995; Mueller 1984; Jacoby 1993; Skoufias 1993). The gendered division of labour within the household is captured by a female-inside/ male-outside dichotomy (Noh and Kim, 2015; Chen, 2005; Entwisle and Henderson, 2000).

In 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 in domestic and care work (World Bank, 2012; Adeyonu, 2012; Bardasi and Wodon, 2009; Kes and Swamina than, 2006; Charmes, 2005). Women's ability to participate in the labor market is therefore constrained by their higher allocation of time to unpaid work (Noh and Kim 2015; Merz & Rathjen, 2009; Bardasi and Wodon, 2009; Kes and Swamina than, 2006). On average, women spend twice as much time on household work as men and four times as much time on childcare (Duflo, 2012).

With regard to Ethiopia, few attempts have been made to test on gender-differentiated time use patterns. Suárez (2010) investigated gender disparities in time allocation, time poverty, and labor allocation across employment sectors in Ethiopia. The result indicated that gender inequality in total work time observed in Ethiopia. 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.

Other empirical research reaffirmed gender-based division of labor and reflects also the inequality in women's and men's total work time and leisure that was already established by early empirical evidence. Some such studies include Quentin et al (2010), Antonopoulos and Memis (2010), and Gammage (2010), Amin and Suran (2008), Ritchie et al (2004), Olivier and Silvia (2010), Blackden and Canagarajah (2003), Ilahi 2000; Sikod(2007).

Human capital (education) is one of the keys to gender-differentiated time allocation. Human capital (education) can be indexed by years of schooling or dummies for literacy to assess how education affects the different components of male and female time. Olivier and Silvia (2010) in their study in Rwanda, identified education as a major cause for gender-differentiated time use patterns. Education is found to

have a significant positive impact upon work for women; education increases market work, and has a slightly larger effect when they have no children under 3.

Agenor (2015) and Vreyer, Philippe, and Roubaud (2013) have used time use survey to explore effect of education on time allocation. Their findings corroborated the already established fact from previous studies (women's education increases equality in the division of domestic work). Women with higher education spend less hours on domestic work than women who did not attend school; the opposite trend is observed for men: the more educated they are, the more they participate in domestic tasks. Thus education effect works more by reducing women's domestic working time than by increasing men's working time.

Another important factor for gender-differentiated time allocation is access to infrastructure. In developing countries infrastructure (such as tap water and electricity) is poor or non-existent. In most settings the burden of provision of these services to the household largely falls on the female members, though there is some evidence that men may also be involved (Dinkelman, 2011; Bardasi and Wodon, 2009; Lawson, 2008; World Bank, FAO and IFAD, 2008; Isha, 2007). A study by Adda et al. (2009) in Kenya and Nankhuni (2004) in Malawi, found that deterioration in the access to water and wood is negatively related with the total time women have to allocate to earning activities and leisure.

Dinkelman (2011) also found that electrification in post-apartheid South Africa increased female labor force participation, for example, because of a shift away from cooking with wood and toward electric stoves. Recent empirical research reaffirmed the strong link between access to basic infrastructure (such as water and energy) and market work that was already established by early empirical evidence. Some such studies include Agenor (2015), Meeks (2014), Devoto et al. (2012) and Lawson (2008).

Childcare time is often indicated as one of barrier for women's to enter in labor market. For biological or more importantly sociological reasons, the care of children is sharply divided along gender lines—it is mostly in the domain of women's work. It is widely believed that the time mothers spend with children is a substitute of their time in income generating activities (Canuto and Silva, 2010; Kalenkoski, Ribar and Stratton, 2008; Stanca et al., 2008).

Economic theory of labor argues that a priori it is difficult to obtain the direction of wage effect on time allocation. This is because income and substitution effects of a wage increase work in opposite directions and in the end the result depends on which portion of his/her labor supply function the individual is located. Most time use studies mention wages as a key driver of female labor supply (Kalenkoski, Ribar and Stratton, 2008; Stanca et al., 2008; Heckman and MaCurdy, 1980). However, Jaumotte (2003) points out that, working for a wage is chosen by women only if earnings at least make up for the lost home production (and the associated costs), implying a higher elasticity of female labor supply to wages.

Studies on time use patterns of households in developing countries also showed a remarkable division of labor based on age, particularly in rural areas (Brauw et al 2008; Zhanget al 2004 and Chen 2004; Mueller 1984). For instance, an intergenerational division of labour exists in rural China with older household members, compared to younger members, providing fewer hours of work and also working in different work categories. For farm work, participation rates peak for men and women, respectively, in the 46-55 age group and 36-45 age group (Brauw et al 2008); for off-farm work, participation rates for men and women are highest for the age groups, respectively, 21 to 25 years and 16 to 20 years (Zhanget al ,2004). In households with preschool children, there is a common pattern of division of labor between the elderly woman and the daughter-in-law, with the latter working outside of the house (undertaking farm work, off-farm work, and self-employment activities) and the former working inside the house (Chen, 2004).

With respect to marital status, a single person has domestic responsibilities for him-/herself alone. When he or she gets married, a two-person household comes into being. The experience of parenthood often implies a crystallization of gender roles, with an increase in female time devoted to housework and childcare, at the expense of paid employment, whereas married men will perform more paid work and will have fewer domestic responsibilities. (Anxo et al. 2007; Lunderg, Rose, 2005 and Blossfeld and Drobnic, 2001).

4.1.2. Developed Countries

Women's labour supply in western countries has increased dramatically during the second half of the twentieth century (Sofer, 2005). However, there is marked gender differences in labor market and household time allocation (Rizavi and Sofer, 2008; Goldschmidt and Pagnossin, 1995).

In the area of general time-use pattern analysis, Allard and Janes (2008) descriptively examined patterns of daily time allocated to various activity purposes, comparing trends in time-use by gender and the age of children in the household. A key finding is that married men employed full-time spend, on average, about an hour more at work on a workday than married working women employed full-time. Women, on the other hand, spend more time on childcare and household activities than men in nuclear family households, though the disparity decreases with the age of the children in the household.

Milkieet al. (2009) also claim that full time employed mothers, on average, spend an additional 1.5 weeks every year on total work than do their employed husbands. The measure of total work includes both market work (paid work time and commuting time) and non-market work (including housework, childcare, and shopping).

According to Becker (1975), human capital (education) constitutes all knowledge and skills that increase an individual's productivity in the labor market. Education is often considered the most important form of human capital. For more highly educated men and women it is appealing to devote relatively more time to paid employment, as the benefits in terms of money and status can be high. Thus more highly educated men and women will be more active in the labour market and will spend less time on household chores.

Many empirical studies have emphasized the importance of education in models of female labor supply. Eckstein and Lifshitz (2011) and Mancini and Pasqua (2010) estimate a dynamic stochastic female labor supply model with discrete choice, and find that changes in education (accounting for a third of the increase in female employment) and wages (explaining about 20 percent) play a large role in explaining female employment.

Theory suggests that (both bargaining and collective model of household decision-making), gender differences in earnings will result in gender differences in housework time. On average, women are paid less than men and so will find time spent on household production less costly than men do (Jaumotte, 2003). A study conducted by Gupta and Stratton (2010), to examine the impact of alternative power measures on individual time use in American and Danish couple households, found that earnings are negatively related to housework time for women and that women's wages are negatively affected by time spent on housework. Results for men suggest little relation, which is perhaps not surprising given that men's labor supply varies little with earnings. However, on average women spend more time on housework than their partners even when their earnings are comparable, indicating that earnings differentials alone cannot explain the entire gender difference in housework time.

Furthermore, tax policy may aggravate gender differences in time allocation. Income taxes are likely to cause households to allocate more time to household production and less time to market production than would be socially optimal. A study conducted by Kabátek, Soest, and Stanca (2014), to investigate the nexuses among the income taxation, labour supply and housework using a discrete choice model for French couples, found that given observed gender differences in earnings, designing tax policies that focus on individual rather than household income would reduce women's tax-distorted incentive to increase their home production time once they are married. Taxes based on individual rather than household earnings will distort incentives less.

According to Krueger (2007) and Stratton (2012), some of the gender difference in housework time has been attributed to differences in preference. Preferences for goods produced in the home and for the activities themselves will affect time allocations. People who place a higher value on home-produced goods will naturally devote more resources to their production—including more time. Preferences also vary by gender. Women are more likely than men to report enjoying cooking, cleaning, gardening, and even laundry and ironing. Men are more likely to report enjoying repair work. Thus, differences in preferences could explain some of the gender difference in reported time

According to Mancini and Pasqua (2010), presence of children and infants are expected to have a negative impact on the number of hours women work for pay. Ekert-Jaffé (2011) estimated the daily time costs of children of varying ages for parents. The study found that the time cost of three or more children is equivalent to a fulltime job. A number of other papers have provided similar broad and general descriptive analyses (see, for example, Jacobs and Gerson, 2001 and Barnett *et al.*, 2009).

4.2. Determinants of Time Poverty

The concept of time poverty was first used by Vickery (1977) in order to identify families with time unavailability which kept them from attaining the U.S. good-being level, due to long working hours. All studies model time poverty as a function of individual/household characteristics, region of residence, and economic/social structural variables.

The evidence from Africa shows that women spend longer hours working with very little time for rest or leisure (Sow, 2010; Fafchamps *et al.*, 2009; Ngome, 2003 and Tibaijuka 1984). Saqib and Arif (2012) used Time Use Survey (TUS) compiled in 2007 for Pakistan to examine determinants of time poverty. Since there are certain women-specific activities that they have to perform irrespective of their employment status, results indicate that women are found to be more time poor than men whether they are employed or not. This additional time burden plays a key role in making them more time poor. In this sense women are doubly disadvantaged i.e they face both income poverty and time poverty.

Likewise, results by Arora and Rada (2014) for Ethiopia, Antonopoulos and Memis (2010) for South Africa, Warner and Campbell (2000) for Tanzania, Koopman 1991 for Southern Cameroon, as good as results by Evers and Walters (2001) for Cameroon show that women are found to be more time poor than men.

Saqib and Arif also found that, the industry in which a worker is employed is a strong correlate of his/her time poverty. Workers engaged in trade, transport and manufacturing sectors are more time poor than those engaged in other sectors including agriculture, service and construction sectors. The monthly income also gives a similar message; the workers in low income groups are more time poor than the workers in high income groups. The results of marital status suggest a positive relationship between time poverty and being married which shows that marriage increases the use of time on committed activities.

Human capital (education) is one of the key factors related to time poverty for both men and women. The empirical results are mixed. While some studies show that being educated reduces the probability of time-poverty (Saqib and Arif, 2012; Burchardt, 2008; Newman, 2001). For instance, Saqib and Arif (2012) and Kalenkoski *et al.* (2008), found evidence of bi-directional causality (feedback effect) between education and time poverty. Increasing education is associated with lower probabilities of being time poor. Others indicated the opposite (Bardasi and Wodon, 2010; Gammage, 2010).

A study in Mozambique by Arora (2015), based on time-use data from a 2013, examined the nature and extent of time-poverty experienced by men and women in peasant households in Mozambique. He found that women are time-poor compared to men mainly due to unequal division of labor within the household, poor infrastructure, and lack of substitutes for unpaid work. He also indicated that the statistical significance of household size in explaining the probability of being time-poor is mainly driven by the female sample. This follows from the fact that women are the homemakers, and an increase in the number of members in the household implies greater burden of household chores.

A study in Guinea-Bissau by Bardasi and Wodon (2009) using Time Use Survey 2002–2003 investigated the existence of gendered time poverty. The result indicates that women are found to be more time poor than men, for women living in rural areas the magnitude increases. Marital status is also associated with variations in the probability of being time poor, but this effect is significant only for women. A similar effect is estimated for divorced women.

Ribeiro and Marinho (2010) use 2009 National Household Sampling Survey to examine the determinants of time poverty in Brazil. The result indicates that women are found to be more time poor than men (both in urban and rural areas) because they allocate more time for house chores. The study also found that an increase of the number of people living in the same household reduces the probability of an individual to be time-poor. Probably as house chores are usually distributed among the members of the household, this lessens their chances of being time-poor. The same result was found by Lawson (2007) for the Sub-Saharan Africa, the Bardasi & Wodon (2006, 2009) results for Guinea-Bissau and the Kalenkoski *et al.* (2008) results for the United States.

A study in Lesotho by Lawson (2008), based on time-use data from a 2002, sought to examine the nature and extent of time-poverty experienced by men and women in peasant households in Mozambique. The main finding is infrastructure provision such as water service and electricity can be very effective, in reducing time poverty. Such variables are perhaps of greater importance for women, than for men.

5. Methodology

5.1. Data and Data Source

This in-depth analysis used CSA time use survey data collected from the field in February 2013. This survey used a two stage stratified random sampling design to select representative sample of 20,280 HHs from 676 EAs. The samples were drawn from the rural and urban areas. A total of 52,262 persons aged 10 years and above were interviewed for the time use section in particular and the survey questionnaires in general. The study also used a 24-hour diary, divided into one-hour slots, as the core instrument to record activities.

5.2. Model Specification: The Gronau–Hamermesh Model of Time Allocation

Generally there are three broad approaches considered in order to investigate determinants of time allocation. These are the Gronau Model, the Becker Model and the Gronau–Hamermesh model. Among the theories, the Gronau–Hamermesh model appears to include both Gronau Model and the Becker Model.

The model used to study the number of chosen activities comes from Gronau and Hamermesh (2001) and is based on Beckerian household production model with the objective of examining what determines the selection of chosen activities. In this context, the problem of consumer's choice can be reduced to a time allocation problem: How many hours have to be worked in order to purchase market goods and how many hours to devote to making basic commodities and consuming them.

We have a household production function that combines time and goods to produce basic commodities or activities. The household utility function U :

$$U = U(Z_1, Z_2, \dots, Z_n) \quad \text{Eq 15}$$

Where Z_i stands for the output:

$$Z_i = f^i(X_i, T_i) \quad \text{Eq 16}$$

Where T_i is the time input and X_i is the goods input. The maximization of utility is subjected to two constraints, a time constraint and income constraint:

A time constraint is given as follows;

$$\bar{T} = \sum_{i=1}^n T_i \quad \text{Eq 17}$$

Where T_i is time input in to i^{th} activity and \bar{T} is the total time available.

Income constraint is also represented as follows: Where p_i is the price of the good i , W stands for wage, L stands for market work hours and V is the non-labor income

$$I = \sum_{i=1}^n p_i X_i = wL + v \quad \text{Eq 18}$$

$$\sum_{i=1}^n \frac{p_i}{w} X_i = L + \frac{v}{w} \quad \text{Eq 19}$$

Whereas,

$$\bar{T} + L = T_0 \quad \text{Eq 20}$$

$$\sum_{i=1}^n T_i + L = T_0 \quad \text{Eq 21}$$

$$L = T_0 - \sum_{i=1}^n T_i \quad \text{Eq 22}$$

Equation 22 is redundant

By substituting equation 22 into equation 20,

$$\sum_{i=1}^n \frac{p_i}{w} X_i + \sum_{i=1}^n T_i = T_0 + \frac{v}{w} \quad \text{Eq 23}$$

The maximization leads to the selection of those activities that fulfill the condition:

$$\lambda = \frac{u_i}{\pi_i} \quad \text{Eq 24}$$

Where $u_i = \partial U / \partial Z_i$ is the marginal utility of activity i and λ the marginal utility of effective time:

$$\bar{T} + L + \frac{v}{w} = \lambda \quad \text{Eq 25}$$

And π_i is the marginal time cost of producing activity i . This cost constitute of the market work time needed to earn the goods used in production time, their relative cost p_i/w_i and the house work time to produce the activity, where p_i is the price of the good i .

$$\pi_i = \left(\frac{p_i}{w} \right) \frac{\partial X_i}{\partial Z_i} + \frac{\partial T_i}{\partial Z_i} \quad \text{Eq 26}$$

It should be noted that in this shadow price equation, both market work time and house work time are derived with respect to the household production function. The activities chosen are those where the reservation price $\pi_i = u_i(0)/\lambda$ is higher than the marginal time cost: $\pi_i^* > \pi_i, i = 1, \dots, m$

Gronau and Hamermesh (2001) contract this model to the traditional explanation of the number of activities, where the variety is explained by the dispersion of preference and incomes. In the household production model the diversity is caused also by differences in time costs.

Gronau and Hamermesh argue that the different investments in human capital directly affect the cost of undertaking the activities. According to them, education can enhance a person's ability to plan, coordinate and streamline tasks and this should also become apparent in household production. Also setup costs play a big part in the switch between activities and the more educated people are better able to reduce the setup costs. This means that the higher the amount of human capital, the lower the marginal time costs $\partial T_i / \partial Z_i$ will be.

The economic variables in Gronau and Hamermesh's model are the wage rate and non-labor income. The higher the wage rate, the costlier time is and thus more activities are pursued in a given time. Interestingly in their model, an increase in non-labor income V increases the effective time constraint and has the traditional income effect on variety. This is in contrast to the standard household production theory, as advanced for example by Gronau (1977), where non-labor income does not have an effect

5.3. The Econometric Model

Gender-differentiated time allocation between market and non-market work is affected by many factors. The most widely mentioned are household composition (age and gender composition of household members), sex of the respondent, marital status, education level, household size, wages, income level, number of infants (0-5 years) in the household, number of children (6-14 years) in the household, and regional and geographic factors (area of residence), including ease of access to water and fuel, availability of infrastructure, and distance to key economic and social services such as schools, health centers, financial institutions, and markets. Some studies also include social and cultural norms (Noh and Kim, 2015; Adeyonu, 2012; Bardasi and Wodon, 2009).

In order to identify the relative importance of these determinants of gender differentiated time allocation, a tobit econometric model has been specified:

$$T_{ijk} = \beta_0 + \beta_1 \text{Age}_{ij} + \beta_2 \text{Sex}_{ij} + \beta_3 \text{NoAct}_{ij} + \beta_4 \text{Income}_{ij} + \beta_5 \text{IndType}_{ij} + \beta_6 \text{Ma}_{ij} \\ + \beta_7 \text{CH}_{ij} + \beta_8 \text{INF}_{ij} + \beta_9 \text{AREA}_{ij} + \beta_{10} \text{Access}_{ij} + \beta_{11} \text{Edu}_{ij} + \beta_{12} \text{HHsize}_{ij} + \delta_{ij}$$

Where:

T_{ijk} is time allocation by: $i = 1, 2, \dots, n$ sampled respondents and $j = w, m, b, g$ sections of the population (women, men, boys and girls respectively) for $k = \text{MW, HW, CS, PC, LR, UPW and PW}$ activity types (Market Work, Home Work, Caregiving Service, Personal Care, Leisure and Paid Work and Unpaid Work respectively).

β_0 is the intercept,

Age = age of the respondent

Sex = sex of the respondent

NoAct = Daily number of activities

Income = income of the respondent

IndType= type of industry the respondent is employed

Ma= marital status

CH= number of children (6-14 years) in the household

INF= number of infants (0-5 years) in the household

Area= area of the residence

Access= access to basic infrastructure

Edu= education level

HHsize= household size

However, since not all population is engaged in all types of work for the day of reference, the dependent variable takes the value zero for some observation. At this point in many studies where hours worked are analysed it is said that the dependent variable is left-censored at value zero. In this case, OLS model will yield to inconsistent estimates. The more accurately approach to use in case of censored dependent variable is the Tobit model. According to the Tobit model (Tobin 1958) the dependent variable is defined as follows:

$$T_{ij}^* = X_{ij}'\beta + \dot{\epsilon}_{ij}$$

Where: T_{ij} is Time allocation and X_{ij} vector of determinants, $\dot{\epsilon}_{ij}$ is the error term normally distributed with mean 0 and a constant variance: $\dot{\epsilon}_{ij} \sim N(0, \sigma^2)$ and the observed T_{ij} is defined as:

$$T_{ij} = \begin{cases} T_{ij}^* & \text{if } T_{ij}^* > 0 \\ 0 & \text{if } T_{ij}^* \leq 0 \end{cases}$$

However, it is important to look at the limitations of the Tobit model. As Maddala (2001) explains, this model above is actually designed for the situations where the left hand side variable can take negative values but these values are not observable which is the reason why is called a censored variable. In the case of hours worked, takes values of zero not because of censoring but because of decision of individuals not to participate in the labour market or in the non-market activities. Using the standard Tobit model for hours worked can yield inconsistent estimated parameters. Therefore, Maddala recommends to use models where the decision making process of individuals is considered. Following this idea the appropriate model that should be used is the Heckman's Two-Step model (Heckman, 1978). It consists of two steps, as the name suggest. The first one is a probit regression of selectivity by MLE using all observations and the second step consists of an OLS regression using only the positive values of the dependent variable. The estimators from this two-step procedure are consistent and asymptotically normal.

Selection equation:

$$Z_i^* = \gamma'W_i + \mu_i$$

Where:

$$Z_i = \begin{cases} 1 & \text{if } Z_i^* > 0 \\ 0 & \text{if } Z_i^* \leq 0 \end{cases}$$

Structural equation:

$$y_i^* = X_i\beta + \dot{\eta}_i$$

Where

$$y_i = y_i^*, Z_i = 1 \text{ if } Z_i^* > 0$$

$$y_i \text{ not observed, } Z_i = 0 \text{ if } Z_i^* \leq 0$$

Stochastic specification:

$$\mu_i \sim N(0,1)$$

$$\dot{\eta}_i \sim N(0, \sigma^2)$$

$$\text{corr}(\mu_i, \dot{\eta}_i) = \rho$$

Likelihood function corresponding to the selection equation:

$$\prod_{Z_i=0} [1 - \Phi(W_i'\gamma)] \prod_{Z_i=1} \left[\Phi\left(\frac{W_i'\gamma + (\rho/\sigma_\delta)(y_i - X_i'\beta)}{\sqrt{1-\rho^2}}\right) \frac{1}{\sigma_\delta} \phi\left(\frac{y_i - X_i'\beta}{\sigma_\delta}\right) \right]$$

In order to identify and analyze time poverty correlates as good as their marginal effects, a probit model is used to explain the probability of being time poor as a function of personal, household and area variables specified as follows:

$$\Pr(Y_{ij} = 1 / X_{ij}) = \Phi(X_{ij}'\beta)$$

Where:

Y_{ij} assume 1 if the time allocated T_{ij} is above the minimum threshold Z - time poverty line, zero otherwise

X_{ij} represents demographic variables (e.g. age, sex, and marital status), the educational qualifications, religion, the consumption quintile of the household, the number of infants (aged 0–5), children (aged 6–14), adults (aged 15–64) and senior people (aged over 65), dummy variables for the presence of disabled people, and geographical dummies for rural/urban areas. While undertaking all the regressions outlined above, the sampling weights of the time use survey has been considered.

6. Analysis of Time Poverty

6.1. Introduction

In this study, we attempt to examine the characteristics of time-poor people through analyzing their socioeconomic features. In so doing, it is quite essential to highlight the three concepts of time poverty: head count index, poverty gap and squared poverty gap or time poverty severity. The headcount index is the proportion of the population/individuals that are time poor, that is, the proportion of the population that works a number of hours that is above a certain time poverty line (Coudouel *et al.*, 2002). The concept should be understood in the sense that some individuals do not have enough time for rest and leisure after taking into account the time they spend working, in the primary, secondary, job market and/or house work.

On the other hand, time poverty gap represents the mean distance separating the population from the time poverty line. This measures the time deficit of the entire population, in effect, the amount of time that would be needed to shift all individuals who are time poor below a given time poverty line through perfectly targeted time transfers or sharing the burdens and improving working transfers (World Bank, 2006). The squared time poverty gap takes the square of that distance into account. It takes into account the inequality among the time poor by giving more weight to those who have extra-long working hours. In other words, it measures how severe the time poverty is within the time-poor individuals.

It is essential to make some concepts clear and put working definitions for this analysis. In this study, all persons aged from 10 to 17 are considered as boys or girls, while adults are defined as persons aged 18 years and above. Time poverty is a new and emerging concept while being time-poor has significant impact on the socio-economic endeavors of persons. Constructing time poverty line is not an easy task without established empirical and theoretical findings. As a result, the literature gives two options by providing lower and higher thresholds. In the words of Riberiro and Marinho (2012) these two poverty lines are inferior and superior thresholds, respectively. Following Badasi and Wodon(2006), we define lower threshold poverty line as a mean work time in minutes plus a quarter of mean leisure time and thus equal to 482 minutes per day while the higher threshold poverty line as mean work time in minutes plus half of the mean leisure time and thus equal to 561 minutes per day. Constructing lower and higher threshold time poverty lines enables to identify individuals who belong to the lower and upper work time distribution i.e. those who work in excess be it at housework or paid/unpaid work.

The following poverty indices are calculated using these threshold poverty lines. In the analysis of results, lp_0 , lp_1 and lp_2 refer to the lower threshold headcount time poverty index, time poverty gap index and time poverty severity index, respectively while hp_0 , hp_1 and hp_2 represent the higher threshold headcount time poverty index, time poverty gap index and time poverty severity index, respectively.

6.2. Analysis of the Time Poverty Indicators

In this section, we examine the time poverty of individuals with different geographic and demographic characteristics. Various socioeconomic and demographic features are used to analyse the time-poor people. Such features *inter alia* include region, gender, location, level of schooling and religion. These characteristics of individuals are also considered in order to determine the demographic and geographic determinants of time poverty in Ethiopia.

6.2.1. Time Poverty by Region

Table 6-1 shows the proportion of people above the poverty line which are called time poor by region, based on the lower and higher threshold poverty lines. It also shows the time poverty gap, as well as time poverty severity. Using the lower time poverty line as a reference, about 43.4% of the surveyed individuals are time poor. In terms of regional variation, the highest shares of time poor are observed in Addis Ababa and Somali at 50.7% and 49.6%, respectively. Gambela witnessed the lowest in terms of the share time poor individuals at 32.2%. Using the higher poverty line as a reference, about 29.8% of individuals are time poor. Looking at the time poverty gap and severity, the average time poverty gap is 10.54 minutes per day to fill the time gap of those persons above the time poverty line taking the lower time poverty line and this however decreases to 4.51 minutes per day if we take the higher time poverty line. With the same analogy, time poverty severity index is 4.5 taking the lower time poverty line while it is at 1.5 in the upper time poverty line. Note that the average time poverty is still considerably high as measured by the time poverty headcount index. There are various socioeconomic and demographic factors which determine the time use of people.

Table 6-1: Lower and Higher Threshold Time Poverty Index by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 43.12 | 10.74 | 4.94 | 31.97 | 4.83 | 1.71 |
| Afar | 41.43 | 8.48 | 3.01 | 25.27 | 3.11 | 0.82 |
| Amhara | 45.46 | 11.70 | 5.17 | 32.56 | 5.18 | 1.71 |
| Oromia | 41.91 | 9.97 | 4.15 | 27.57 | 4.14 | 1.32 |
| Somalie | 49.57 | 11.33 | 4.33 | 33.15 | 4.43 | 1.26 |
| Benishangul-Gumuz | 39.19 | 8.32 | 3.61 | 25.65 | 3.45 | 1.22 |
| SNNPR | 42.08 | 9.68 | 3.94 | 27.80 | 4.00 | 1.22 |
| Gambela | 32.20 | 5.65 | 2.39 | 22.14 | 2.18 | 0.81 |
| Harari | 34.22 | 8.46 | 4.46 | 22.94 | 3.96 | 1.75 |
| Addis Ababa | 50.65 | 14.03 | 7.23 | 39.17 | 6.78 | 2.73 |
| Dire Dawa | 45.44 | 10.11 | 4.75 | 33.82 | 4.54 | 1.69 |
| Total | 43.41 | 10.54 | 4.52 | 29.75 | 4.51 | 1.47 |

Source: Based on time use survey

6.2.2. Time Poverty by Gender and Region

Gender is among the factors which are expected to have a significant impact in the time use of persons depending on the socioeconomic strata of the society. Table 6-2 presents gendered time poverty by regions. Using the lower time poverty line, at national level 43.3% of males are time poor. Addis Ababa leads by the number of time poor male individuals at 57.9% while Harari is the least at 34.22%. Looking at the time poverty of males using the upper time poverty, about 30.2% of males are time poor. Addis Ababa still constitutes the highest time poor at 46.1% while Harrari witnesses the least at 24.5%. From this, it can be noted that constructing two-time poverty lines helps to know the difference among regions when we employ the two poverty lines.

Focusing on the time poor females, at national level 43.5% and 29.2% of females are time poor under the lower and higher time poverty lines, respectively. Comparing regions, Somalia is the home for the time poor females at 52.2% while Harrari has the least time poor females at 33.8% in the lower timer poverty line. With reference to the higher poverty line, 29.2% of females are time poor.

Table 6-2: Lower and Higher Threshold Time Poverty Index for Male and female by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|--------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Male | | | | | | |
| Tigray | 46.88 | 11.03 | 5.38 | 35.43 | 4.95 | 1.99 |
| Afar | 48.10 | 10.17 | 3.78 | 30.89 | 3.79 | 1.09 |
| Amhara | 48.61 | 12.55 | 5.69 | 35.96 | 5.58 | 1.94 |
| Oromia | 40.23 | 9.44 | 4.27 | 26.51 | 4.04 | 1.49 |
| Somalie | 46.84 | 9.55 | 3.68 | 32.17 | 3.57 | 1.11 |
| Benishangul-Gumuz | 41.53 | 8.73 | 4.36 | 30.01 | 3.95 | 1.65 |
| SNNPR | 37.39 | 7.81 | 3.37 | 24.86 | 3.24 | 1.13 |
| Gambela | 37.57 | 6.53 | 3.37 | 29.47 | 2.80 | 1.34 |
| Harari | 34.67 | 9.27 | 5.86 | 24.52 | 4.76 | 2.57 |
| Addis Ababa | 57.86 | 16.66 | 9.04 | 46.07 | 8.25 | 3.54 |
| Dire Dawa | 49.41 | 9.43 | 4.85 | 37.98 | 4.28 | 1.88 |
| Total | 43.32 | 10.30 | 4.70 | 30.33 | 4.49 | 1.64 |
| Female | | | | | | |
| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Tigray | 39.72 | 10.50 | 4.57 | 28.84 | 4.72 | 1.48 |
| Afar | 35.41 | 7.02 | 2.35 | 20.21 | 2.52 | 0.58 |
| Amhara | 42.34 | 10.90 | 4.67 | 29.20 | 4.81 | 1.50 |
| Oromia | 43.55 | 10.48 | 4.03 | 28.60 | 4.24 | 1.16 |
| Somalie | 52.22 | 12.92 | 4.90 | 34.10 | 5.20 | 1.39 |
| Benishangul-Gumuz | 36.99 | 7.96 | 2.97 | 21.54 | 3.02 | 0.86 |
| SNNPR | 46.42 | 11.33 | 4.44 | 30.52 | 4.67 | 1.30 |
| Gambela | 26.88 | 4.89 | 1.55 | 14.87 | 1.65 | 0.36 |
| Harari | 33.81 | 7.74 | 3.23 | 21.47 | 3.25 | 1.03 |
| Addis Ababa | 43.82 | 11.74 | 5.65 | 32.64 | 5.50 | 2.02 |
| Dire Dawa | 41.83 | 10.63 | 4.68 | 30.03 | 4.75 | 1.54 |
| Total | 43.49 | 10.76 | 4.35 | 29.18 | 4.53 | 1.32 |

Source: Based on time use survey

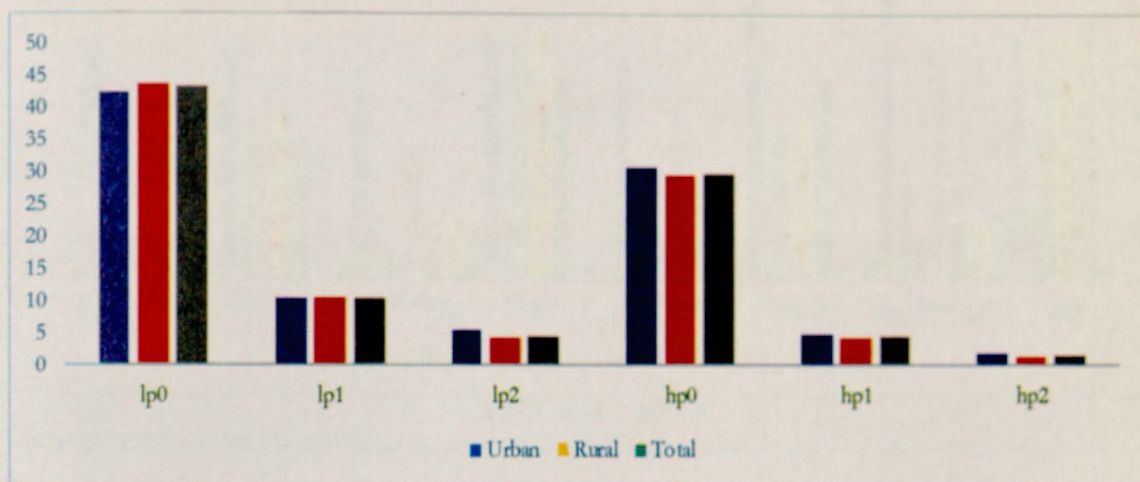
It is essential to compare the time poverty of male and female individuals because of its decisive policy implication. In terms of the headcount index of time poverty, there is no significance difference between males and females at 43.3% and 43.5%, respectively. With the same token, the average time poverty gap is also nearly the same at 10.30 minutes and 10.76 minutes per day for males and females, respectively. Looking at the severity of the time poverty, it seems that severity is slightly higher for males than females at 4.70 and 4.35, respectively. In reference to the higher poverty line, headcount time poverty index and time poverty severity are higher for males than females while time poverty gap is higher for females. This will central to further use rigors methodology and determine the significance of gender in the determining time poverty.

6.2.3. Time Poverty by Location and Gender

The other factor which would significantly affect time poverty is the location where people reside. In this case location refers the residential area of the surveyed people which is either rural or urban. The location of people could demand to work hard and spend more time on working either in the formal or informal sector. House work and others types of jobs could also be demanding. Figure 6-1 shows the time poverty indicators of the surveyed people by disaggregating into urban and rural residents. The incidence of time poverty is higher in rural areas at 43.7% under the lower poverty threshold line, while poverty gap and

severity are higher in urban areas. Using the higher time poverty threshold as a reference, urban dwellers are more time poor than rural people.

Figure 6-1: Lower and Higher Threshold Time Poverty Index by Urban/Rural



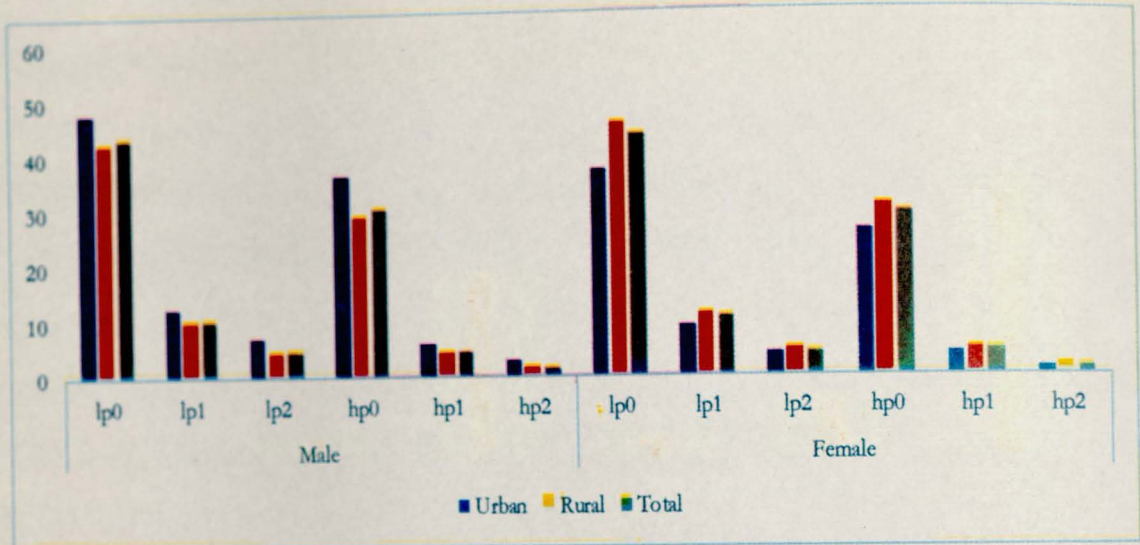
Source: Based on time use survey

Table 6-3 shows only the proportion of time poor people in urban and rural Ethiopia. Living in rural and urban areas may not give equal time freedom for all people. In a country like Ethiopia, rural women may not have the time freedom unlike the urban as there is a poorly developed infrastructure like water, road, transport and the likes. On the other hand, women in urban areas would be expected to work hard in the formal sector to meet the living standards of the urban life. Figure 6-2 presents the incidence of time poverty, time poverty gap and severity disaggregated by gender.

Urban men are time poorer than rural men at 47.8% and 42.1%, respectively, and the time poverty gap and severity are higher for urban men than rural men. The same is true for the urban men and rural men using the higher threshold time poverty as a reference. The three indicators of time poverty are slightly higher for urban men than rural men. This could be due to the fact urban men are expected to do more to satisfy the living demands of the urban life. Rural men would also take religious holidays as opportunity for leisure time.

Comparing the time poverty of rural and urban women, rural women are time poorer (45.3%) than urban women (37.2%). The time poverty gap is also higher for rural women. Only time poverty severity is higher for urban women while gauging time poverty with higher time poverty threshold line. As mentioned earlier, this could attribute to a relatively developed infrastructure of the urban women. In general, it seems consistent with the findings that rural women are time poor compared with urban women.

Figure 6-2: Lower and Higher Threshold Time Poverty Index for Male and female by Urban/Rural



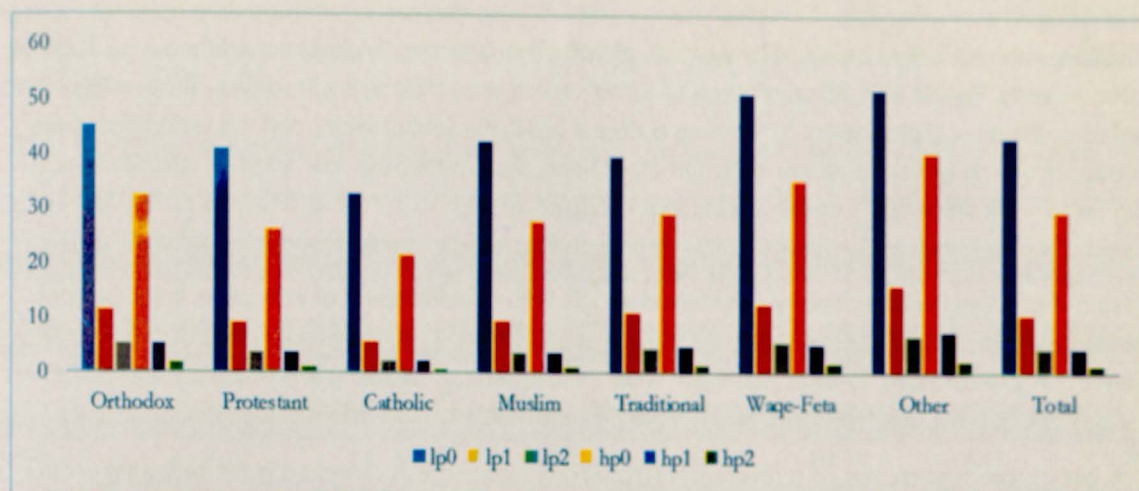
Source: Based on time use survey

6.2.4. Time Poverty by Religion and Gender

Religion is also an important factor which determines the time use of people. Religion can be a factor in determining time poverty particularly in countries like Ethiopia where there is a diversified and culture and subculture. Different religion organizations have got specific dogmas and commandments which would affect the time use of their followers. Figure 6-3 presents the incidence, gap and severity of time poverty for different religion followers. From the religions identified WaqeFeta followers are more time poor (51.2%) than others while catholic followers are relatively less time poor (32.7%). Above all unidentified religion followers are more time poor than others at 52.1%. Similar trends are witnessed under the higher time poverty threshold index.

Looking at other religions like Muslim and Orthodox which constitute major followers in the country's population, they are still high at 42.5% and 45.0%, respectively. Protestant (40.8%) and traditional (39.6%) religion followers are also relatively time poor as measured by headcount time poverty index. It appears that religious persons tend to be time poor due to different reasons. Among these spending time on religious services would be another factor which lessens the leisure time of those people.

Figure 6-3: Lower and Higher Threshold Time Poverty Index by Religion



Source: Based on time use survey

It is also crucial to analyse the time poverty of people with different religions disaggregated by gender. In this regard, it is quite good to compare men and women taking into account their religion. Table 6.3 presents this comparison using the lower and upper time poverty thresholds. Men orthodox (47.5%) seem more time poor than women orthodox (42.6%) while women Protestants (42.5%) are more time poor than men Protestants (38.9%). In Muslim and catholic religions, females are time poorer than males while in traditional and Waqefeta, males are time poorer than females. Besides, time poverty gap is the highest under men traditional (13.28 minutes per day) and least under men catholic (4.17 minutes per day).

Table 6-3: Lower and Higher Threshold Time Poverty Index for Male and female by religion

| Male | | | | | | |
|--------------|--------------|--------------|-------------|--------------|-------------|-------------|
| Religion | lp0 | lp1 | lp2 | hp0 | hp1 | hp2 |
| Orthodox | 47.48 | 12.24 | 5.84 | 35.14 | 5.56 | 2.09 |
| Protestant | 38.85 | 8.51 | 3.74 | 25.74 | 3.57 | 1.28 |
| Catholic | 26.44 | 4.17 | 2.05 | 16.58 | 1.55 | 0.82 |
| Muslim | 39.30 | 8.27 | 3.48 | 25.20 | 3.32 | 1.15 |
| Traditional | 42.57 | 13.28 | 5.35 | 35.94 | 6.38 | 1.47 |
| Waqefeta | 51.80 | 12.73 | 5.32 | 37.02 | 5.37 | 1.68 |
| Other | 49.26 | 11.16 | 4.08 | 33.69 | 4.58 | 1.06 |
| Total | 43.32 | 10.30 | 4.70 | 30.33 | 4.49 | 1.64 |
| Female | | | | | | |
| Orthodox | 42.64 | 10.98 | 4.71 | 29.54 | 4.84 | 1.51 |
| Protestant | 42.51 | 9.99 | 3.75 | 26.90 | 3.96 | 1.06 |
| Catholic | 38.78 | 7.29 | 2.27 | 26.15 | 2.52 | 0.47 |
| Muslim | 45.62 | 10.90 | 4.16 | 30.19 | 4.39 | 1.19 |
| Traditional | 35.89 | 8.70 | 3.37 | 20.73 | 3.48 | 0.99 |
| Waqefeta | 50.50 | 12.82 | 5.66 | 33.51 | 5.32 | 1.94 |
| Other | 54.84 | 20.12 | 9.24 | 47.31 | 10.14 | 2.98 |
| Total | 43.49 | 10.76 | 4.35 | 29.18 | 4.53 | 1.32 |

Source: Based on time use survey

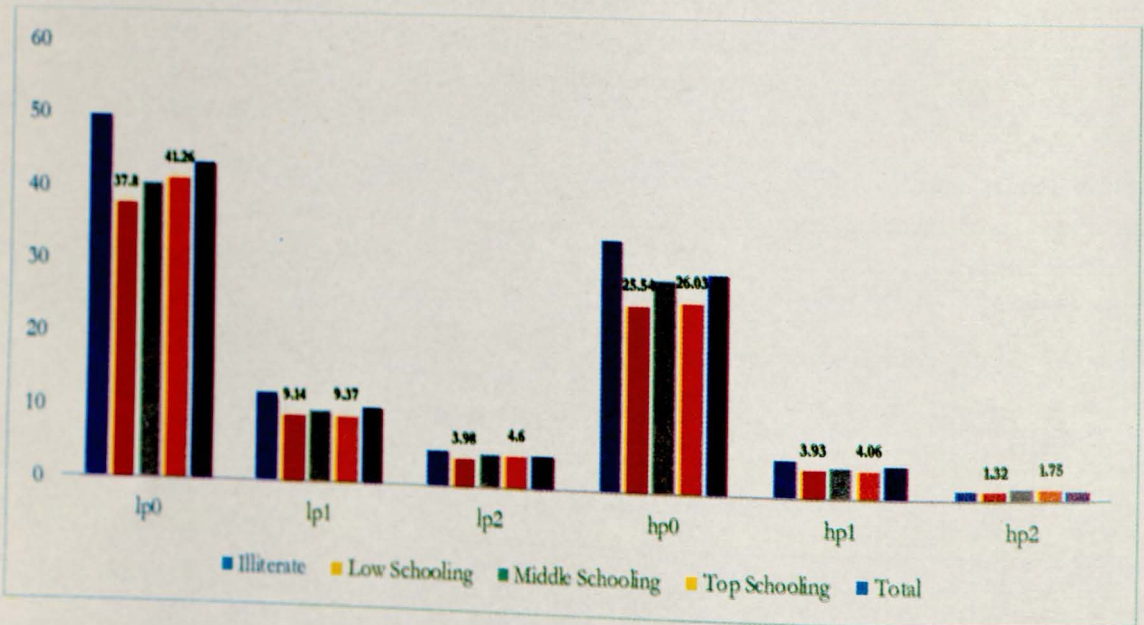
6.2.5. Time Poverty by Education Level and Gender

Education, which is usually explained by the level of schooling, is among the important determining factor of time poverty. People with different levels of schooling can have different leisure time. Those with high level schooling have a probability of securing a decent job in the formal sector and this would give them the opportunity to get more leisure time. On other hand, those who have low level of schooling could struggle to work more hours as the income would not be enough to pursue a decent life. The level of schooling is expected to affect time poverty of men and women by providing more opportunities.

Figure 6-4 presents the time poverty of surveyed people with different level of education. It can be seen that illiterate people are the highest time poor (49.7%) of all education levels. The lowest time poverty is observed in low schooling level of education while middle and top schooling are relatively higher. Both time poverty gap and severity seem quite similar to that of the incidence of time poverty.

Using higher time poverty line as a reference, time poverty incidence is observed in the following order. Illiterate, middle schooling, top schooling and low schooling have 34.1%, 28.9%, 26.0% and 25.5%-time poverty levels, respectively. While poverty gaps take the same trend, poverty severity is relatively higher in top schooling and middle schooling at 1.75 and 1.65, respectively. This in general shows that level of schooling is among the socioeconomic factors determining time poverty.

Figure 6-4: Lower and Higher Threshold Time Poverty Index by Level of Schooling



Source: Based on time use survey

It is quite essential to go further and see the time poverty by level of education/schooling disaggregate by gender (male and female). This creates an opportunity to compare the difference and similarity between male and female at same level of schooling such as illiterate women and men, women and men with low schooling, middle of schooling and top schooling.

Table 6-4 presents the time poverty indicators comparing male and female at different levels of schooling. To start with, illiterate men are slightly time poorer than illiterate women and the same is true for women and men with low and middle schooling. In top schooling, time poor women are higher compared with men. Comparing the time poverty gap between women and men, the poverty gap is higher for illiterate women

at 12.52 minutes per day while the least is in middle school women at 8.38 minutes per day. Time poverty gap is higher for both illiterate woman and men. The time poverty severity is higher for men than women. This severity is the highest for middle schooling men (5.5) and the lowest for middle schooling women (3.5). The same trend is witnessed under the upper poverty line.

Table 6-4: Lower and Higher Threshold Time Poverty Index for Male and female by Level of Schooling

| Male | | | | | | |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Illiterate | 49.70 | 11.55 | 4.87 | 34.32 | 4.80 | 1.58 |
| Low Schooling | 38.42 | 9.35 | 4.30 | 26.89 | 4.10 | 1.50 |
| Middle Schooling | 44.61 | 10.83 | 5.49 | 32.52 | 5.04 | 2.07 |
| Top Schooling | 40.94 | 9.02 | 4.36 | 26.79 | 3.94 | 1.62 |
| Total | 43.32 | 10.30 | 4.70 | 30.33 | 4.49 | 1.64 |
| Female | | | | | | |
| Illiterate | 49.62 | 12.52 | 5.00 | 33.99 | 5.26 | 1.49 |
| Low Schooling | 36.95 | 8.87 | 3.55 | 23.67 | 3.69 | 1.08 |
| Middle Schooling | 34.88 | 8.38 | 3.54 | 23.96 | 3.66 | 1.12 |
| Top Schooling | 41.82 | 9.96 | 5.02 | 24.66 | 4.25 | 1.96 |
| Total | 43.49 | 10.76 | 4.35 | 29.18 | 4.53 | 1.32 |

Source: Based on time use survey

6.3. Analysis of Time Poverty of Adults

In this section, efforts are made to assess the time poverty of adults who are 18 years and above. Thus, it is important to analyze the time poverty of adults by constructing a time poverty line which is specific to them. Therefore, the following time poverty indices are calculated based on lower and higher thresholds of time poverty line for adults in minutes. The lower threshold time poverty line for adults is calculated as the mean time worked by an adult plus a quarter of adults' leisure time and this is set to be equal to 505 minutes per day. The higher threshold time poverty line for adults is calculated as the mean time worked by an adult plus half of adults' leisure time which is 584 minutes per day.

6.3.1. Time Poverty for Adult Males by Region

The time use of adult males would be different from others. This leads us to further see the time poverty of adult people in the country by constructing specific poverty line with lower and higher threshold scenarios. Table 6-5 presents the poverty incidence, gap and severity of adult men by region. About 32.44% and 21.39% of adult men are time poor under the lower and higher threshold poverty line, respectively. Average time poverty gap is 7.05 minutes per day and 2.94 minutes per day while time poverty severity is 2.84 and 0.94 under the lower and higher poverty line, respectively. Looking at the regions, Addis Ababa is the home for time poor adults (42.09%) while Gambela is the least time poor adults at 21.75% of all the regions. Using the higher poverty line a reference, close to 31.36% of adults are time poor in Addis Ababa and only 14.60% of adults are time poor in Gambela. In terms of time poverty gap and severity, still Addis Ababa is the highest while Gambela is the least in both lower and higher poverty threshold lines. Adult men in Addis Ababa are time poorer due to the demanding life in the capital. Men in the city are expected to work hard for their family as head of the household. Gambela also recorded the least time poor adult men; this would be attributed to the socio economic structure of the community in

which much of the work is undertaken by women. It is thus very interesting to see the time poverty of married men.

Table 6-5: Lower and Higher Threshold Time Poverty Index for Adult Men by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 32.16 | 7.14 | 3.13 | 22.87 | 3.15 | 1.11 |
| Afar | 28.13 | 5.04 | 1.68 | 15.97 | 1.77 | 0.47 |
| Amhara | 34.49 | 7.87 | 3.24 | 23.89 | 3.40 | 1.07 |
| Oromia | 30.89 | 6.57 | 2.58 | 19.31 | 2.66 | 0.84 |
| Somali | 33.74 | 6.90 | 2.49 | 21.38 | 2.65 | 0.74 |
| Benishangul-Gumuz | 29.24 | 5.68 | 2.33 | 18.79 | 2.31 | 0.80 |
| SNNPR | 31.33 | 6.42 | 2.42 | 20.14 | 2.56 | 0.75 |
| Gambela | 21.75 | 3.31 | 1.36 | 14.60 | 1.18 | 0.50 |
| Harari | 25.75 | 6.25 | 3.19 | 16.75 | 2.96 | 1.28 |
| Addis Ababa | 42.09 | 10.65 | 5.09 | 31.36 | 4.99 | 1.92 |
| Dire Dawa | 32.56 | 6.86 | 3.06 | 23.49 | 3.05 | 1.10 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |

Source: Based on time use survey

Table 6-6 shows the incidence, gap and severity of time poverty of adult married men under the lower and higher poverty lines. As can be seen, about 43.11% and 28.74% of married men are time poor in the lower and higher time poverty lines, respectively. Poverty gap is 9.34 minutes per day and 3.99 minutes per day for the lower and higher time poverty and time poverty severity is 4.08 and 1.47, respectively. This in general gives a highlight that adult married men are time poorer than adult men. Similar trends in time poverty levels are observed across regions. Addis Ababa is the highest in which 55.99% adult married men are time poor while Gambela is the lowest where 31.39% of married men are time poor under the lower time poverty. In the higher poverty line, 42.82% of adult married men in Addis Ababa and 21.38% of adult married men in Gambela are time poor.

In terms poverty gap and severity, adult married men in Addis Ababa takes the lead under the lower poverty line at 16.23 minutes and 8.89, respectively. Under the higher poverty line still Addis Ababa is the home for a large proportion of time poor adult men in both poverty gap and severity, while Gambela and Afar are the least in poverty gap and severity, respectively. As indicated above, this gives us a hint that, on the average, adult married men are time poor than adults in general. One can list several reasons for this which *inter alia* includes housework and working hard to meet the families demand. When the number of children increases for married men, leisure time would decrease to take care and other economic reasons. The time poverty level in Addis Ababa is also an indicator that adult married men in urban area are time poorer than those in rural areas.

Table 6-6: Lower and Higher Threshold Time Poverty Index for adult married men by region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 47.58 | 10.32 | 5.22 | 35.20 | 4.66 | 2.11 |
| Afar | 42.40 | 7.87 | 2.92 | 24.53 | 2.94 | 0.93 |
| Amhara | 49.79 | 11.18 | 4.53 | 34.83 | 4.71 | 1.49 |
| Oromia | 39.65 | 8.64 | 3.95 | 24.71 | 3.70 | 1.49 |
| Somalie | 39.76 | 7.51 | 3.04 | 24.46 | 2.89 | 1.06 |
| Benishangul-Gumuz | 39.01 | 8.10 | 3.96 | 27.49 | 3.63 | 1.57 |
| SNNPR | 37.85 | 7.14 | 2.73 | 24.60 | 2.85 | 0.86 |
| Gambela | 31.39 | 5.26 | 2.99 | 21.38 | 2.11 | 1.37 |
| Harari | 34.83 | 9.65 | 5.84 | 23.18 | 5.11 | 2.58 |
| Addis Ababa | 55.99 | 16.23 | 8.89 | 42.82 | 8.14 | 3.69 |
| Dire Dawa | 41.68 | 8.24 | 4.15 | 29.69 | 3.67 | 1.68 |
| Total | 43.11 | 9.34 | 4.08 | 28.74 | 3.99 | 1.47 |

Source: Based on time use survey

6.3.2. Time Poverty for Adult Females

We have discussed that there is a difference in the time poverty of males and females with different geographic characteristics. Here, it is useful to estimate the time poverty of adult females and compare with adult married women. Table 6-7 shows the poverty indicators for adult females in different regions in both lower and higher poverty threshold lines. Hence, close to 32.44% and 21.39% of adult women are time poor in lower and higher poverty lines, respectively. Time poverty gap is 7.05 minutes per day and 2.94 per day under the lower and higher poverty lines whereas severity is 2.84 under lower poverty line and 0.94 under higher poverty line.

In terms of regional variation, adult females in Addis Ababa are time poorer at 42.09% while Gambela has got the lowest time poor adult women in the country (at 21.75%). Looking at the poverty gap and severity for adult females across regions, Addis Ababa is the highest at 10.65 minutes per day and 5.09, respectively. The least time poverty gap and severity is observed in Gambela at 3.31 minutes per day and 1.36, respectively.

Table 6-7: Lower and Higher Threshold Time Poverty Index for Adult Female by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 32.16 | 7.14 | 3.13 | 22.87 | 3.15 | 1.11 |
| Afar | 28.13 | 5.04 | 1.68 | 15.97 | 1.77 | 0.47 |
| Amhara | 34.49 | 7.87 | 3.24 | 23.89 | 3.40 | 1.07 |
| Oromia | 30.89 | 6.57 | 2.58 | 19.31 | 2.66 | 0.84 |
| Somalie | 33.74 | 6.90 | 2.49 | 21.38 | 2.65 | 0.74 |
| Benishangul-Gumuz | 29.24 | 5.68 | 2.33 | 18.79 | 2.31 | 0.80 |
| SNNPR | 31.33 | 6.42 | 2.42 | 20.14 | 2.56 | 0.75 |
| Gambela | 21.75 | 3.31 | 1.36 | 14.60 | 1.18 | 0.50 |
| Harari | 25.75 | 6.25 | 3.19 | 16.75 | 2.96 | 1.28 |
| Addis Ababa | 42.09 | 10.65 | 5.09 | 31.36 | 4.99 | 1.92 |
| Dire Dawa | 32.56 | 6.86 | 3.06 | 23.49 | 3.05 | 1.10 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |

Source: Based on time use survey

It will be useful to see the time poverty levels of married women for any policy implications. About 44.42% of married women are time poor under the lower time poverty line while 28.67% married women

are time poorer in the higher poverty line (Table 6-8). The poverty gap is 10.06 minutes per day while the poverty severity is 3.73. With the same token, poverty gap and severity under the higher poverty line are 4.10 minutes per day and 1.11, respectively. Comparing regions, the highest time poor adult married women are in Somali at 48.40% while the lowest are in Gambela at 23.42%. Time poverty gap is also the highest in Somali and the least in Gambela while poverty severity is the highest in Addis Ababa and the least is in Gambela. A similar trend is observed in the higher poverty line except there is a minimal difference across these regions.

From the above discussion, three remarks can be made. The first is there is no basic difference in time poverty between adult male and female. The second is that there is a tendency of being time poor for married adults than others. Third, married women are time poorer than married men.

Table 6-8: Lower and Higher Threshold Time Poverty Index for married women by region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 40.07 | 9.41 | 3.78 | 27.66 | 4.09 | 1.21 |
| Afar | 29.73 | 5.25 | 1.61 | 15.34 | 1.75 | 0.40 |
| Amhara | 44.83 | 10.82 | 4.28 | 30.35 | 4.67 | 1.35 |
| Oromia | 44.42 | 9.69 | 3.43 | 27.91 | 3.81 | 0.97 |
| Somali | 48.40 | 10.98 | 3.84 | 30.52 | 4.31 | 1.06 |
| Benishangul-Gumuz | 36.13 | 7.12 | 2.46 | 19.85 | 2.61 | 0.71 |
| SNNPR | 47.97 | 10.57 | 3.73 | 30.09 | 4.13 | 1.05 |
| Gambela | 23.42 | 3.72 | 1.02 | 13.52 | 1.10 | 0.21 |
| Harari | 32.32 | 7.41 | 2.98 | 20.85 | 3.14 | 0.97 |
| Addis Ababa | 40.69 | 10.35 | 4.61 | 28.70 | 4.71 | 1.64 |
| Dire Dawa | 42.56 | 10.11 | 3.94 | 30.36 | 4.37 | 1.21 |
| Total | 44.42 | 10.06 | 3.73 | 28.67 | 4.10 | 1.11 |

Source: Based on time use survey

6.3.3. Time Poverty for Adults by Location

6.3.3.1. Time Poverty for Adult Male by Location

Does location matter for time poverty? As discussed earlier, residing in urban and rural areas also determines the time poverty of adults. The case of Addis Ababa is an indicator that there is high probability of being time poor in the urban areas than rural. In this section, efforts are made to estimate time poverty of adults in rural and urban areas. Table 6-9 presents the time poverty indicators for both adult males and married men. As can be seen, adult men living in urban areas are slightly time poorer than rural and the same trend applies for poverty gap and severity.

In terms of marital status, urban married men are time poorer than rural married men. As for the time poverty gap and severity, there is a considerable difference between urban and rural married men where time poverty incidence, gap and severity are higher for urban married men than rural.

Note that although there is no substantive difference between urban and rural men in terms of time poverty, there is a considerable difference between married rural and urban men in terms of time poverty.

Table 6-9: Lower and Higher Threshold Time Poverty Index for adult male by Urban/Rural

| Urban/Rural | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|---------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Urban | 32.73 | 7.72 | 3.74 | 22.92 | 3.62 | 1.44 |
| Rural | 32.36 | 6.86 | 2.59 | 20.96 | 2.75 | 0.80 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |
| Married adult male | | | | | | |
| Urban/Rural | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Urban | 48.05 | 13.02 | 7.49 | 33.18 | 6.60 | 3.23 |
| Rural | 42.04 | 8.55 | 3.36 | 27.79 | 3.43 | 1.10 |
| Total | 43.11 | 9.34 | 4.08 | 28.74 | 3.99 | 1.47 |

Source: Based on time use survey

6.3.3.2. Time Poverty for Adult Female by Location

When we come to adult females, we observe a slight difference in time poverty indicators between urban and rural adult females. The difference is noticeable when we compare rural and urban married women. Urban adult females are slightly time poorer than rural adult women and other poverty indicators are also consistent in both lower and higher poverty lines (see Table 6-10). However, married rural women are time poorer than married urban women. Married rural females suffer from time poverty in both lower and higher poverty lines. The only difference is on the time poverty severity under the higher poverty line in which severity is higher for urban married women.

Table 6-10: Lower and Higher Threshold Time Poverty Index for Adult Female by Urban/Rural

| Urban/Rural | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Urban | 32.73 | 7.72 | 3.74 | 22.92 | 3.62 | 1.44 |
| Rural | 32.36 | 6.86 | 2.59 | 20.96 | 2.75 | 0.80 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |
| Married Women | | | | | | |
| Urban/Rural | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Urban | 38.27 | 8.84 | 3.63 | 25.32 | 3.79 | 1.21 |
| Rural | 45.92 | 10.35 | 3.76 | 29.49 | 4.17 | 1.09 |
| Total | 44.42 | 10.06 | 3.73 | 28.67 | 4.10 | 1.11 |

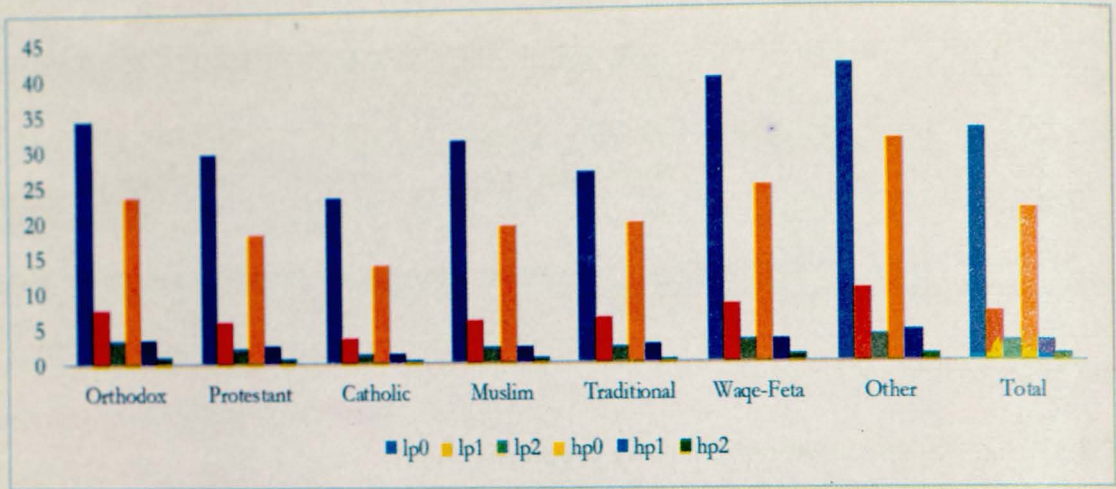
Source: Based on time use survey

6.4. Time Poverty for Adults by Religion and Marital Status

6.4.1. Time Poverty for Adult Males by Religion

Religion is among the factors which determine the time poverty of both male and females. To start with, adult males with other religions are the most time poor at 41.23% while catholic adult males are the least at 23.17%. Time poverty gap is also higher for adult males with other religion and the least for catholic followers and the same applies for time poverty severity (Figure 6-5). It is also important to consider that Waqefeta and Orthodox followers are also relatively time poor next to other religions. Overall, adult males who are followers of Waqefeta, Orthodox and Muslim are relatively time poor. Note that time poverty severity is high for orthodox followers.

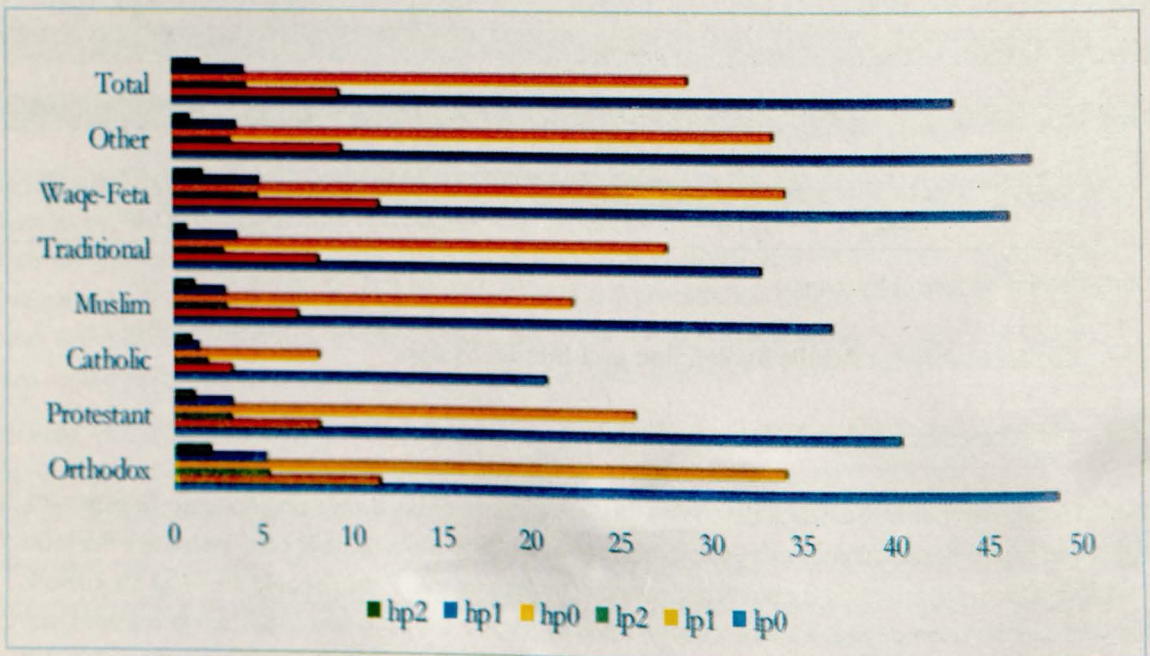
Figure 6-5: Lower and Higher Threshold Time Poverty Index for Adult Male by Religion



Source: Based on time use survey

As discussed earlier, getting married tends to increase time poverty. Hence, it is important to analyse the time poverty of married men which are followers of different religions. In this case, married orthodox followers are the highest time poor at 48.52%, while married catholic followers are the least time poor at 20.79%. Looking at the time poverty gap, it is large for married WaqFeta followers and the least for Catholics whereas time poverty severity is the highest for orthodox followers and the least for Catholics. Similar trends are observed under the higher time poverty line though there are minor changes on time poverty incidence (Figure 6-6). Time poverty differs for different religion followers and this emanates from the principles and values of these religions.

Figure 6-6: Lower and Higher Threshold Time Poverty Index for Married Men by Religion

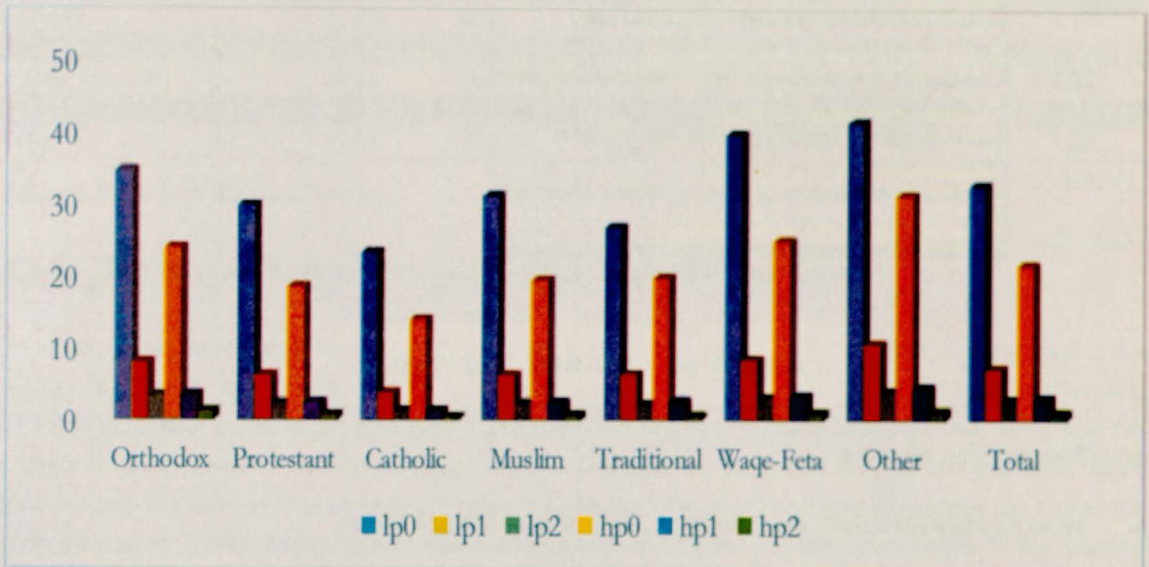


Source: Based on time use survey

6.4.2. Time Poverty for Adult Females by Religion

Similar to that of the adult males, it is imperative to assess the time poverty of adult females disaggregating by religion. Figure 6-7 presents the indicators of time poverty for adult females disaggregated by religion in both the lower and higher poverty lines. As the case is similar with the adult males in many aspects there is no need to repeat all these discussions here (see table 6-9).

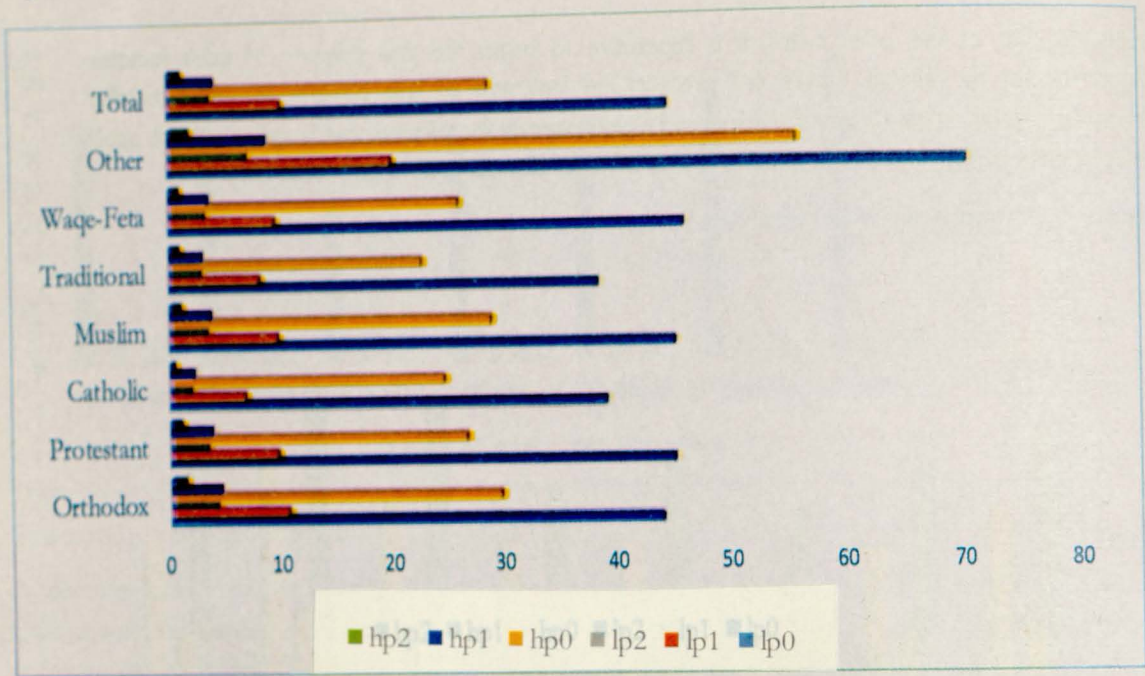
Figure 6-7: Lower and Higher Threshold Time Poverty Index for Adult Female by Religion



Source: Based on time use survey

Figure 6-8 presents all of the time poverty indicators for married women disaggregated by their religion. The highest time poverty level is recorded in other religions at 70.10% and the least but still high is recorded in traditional at 38.17%. In the same token, time poverty gap is higher for married other religion followers and smallest for Catholics where time poverty severity has the same trend. Using the upper time poverty line as a reference, the same trend and analysis is realized. These religions with the highest poverty incidence, gap and severity witnessed the same evidence for married women. The important point is that different religions followers have different time poverty levels, gaps and severity.

Figure 6-8: Lower and Higher Threshold Time Poverty Index for Married Women by Religion



Source: Based on time use survey

6.5. Time Poverty for Adults by Education, Gender and Marital Status

6.5.1. Time Poverty for Adult Male by Education and Marital Status

Level of schooling is an important factor which determines time poverty. In this section, we analyze to what extent level of schooling or education determines the time poverty of adult male. The focus is on adult men in general and married men in particular (Table 6-11). Time poverty incidence is highest for illiterate adult males at 41.21% while it is the lowest for low schooling at 22.94%. The same trends are observed for the average poverty gaps while time poverty severity is the highest for top schooling. Similar trends are witnessed when we use the upper time poverty line as a reference. It is interesting to look at the poverty levels of married men with different level of schooling. To this end, time poverty incidence is the highest for middle schooling at 44.49% and the lowest is recorded for the top schooling at 38.86% which is relatively high. The same pattern holds for poverty gaps and severity. It appears that married men are more time poorer than any other adult. And poverty gap and severity is also higher for these married ones.

Table 6-11: Lower and Higher Threshold Time Poverty Index for Adult Male by Level of Schooling

| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Illiterate | 41.21 | 8.76 | 3.27 | 27.15 | 3.51 | 0.99 |
| Low Schooling | 22.94 | 5.18 | 2.19 | 14.90 | 2.22 | 0.75 |
| Middle Schooling | 30.49 | 6.92 | 3.10 | 20.97 | 3.11 | 1.12 |
| Top Schooling | 36.11 | 7.38 | 3.45 | 22.55 | 3.17 | 1.33 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |
| Married Men | | | | | | |
| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Illiterate | 43.99 | 8.63 | 3.47 | 29.67 | 3.47 | 1.17 |
| Low Schooling | 42.06 | 9.60 | 4.34 | 27.61 | 4.17 | 1.60 |
| Middle Schooling | 44.49 | 11.69 | 5.90 | 30.43 | 5.59 | 2.34 |
| Top Schooling | 38.46 | 7.23 | 2.63 | 23.38 | 2.83 | 0.79 |
| Total | 43.11 | 9.34 | 4.08 | 28.74 | 3.99 | 1.47 |

Source: Based on time use survey

6.5.2. Time Poverty for Adult Females by Schooling and Marital Status

It is also important to discuss the poverty level of adult females (Table 6-12). Time poverty level is the highest for illiterate adult females at 41.21%, while it is the lowest for women with low level of schooling at 22.94%. Similar patterns are observed in poverty gaps and severity except that poverty severity is the highest for adult women with top schooling. A look at time poverty indicators for married women, it shows that not only the level of time poverty is higher, but also both the depth and severity indices are higher for married women. Similar facts are recorded for the lower and higher poverty lines. Similar to the married men, married women tend to have higher time poverty levels, depth and severity.

Table 6-12: Lower and Higher Threshold Time Poverty Index for Adult Female by Level of Schooling

| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Illiterate | 41.21 | 8.76 | 3.27 | 27.15 | 3.51 | 0.99 |
| Low Schooling | 22.94 | 5.18 | 2.19 | 14.90 | 2.22 | 0.75 |
| Middle Schooling | 30.49 | 6.92 | 3.10 | 20.97 | 3.11 | 1.12 |
| Top Schooling | 36.11 | 7.38 | 3.45 | 22.55 | 3.17 | 1.33 |
| Total | 32.44 | 7.05 | 2.84 | 21.39 | 2.94 | 0.94 |
| Married Women | | | | | | |
| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Illiterate | 45.08 | 10.04 | 3.64 | 29.37 | 4.03 | 1.05 |
| Low Schooling | 44.25 | 10.57 | 4.07 | 28.35 | 4.45 | 1.26 |
| Middle Schooling | 39.71 | 9.46 | 3.67 | 25.75 | 4.04 | 1.14 |
| Top Schooling | 42.54 | 8.61 | 3.98 | 19.91 | 3.42 | 1.59 |
| Total | 44.42 | 10.06 | 3.73 | 28.67 | 4.10 | 1.11 |

Source: Based on time use survey

6.6. Time Poverty of Boys and Girls

So far we have attempted to analyze time poverty for the adult males and females disaggregated by gender, marital status, location and region. This section focuses on the time poverty of boys and girls. In doing so, lower and higher threshold time poverty lines are constructed for boys and girls in minutes using mean time worked by boys and girls per day. The lower threshold time poverty limit for boys and girls is calculated as mean minutes worked by

boys and girls per day plus a quarter of boys' and girls' leisure time in minutes. This gives rise to a lower threshold time poverty limit of 401 minutes per day for boys and girls. The higher threshold time poverty limit for boys and girls is calculated as mean minutes worked by boys and girls per day plus half of boys' and girls' leisure time in minutes. This results in a higher threshold time poverty limit of 480 minutes per day for boys and girls. The following lower and upper threshold time poverty indices for boys and girls are computed using these time poverty lines. Thus, in this section the time poverty of boys and girls will be assessed by looking at their region, religion, their location and level of schooling using both the lower and higher poverty lines.

6.6.1. Time Poverty for Boys and Girls by Region

The time poverty of boys and girls is expected to be different from adult males and females. About 41.27% of boys and girls are time poor and the average poverty gap is 1.21 minutes per day and poverty severity as high as 7.52 under the lower poverty line whereas poverty level is 31.23%, poverty gap 6.32 minutes per day and severity is 2.35 (Table 6-13). Comparing the regions, the highest time poverty incidence for boys and girls is observed in Somali region at 57.80% while the least is recorded in Harari at 34.40%. In the same way, time poverty gap is highest for Somali region at 2.68 minutes and the least is recorded in Addis Ababa at 0.04 minutes per day. Time poverty severity is also the highest for Somali region at 10.93 and the least is in Harari at 3.50. Hence, it can be seen that boys and girls are time poor particularly in the pastoralist regions of the country such as Afar and Somali. This will be an interesting subject for further study.

Table 6-13: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 41.58 | 0.59 | 8.19 | 34.13 | 6.94 | 2.62 |
| Afar | 52.95 | 2.23 | 9.80 | 43.64 | 8.72 | 2.81 |
| Amhara | 40.22 | 1.14 | 8.53 | 31.98 | 7.07 | 2.77 |
| Oromia | 40.32 | 1.49 | 7.09 | 29.63 | 6.03 | 2.15 |
| Somali | 57.80 | 2.68 | 10.93 | 49.52 | 9.73 | 3.14 |
| Benishangul-Gumuz | 37.19 | 0.35 | 5.05 | 27.87 | 4.14 | 1.60 |
| SNNPR | 41.38 | 0.88 | 6.84 | 28.33 | 5.65 | 2.15 |
| Gambela | 38.02 | 0.35 | 6.12 | 30.21 | 5.02 | 2.01 |
| Harari | 34.40 | 0.27 | 3.50 | 24.71 | 2.90 | 0.96 |
| Addis Ababa | 47.15 | 0.04 | 4.15 | 43.40 | 3.29 | 1.45 |
| Dire Dawa | 46.53 | 1.48 | 6.35 | 41.89 | 5.31 | 2.01 |
| Total | 41.27 | 1.21 | 7.52 | 31.23 | 6.32 | 2.35 |

Source: Based on time use survey

6.6.2. Time Poverty for Boys by Region

On average, about 43.55% of boys are found to be time poor whereas the average time poverty gap is fairly small at 1.20 minutes per day. However, time poverty severity is clearly high at 8.19 (Table 6-14). On the other hand, looking the poverty indicators of these boys using the upper time poverty line, about 33.57% of the boys are time poor and the poverty gap is about 6.85 minutes per day and poverty severity is 2.61.

Comparing the time poverty of boys across regions, the highest poverty level for boys is recorded in Afar at 60.57% and the lowest is in Harari at 37.44%. The poverty gap is also higher in Afar region at 2.92 minutes per day while the least is in Addis Ababa which almost at the poverty line. The poverty severity is also the highest for Afar region at 11.59. Using the higher poverty line as a reference, the highest poverty is observed in Addis Ababa and the least is in Harari at 28.34%. This shows that a significant number of boys are time poor and in some regions; the pastoralist areas of Afar and Somali are the home for time poor boys.

Table 6-14: Lower and Higher Threshold Time Poverty Index for Boys by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 47.45 | 0.52 | 8.88 | 39.25 | 7.57 | 2.82 |
| Afar | 60.57 | 2.92 | 11.59 | 50.72 | 10.24 | 3.34 |
| Amhara | 46.67 | 1.53 | 11.45 | 38.16 | 9.40 | 3.88 |
| Oromia | 40.93 | 1.32 | 7.38 | 30.61 | 6.23 | 2.29 |
| Somalie | 59.32 | 2.48 | 9.76 | 50.47 | 8.83 | 2.65 |
| Benishangul-Gumuz | 39.79 | 0.57 | 6.11 | 31.85 | 4.78 | 2.19 |
| SNNPR | 39.36 | 0.64 | 5.36 | 26.28 | 4.46 | 1.60 |
| Gambela | 43.28 | 0.43 | 7.75 | 37.91 | 6.27 | 2.68 |
| Harari | 37.44 | 0.22 | 2.99 | 28.34 | 2.41 | 0.80 |
| Addis Ababa | 55.38 | 0.00 | 4.20 | 53.82 | 3.62 | 1.31 |
| Dire Dawa | 57.31 | 1.23 | 6.00 | 53.02 | 4.68 | 1.98 |
| Total | 43.55 | 1.20 | 8.19 | 33.57 | 6.85 | 2.61 |

Source: Based on time use survey

6.6.3. Time Poverty for Girls by Region

As per Table 6-15, close to 38.8% of the girls are time poor which is on average less than boys. The poverty gap is 1.22 minutes per day while time poverty severity 6.82 under the lower poverty line. On the other hand, using the higher level of poverty line, about 28.69% girls are time poor and average time poverty gap 5.77 minutes per day and time poverty severity is 2.08. Contrary to expectation, on average girls are less time poor than boys as the average time poverty gap and poverty severity are also higher for boys than girls.

When we compare regions, the highest time poor girls live in Somali at 55.95% and the least is in Harari at 31.38%. The highest poverty gaps are also recorded in Somali while the least is in Benishangul-Gumuz. Poverty severity is also the highest in Somali while it the lowest in Harari. Similar trends are observed in the higher level of poverty line. From the above two discussions it can be seen that time poverty is higher for boys than girls and other indicators are also in favor of girls.

Table 6-15: Lower and Higher Threshold Time Poverty Index for Girls by Region

| Region | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Tigray | 35.51 | 0.66 | 7.53 | 28.81 | 6.34 | 2.44 |
| Afar | 43.39 | 1.36 | 7.61 | 34.74 | 6.86 | 2.16 |
| Amhara | 33.32 | 0.73 | 5.47 | 25.39 | 4.64 | 1.60 |
| Oromia | 39.63 | 1.69 | 6.78 | 28.53 | 5.81 | 1.99 |
| Somalie | 55.95 | 2.91 | 12.19 | 48.37 | 10.70 | 3.67 |
| Benishangul-Gumuz | 34.37 | 0.12 | 4.07 | 23.56 | 3.55 | 1.07 |
| SNNPR | 43.48 | 1.14 | 8.32 | 30.47 | 6.84 | 2.70 |
| Gambela | 31.53 | 0.25 | 4.47 | 20.73 | 3.77 | 1.34 |
| Harari | 31.38 | 0.31 | 3.96 | 21.11 | 3.33 | 1.10 |
| Addis Ababa | 40.19 | 0.08 | 4.13 | 34.59 | 3.09 | 1.54 |
| Dire Dawa | 36.57 | 1.70 | 6.57 | 31.61 | 5.70 | 2.03 |
| Total | 38.80 | 1.22 | 6.82 | 28.69 | 5.77 | 2.08 |

Source: Based on time use survey

6.6.4. Time Poverty of Boys and Girls by Rural/Urban

It has been indicated that living in rural or urban areas has implications for time use of adults. Table 6-16 presents the time poverty of boys and girls together, boys and girls disaggregated by rural and urban areas. To start with, rural boys and girls are time poorer than urban boys and girls. The time poverty gap and severity are also considerably higher for the rural boys and girls. The same trend has been observed when we consider the upper time poverty line (see Table 6-16). Comparing the rural and urban boys, similar trends are observed such that rural boys are time poorer than urban boys and poverty gaps and severity are substantially higher for rural boys than girls. Similar figures are registered when we consider the upper poverty line except that poverty incidence is higher for urban boys than rural boys. In the same analogy, rural girls are time poorer than urban girls and time poverty gap and severity are also noticeably higher for rural girls than urban in both lower and higher poverty lines. This finding seems consistent with the general understanding of the time poverty of rural and urban boys and girls. Due to social and economic reasons, rural boys and girls are expected to be time poorer than urban boys and girls.

Table 6-16: Lower and Higher Threshold Time Poverty Index for Boys by Urban/Rural

| Urban/Rural | Boys | | | | | |
|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Urban | 40.52 | 0.10 | 4.29 | 36.34 | 3.59 | 1.39 |
| Rural | 44.20 | 1.43 | 8.84 | 32.98 | 7.40 | 2.81 |
| Total | 43.55 | 1.20 | 8.19 | 33.57 | 6.85 | 2.61 |
| Urban/Rural | Girls | | | | | |
| | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Urban | 29.56 | 0.36 | 3.64 | 24.03 | 3.04 | 1.11 |
| Rural | 41.31 | 1.45 | 7.61 | 29.96 | 6.44 | 2.31 |
| Total | 38.80 | 1.22 | 6.82 | 28.69 | 5.77 | 2.08 |
| Urban/Rural | Boys and Girls | | | | | |
| | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
| Urban | 34.74 | 0.24 | 3.92 | 29.84 | 3.28 | 1.23 |
| Rural | 42.85 | 1.44 | 8.26 | 31.56 | 6.94 | 2.58 |
| Total | 41.27 | 1.21 | 7.52 | 31.23 | 6.32 | 2.35 |

Source: Based on time use survey

6.6.5. Time Poverty of Boys and Girls by Religion

This section focuses on how religion affects the time use of boys and girls. We start with the overall time poverty for girls and boys. Table 6-17 shows that traditional followers are the highest time poor boys and girls at 55.13% while the least is for catholic followers at 36.46%. Poverty gap is the least for catholic followers and the highest for Muslim followers. However, poverty severity is the highest for Waqe-Feta followers. We don't discuss the case for the higher poverty line as it is similarity with the lower once.

Table 6-17: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Religion

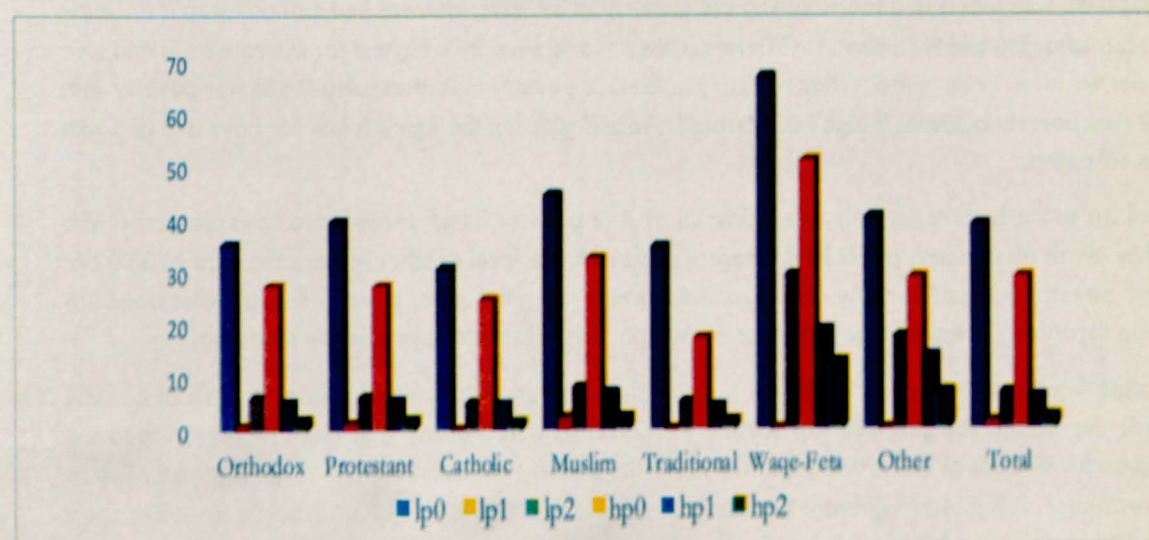
| Religion | lp0 | lp1 | lp2 | hp0 | hp1 | hp2 |
|--------------|--------------|-------------|-------------|--------------|-------------|-------------|
| Orthodox | 40.09 | 1.03 | 7.85 | 31.71 | 6.56 | 2.52 |
| Protestant | 40.09 | 1.05 | 6.04 | 27.79 | 5.12 | 1.78 |
| Catholic | 36.46 | 0.00 | 4.09 | 31.51 | 3.83 | 1.00 |
| Muslim | 44.06 | 1.68 | 7.86 | 32.98 | 6.68 | 2.39 |
| Traditional | 55.13 | 1.38 | 16.79 | 44.05 | 13.97 | 5.87 |
| Waqe-Feta | 53.35 | 0.78 | 17.60 | 42.77 | 12.60 | 6.93 |
| Other | 39.01 | 1.51 | 15.52 | 32.23 | 12.57 | 5.88 |
| Total | 41.27 | 1.21 | 7.52 | 31.23 | 6.32 | 2.35 |

Source: Based on time use survey

Figure shows the poverty level of girls disaggregated by religion. In this case, the highest time poor girls are observed in Waqe-Feta at 67.01% and the least is recorded in catholic followers at 30.53%. Poverty gap however is the highest for Muslim girls and time poverty severity is the highest for Waqe-feta follower girls.

Considering the upper poverty line, poverty incidence, gap and severity are the highest for Waqe-feta follower girls, whereas the least time poor are those traditional follower girls and the least severity is for catholic girls (see Figure 6-9).

Figure 6-9: Lower and Higher Threshold Time Poverty Index for Girls by Religion

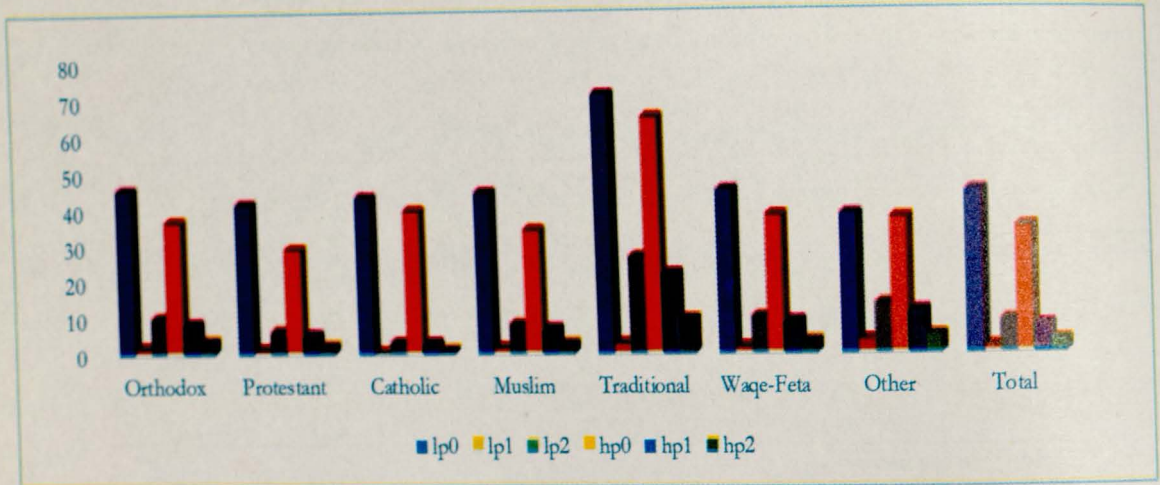


Source: Based on time use survey

Looking at the time poverty of boys who are followers of different religions, Traditional religion followers are by far the highest time poor at 70.27% where as other religion followers are the least at 37.58%. Poverty gap is the highest for other religion followers at 3.27 minutes per day while catholic followers are

exactly at the poverty line or no need any time transfer under the lower poverty line. Poverty severity is the highest for traditional follower boys. No need to discuss the case in the higher poverty line as similar facts are observed.

Figure 6-10: Lower and Higher Threshold Time Poverty Index for Boys by Religion



Source: Based on time use survey

6.6.6. Time Poverty of Boys and Girls by Level of Schooling

The focus of this section is thus to describe how level of schooling affect the time use of boys and girls. As boys and girls have different level of education and even some of them will be currently at school. Table 6-18 presents the time poverty of boys and girls disaggregated by their level of schooling.

To start with the entire boys and girls, illiterate boys and girls are the highest time poor at 66.70% compared with others and top schooling are the least at 29.90%, whereas time poverty gap is the least for top schooling and the highest for illiterate. Time poverty severity is highest for illiterate boys and girls under the lower poverty line. When we analyze the time poverty indicators using the higher poverty line, still time poverty incidence is high for illiterate boys and girls, but the figure is low for boys and girls with low schooling.

Looking at the boys separately, the incidence of time poverty is high for illiterate boys compared with other levels of schooling at 70.38% whereas boys with top level of schooling are the least at 33.02%. Time poverty gap and severity also show similar trend. Using the upper poverty line, a similar trend has been recorded except that the incidence of time poverty is low for boys with low schooling.

Comparing the time poverty of girls, it appears that time poverty is high for illiterate girls at 63.03% while the least is for girls with top schooling at 29.42%. Time poverty gap and severity are also the highest for illiterate girls. It is also important to see the poverty indicators using the higher poverty line as a reference. Still illiterate girls are the time poorest and the least is for girls with middle schooling. From the above discussion, it is possible to infer that time poverty seems to be high for illiterate boys and girls.

Table 6-18: Lower and Higher Threshold Time Poverty Index for Boys and Girls by Level of Schooling

| Level of Schooling | lp ₀ | lp ₁ | lp ₂ | hp ₀ | hp ₁ | hp ₂ |
|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Illiterate | 66.70 | 3.20 | 14.29 | 51.12 | 12.22 | 4.41 |
| Low Schooling | 37.13 | 1.04 | 6.67 | 27.69 | 5.56 | 2.10 |
| Middle Schooling | 35.57 | 0.06 | 4.41 | 28.09 | 3.69 | 1.37 |
| Top Schooling | 29.90 | 0.00 | 1.31 | 29.90 | 0.56 | 0.01 |
| Total | 41.27 | 1.21 | 7.52 | 31.23 | 6.32 | 2.35 |
| Boys | | | | | | |
| Illiterate | 70.38 | 2.77 | 15.94 | 55.13 | 13.76 | 4.98 |
| Low Schooling | 38.49 | 1.11 | 7.24 | 29.15 | 5.96 | 2.35 |
| Middle Schooling | 42.02 | 0.11 | 4.46 | 34.06 | 3.80 | 1.31 |
| Top Schooling | 33.02 | 0.00 | 0.00 | 33.02 | 0.00 | 0.00 |
| Total | 43.55 | 1.20 | 8.19 | 33.57 | 6.85 | 2.61 |
| Girls | | | | | | |
| Illiterate | 63.03 | 3.64 | 12.68 | 47.12 | 10.73 | 3.85 |
| Low Schooling | 35.59 | 0.97 | 6.03 | 26.02 | 5.12 | 1.82 |
| Middle Schooling | 29.54 | 0.01 | 4.36 | 22.51 | 3.60 | 1.41 |
| Top Schooling | 29.42 | 0.00 | 1.45 | 29.42 | 0.61 | 0.01 |
| Total | 38.80 | 1.22 | 6.82 | 28.69 | 5.77 | 2.08 |

Source: Based on time use survey

6.7. Results of the Econometric Model

As we outlined in the model specification of time allocation and specification for the correlates of time poverty in section 5.3, our study tried to include all the important variables proposed to determine time allocation and likelihood of being time poor. However, as our MLE technique is nonlinear, those variables which were found to cause multicollinearity in each specification are dropped from each model to make our estimation converge. Variables like regional dummies for Afar, Amhara, SNNP, Benshangul-Gumuz and Dire Dawa in the time allocation model for Non-productive activity & unpaid work for married person; dummies for middle and top schooling in market work and unpaid work time allocation for married person, men and women and for married persons respectively; dummies for traditional and top schooling in market work and unpaid work time allocation for boys and girls and in non productive activity for married person, boys and girls; and dummies in correlates of poverty for traditional and top schooling for married person and for traditional, middle, top schooling for boys & girls, boys, girls are among the variables dropped due convergence (multicollinearity) issues in our analysis.

6.7.1. Determinants of Market Work Time Allocation

6.7.1.1. Time Allocation of Married Person for Market Work

The p-values of the income, education, age and square age variables, number of children-teen, and wage show that they are all statistically significant. Note that the positive (negative) coefficients indicate the association between time allocations for market work for married people likely increases (declines) with a variable. The change in the time allocation due to a change in the explanatory variables can be investigated by computing the marginal effects at the mean values of variables.

With that note, the likelihood of time allocation declines for married people who are illiterate compared with married individuals with low and traditional education. The positive marginal effect that was estimated about wage reveals that the allocating time for market work increases as wage increases. After all, in general terms, higher wage levels might be associated to intense job market activity which leads to increase allocation of time for market work. However, as level of income increases, market work time decreases. Income enables individuals to allocate more time to other activities such as leisure.

The evidence of allocation of time for market work increasing as an individual is younger and diminishing as he or she gets older seems to hold. This may be simply due to the fact that as married individuals grow older, the strength to be involved in market work tends to decrease. The time trajectory throughout one's life turn out to get an inverted U-shape. This indicates that the marginal effects are positive for younger individuals and negative for senior ones, revealing that allocating time for market work tends to diminish after a certain age.

The fact of a person being in rural area allocates more time for market work compared with those living in urban area. Somehow, these results seem to confirm the numbers reported in the descriptive analysis that a large proportion of time-poor individuals residing in rural area.

Table 6-19: Determinants of time allocation of married person (marginal effects): Market work time

| Determined –Market Work Time | | Delta-Method | | |
|---|-------------|--------------------------------------|--------|-----------------------------|
| Determinants | Coefficient | SD | Z | P-Value |
| Illiterate | -0.1123817 | .0128263 | -8.76 | 0.000 |
| Low schooling (<=6 years of education) | -0.0218482 | .006226 | -3.51 | 0.000 |
| Traditional schooling | -0.0033418 | .0013551 | -2.47 | 0.014 |
| Number of children | 0.0027915 | .0165356 | 0.17 | 0.866 |
| Number of children-preschool (0-2 years) | -0.0164567 | .0105387 | -1.56 | 0.118 |
| Number of children teen ages (5-14 years) | 0.0116607 | .0058862 | 1.98 | 0.048 |
| Age | 0.8868242 | .0847841 | 10.46 | 0.000 |
| Age squared | -0.3919879 | .0400705 | -9.78 | 0.000 |
| Wage | 0.1989334 | .0088931 | 22.37 | 0.000 |
| Income | -0.1673395 | .0082237 | -20.35 | 0.000 |
| Rural_dummy | 0.01916 | .0037321 | 5.13 | 0.000 |
| Region dummy (reference Addis Ababa) | | | | |
| Region_Tigray | -0.00786 | .0018215 | -4.32 | 0.000 |
| Region_Afar | -0.0029422 | .0005934 | -4.96 | 0.000 |
| Region_Amhara | -0.0350313 | .0078884 | -4.44 | 0.000 |
| Region_Oromia | -0.0400402 | .0130721 | -3.06 | 0.002 |
| Region_Somali | -0.0023566 | .00087 | -2.71 | 0.007 |
| Region_Benishangule-Gumuz | -0.0009736 | .000458 | -2.13 | 0.033 |
| Region_SNNPR | -0.0250853 | .0070408 | -3.56 | 0.000 |
| Region_Gambela | -0.0009484 | .0001873 | -5.06 | 0.000 |
| Region_Harari | -0.0002135 | .0000951 | -2.25 | 0.025 |
| Region_Dire Dawa | 0.0001179 | .0001486 | 0.79 | 0.427 |
| Number of observations = 24712 | | F(21, 24691) = 73.34 | | Prob > F = 0.0000 |
| Log pseudo likelihood = -1.650e+08 | | Pseudo R² = 0.0086 | | |

Do the determinants of time allocation for market work differ by gender? Table 7-2 presents the tobit results of the determinants of market time allocation for married men. The result indicates that the time allocation of married men for market work is influenced by number of children, location (rural versus urban and regions) and other variables. Among educational variables, only traditional schooling is negatively associated with the time allocation of married men. Being in rural areas is likely to increase the time allocation towards market work. Married men residing in Addis Ababa tend to allocate more time to market work compared with married men in other regions.

Table 6-20: Determinants of time allocation of married men (marginal effects): Market work time

| Determined–Market Work Time Determinants | Delta-Method | | | |
|---|--------------------------------------|----------|-----------------------------|---------|
| | Coefficient | SD | Z | P-Value |
| Illiterate | -0.0087074 | .0100145 | -0.87 | 0.385 |
| Low schooling | -0.0070926 | .0081531 | -0.87 | 0.384 |
| Traditional schooling | -0.0070625 | .0017655 | -4.00 | 0.000 |
| Number of children | 0.0465149 | .0193703 | 2.40 | 0.016 |
| Number of children-preschool (0-2 years) | -0.0430379 | .012573 | -3.42 | 0.001 |
| Number of children teen ages (5-14 years) | 0.0283725 | .0066867 | 4.24 | 0.000 |
| Rural_dummy | 0.0223813 | .004733 | 4.73 | 0.000 |
| Region_Tigray | -0.0003804 | .0019882 | -5.33 | 0.000 |
| Region_Afar | -0.0106023 | .0005514 | -4.81 | 0.000 |
| Region_Amhara | -0.0026501 | .0087411 | -5.76 | 0.000 |
| Region_Oromia | -0.0503474 | .0134964 | -4.68 | 0.000 |
| Region_Somali | -0.0631877 | .0009119 | -4.89 | 0.000 |
| Region_Benishangule- Gumuz | -0.0044566 | .0004417 | -3.42 | 0.001 |
| Region_SNNPR | -0.0015119 | .0071801 | -5.14 | 0.000 |
| Region_Gambela | -0.0369052 | .0001784 | -5.23 | 0.000 |
| Region_Harari | -0.0009332 | .0001102 | -4.82 | 0.000 |
| Region_Dire Dawa | -0.0005308 | .0001605 | -4.86 | 0.000 |
| Number of observations = 11146 | F(20,11126) = 150.50 | | Prob > F = 0.0000 | |
| Log pseudo likelihood = -74612751 | Pseudo R² = 0.0178 | | | |

Table 7-3 presents the marginal effects of the determinants of time allocation of married women for market work. The determinants of time allocation for market work of married women are similar to that of married men (Table 7-3). Two exceptions are noted. First, illiteracy is not correlated with time allocation of married women for market work. Second, there is no statistically significant difference being in Harari or in Addis Ababa.

Table 6-21: Determinants of time allocation of married women (marginal effects): Market work time

| Determined–Market Work Time Determinants | Delta-Method | | | |
|---|--------------------------------------|----------|-----------------------------|---------|
| | Coefficient | SD | Z | P-Value |
| Illiterate | -0.0368021 | .0250782 | -1.47 | 0.142 |
| Low schooling | -0.0148485 | .007166 | -2.07 | 0.038 |
| Traditional schooling | 0.0011763 | .0016636 | 0.71 | 0.479 |
| Number of children | 0.0463375 | .0216677 | 2.14 | 0.032 |
| Number of children-preschool (0-2 years) | -0.0761372 | .0139965 | -5.44 | 0.000 |
| Number of children teen ages (5-14 years) | 0.0534052 | .0081314 | 6.57 | 0.000 |
| Rural_dummy | 0.0197816 | .004718 | 4.19 | 0.000 |
| Region_Tigray | -0.0082368 | .0026038 | -3.16 | 0.002 |
| Region_Afar | -0.0059417 | .0009535 | -6.23 | 0.000 |
| Region_Amhara | -0.0411218 | .0112013 | -3.67 | 0.000 |
| Region_Oromia | -0.0505214 | .0195742 | -2.58 | 0.010 |
| Region_Somali | -0.0047485 | .0013124 | -3.62 | 0.000 |
| Region_Benishangule- Gumuz | -0.0020188 | .0007247 | -2.79 | 0.005 |
| Region_SNNPR | -0.0278223 | .0106354 | -2.62 | 0.009 |
| Region_Gambela | -0.0012683 | .0002802 | -4.53 | 0.000 |
| Region_Harari | -0.0001968 | .000134 | -1.47 | 0.142 |
| Region_Dire Dawa | 0.0005154 | .0002237 | 2.30 | 0.021 |
| Number of observations = 13561 | F(20, 13541) = 223.11 | | Prob > F = 0.0000 | |
| Log pseudo likelihood = -87040155 | Pseudo R² = 0.0210 | | | |

6.7.1.2. Time Allocation of Boys and Girls for Market Work

The p-values of the illiterate, income, wage and rural dummy show that they are all statistically significant. Time allocation for market work increases for illiterate boys and girls, significant at five percent level. The positive marginal effect that was estimated about wage reveals that boys and girls allocate more time for market work as wage increases. Income appears to be negatively associated with time allocation for market work due to substitution effect as boys and girls tend to allocate time for other activities including leisure. Boys and girls in rural areas tend to allocate less time for market work compared with those in urban areas.

Table 6-22: Determinants of time allocation of boys and girls (marginal effects): Market work

| Determined—Market Work Time Determinants | Delta-Method | | | |
|---|--------------|--------------------------------|--------|-------------------|
| | Coefficient | SD | Z | P-Value |
| Illiterate | 0.1432727 | .0681741 | 2.10 | 0.036 |
| Low schooling | 0.4389847 | .3071054 | 1.43 | 0.153 |
| Middle schooling | 0.0517698 | .0532699 | 0.97 | 0.331 |
| Age | 0.0354828 | .8411789 | 0.04 | 0.966 |
| Age squared | 0.2383197 | .4330654 | 0.55 | 0.582 |
| Wage | 0.2100691 | .0182131 | 11.53 | 0.000 |
| Income | -0.1461868 | .01449 | -10.09 | 0.000 |
| Rural_dummy | -0.023262 | .0044505 | -5.23 | 0.000 |
| Number of observations = 8484 | | F (8, 8476) = 59.97 | | Prob > F = 0.0000 |
| Log pseudo likelihood = -62654347 | | Pseudo R ² = 0.0111 | | |

6.7.2. Determinants of Unpaid Work Time Allocation

6.7.2.1. Determinants of Time Allocation of Married Persons: Unpaid Work Time

Table 7-5 presents the results of the determinants of time allocation of married person to unpaid work activities. Among the education variables, illiterate and low schooling (with less than equal to six years of schooling) are positively correlated with time allocation for unpaid work, while the likelihood of married person with traditional schooling allocate less time for unpaid work.

Of the demographic variables, the time allocation to unpaid work increases with number of children and this would seem intuitively sensible as the increase in the number of children is often associated with larger workloads. The demographic distribution of a household is therefore very important. For example, if households are experiencing a large increase in the number of children or infants, then time pressures for adult heads are likely to increase. This involves relatively high number of hours spent on domestic and care duties by married person.

Age of the household head is another determinant of unpaid work time allocation, i.e. it is negatively correlated with unpaid work time. It is young married person who allocate more time to unpaid work; married person tend to allocate less time for unpaid work activities as age increases.

Wage is positively correlated with unpaid work time allocation, i.e. for married person the likelihood of time allocation for unpaid work increases as wage increases. This has to do with income effect as married person tends allocate more time for unpaid work such as leisure, household chores, etc. The rural dummy is negative implying that married person living in rural areas is less likely to allocate more time for unpaid

work activities compared with those residing in urban areas. This seems consistent with the time poverty analysis in that, in particular, rural women are time-poor compared with their urban counterparts.

Infrastructure types are also correlated with time allocation for unpaid work activities. They are all positive and strongly significant, indicating that infrastructural facilities are important determinants of time allocation for unpaid work activities. For instance, married person who depend on wood and animal for energy purposes likely to allocate more time for unpaid activities. Unavailability of modern energy sources tends to significantly increase married person's work burden for collecting wood and animal dung for fuel wood. The same holds for fetching water for drinking and other purposes. So, in settings with inadequate facilities, the result indicates that married person are more likely to be burdened by resource collection responsibilities.

Table 6-23: Determinants of time allocation of married person (marginal effects): Unpaid Work Time

| Determined –Unpaid Work Time | | Delta-Method | | |
|------------------------------------|-------------|--------------------------------|--------|-------------------|
| Determinants | Coefficient | SD | Z | P-Value |
| Illiterate | 0.1027896 | .0086968 | 11.82 | 0.000 |
| Low schooling | 0.0311431 | .0042063 | 7.40 | 0.000 |
| Traditional schooling | -0.0105019 | .0008197 | -12.81 | 0.000 |
| Number of children | 0.0485544 | .0130961 | 3.71 | 0.000 |
| Number of children-_preschool | -0.0028277 | .0071324 | -0.40 | 0.692 |
| Number of children-teen | -0.0054536 | .0064684 | -0.84 | 0.399 |
| Age | -0.1929743 | .011026 | -17.50 | 0.000 |
| Wage | 0.0147764 | .0039646 | 3.73 | 0.000 |
| Income | 0.0025237 | .0049142 | 0.51 | 0.608 |
| Rural_dummy | -0.0210271 | .0026469 | -7.94 | 0.000 |
| Region_Amhara | 0.0449259 | .0025809 | 17.41 | 0.000 |
| Region_Oromia | 0.0293604 | .0038331 | 7.66 | 0.000 |
| Region_SNNPR | 0.0210926 | .0021426 | 9.84 | 0.000 |
| Region_Gambela | -0.0007316 | .0000896 | -8.17 | 0.000 |
| Facilities | | | | |
| Energy-wood | 0.0937204 | .0152325 | 6.15 | 0.000 |
| Energy-animal dung | 0.0126573 | .0018953 | 6.68 | 0.000 |
| Water good | 0.0126986 | .0042673 | 2.98 | 0.003 |
| Water-other | 0.0137347 | .0026087 | 5.26 | 0.000 |
| Number of observations = 24357 | | F(18, 24339) = 173.09 | | Prob > F = 0.0000 |
| Log pseudo likelihood = -1.618e+08 | | Pseudo R ² = 0.0118 | | |

6.7.2.2. Determinants of Time Allocation of Boys and Girls: Unpaid Work Time

Table 7-6 provides the results of the determinants of time allocation of boys and girls for unpaid work activities. Of the education variables, illiterate boys and girls are likely to allocate more time for unpaid work activities. Age of boys and girls appears to be another determinant of time allocation for unpaid work activities, i.e. boys and girls are likely to allocate more time for unpaid activities as their age increases.

While wage is positively correlated with unpaid work time allocation, income of boys and girls is negatively associated with time allocation for unpaid work. The positive correlation between wage and time allocation for unpaid work activities seems counterintuitive as one expects boys and girls tend to allocate less time for unpaid work activities. However, given that boys and girls live with their parents, an increase in wages means that household activities are likely to be handled by boys and girls as it is also

expensive to employ people to do these activities. As for income, it has to do with income effect as boys and girls are likely to allocate less time for unpaid work such as household chores, etc. as income increases.

The rural dummy is negative implying that boys and girls living in rural areas is less likely to allocate time to unpaid work activities compared with those residing in urban areas. This is in line with the observation that boys and girls in rural areas are time-poorer compared with those in urban areas.

Table 6-24: Determinants of time allocation of boys and girls (marginal effects): Unpaid Work Time

| Determined -Unpaid Work Time Determinants | Coefficient | Delta-Method | | |
|--|-------------|--------------------------------|-------|-------------------|
| | | SD | Z | P-Value |
| Illiterate | 0.0913773 | .0474094 | 1.93 | 0.054 |
| Low schooling | 0.1991195 | .213971 | 0.93 | 0.352 |
| Middle schooling | 0.0159528 | .0366248 | 0.44 | 0.663 |
| Age | 0.3482342 | .0480392 | 7.25 | 0.000 |
| Wage | 0.0915117 | .0082444 | 11.10 | 0.000 |
| Income | -0.0802322 | .0087064 | -9.22 | 0.000 |
| Rural_dummy | -0.0290593 | .0036371 | -7.99 | 0.000 |
| Region_Tigray | 0.011073 | .0031532 | 3.51 | 0.000 |
| Region_Afar | 0.001738 | .0007961 | 2.18 | 0.029 |
| Region_Amhara | 0.0552223 | .0141907 | 3.89 | 0.000 |
| Region_Oromia | 0.0684041 | .0236671 | 2.89 | 0.004 |
| Region_Somali | 0.0056534 | .0012982 | 4.35 | 0.000 |
| Region_Benishangule- Gumuz | 0.0007704 | .0005671 | 1.36 | 0.174 |
| Region_SNNPR | 0.0415894 | .0132938 | 3.13 | 0.002 |
| Region_Gambela | 0.0000611 | .0003002 | 0.20 | 0.839 |
| Region_Harari | 0.0003083 | .0000977 | 3.16 | 0.002 |
| Region_Dire Dawa | 0.0007563 | .0001679 | 4.50 | 0.000 |
| Facilities | | | | |
| Energy_wood | 0.0324178 | .0557058 | 0.58 | 0.561 |
| Energy_animal dung | 0.0023474 | .0071516 | 0.33 | 0.743 |
| Energy_charcoal | -0.0005256 | .001271 | -0.41 | 0.679 |
| Energy_other | -0.0001768 | .0005636 | -0.31 | 0.754 |
| Water_good | 0.0151924 | .0089873 | 1.69 | 0.091 |
| Water_other | 0.0284153 | .0054459 | 5.22 | 0.000 |
| Number of observations = 8323 | | F(23, 8300) = 55.65 | | Prob > F = 0.0000 |
| Log pseudo likelihood = -61658593 | | Pseudo R ² = 0.0115 | | |

6.7.3. Determinants of None Productive Activity Time Allocation

6.7.3.1. Determinants of Time Allocation of Married Persons: None Productive Activity Time

Table 7-7 presents time allocation determinants of married persons to none productive activity. The age of the married person results in negative, and its squared is generally positive but the former is not significant for nonproductive activities. This means that married people tend to participate in more nonproductive activities as the person gets older. This sheds some light on the household's life cycle.

Among the demographic variables, having an extra child allows the household decreases the likelihood married people not to allocate time to nonproductive activities. In other words, the probability that married people will participate in nonproductive activities is lower the larger higher the number of children.

The coefficient of illiteracy is negative for nonproductive activities indicating that illiterate married people spend more time on nonproductive activities. Other indicators for schooling are not statistically significant.

The coefficient of wage is negative, indicating that the likelihood of allocating time to nonproductive activities diminishes as wage increases. Generally, pay raise tends to stimulate labour mobility and hence influence the allocation of time between activities. Time allocated to nonproductive activities declines as wage increases means that married people allocate more time to other activities. On the other hand, income affects time allocated to nonproductive activities, suggesting higher income may enable individuals may enjoy the time spent in nonproductive activities.

Table 6-25: Determinants of time allocation of married person (marginal effects): None Productive Activity Time

| Determined – None Productive Time Determinants | Coefficient | Delta-Method | | |
|---|--------------------------------|--------------|-------------------|---------|
| | | SD | Z | P-Value |
| Illiterate | -0.018677 | .0072256 | -2.58 | 0.010 |
| Low schooling | -0.0040491 | .0033848 | -1.20 | 0.232 |
| Middle schooling | -0.0000526 | .0013265 | -0.04 | 0.968 |
| Number of children | -0.0303848 | .006738 | -4.51 | 0.000 |
| Number of children preschool | 0.0006579 | .0036196 | 0.18 | 0.856 |
| Number of children teen | 0.0096593 | .003308 | 2.92 | 0.004 |
| Age | -0.0148242 | .029071 | -0.51 | 0.610 |
| Age squared | 0.0767524 | .0140163 | 5.48 | 0.000 |
| Wage | -0.0187315 | .0021085 | -8.88 | 0.000 |
| Income | 0.0142935 | .0026286 | 5.44 | 0.000 |
| Rural_dummy | -0.0034477 | .0010925 | -3.16 | 0.002 |
| Region_Tigray | 0.0037581 | .0003434 | 10.94 | 0.000 |
| Region_Oromia | -0.0110464 | .0016893 | -6.54 | 0.000 |
| Region_Somali | 0.0011967 | .0001653 | 7.24 | 0.000 |
| Region_Benishangule-Gumuz | 0.0009373 | .0000899 | 10.42 | 0.000 |
| Region_Gambela | 0.000444 | .0000445 | 9.97 | 0.000 |
| Region_Harari | -0.0001711 | .0000239 | -7.17 | 0.000 |
| Energy_animal dung | -0.0023683 | .0005732 | -4.13 | 0.000 |
| Water_other | 0.0037915 | .0010717 | 3.54 | 0.000 |
| Number of observations = 24711 | F(19, 24692) = 79.79 | | Prob > F = 0.0000 | |
| Log pseudo likelihood = -1.624e+08 | Pseudo R ² = 0.0060 | | | |

6.7.3.2. Determinants of Time Allocation of Boys and Girls: None Productive Activity Time

Table 7-8 presents the results of the determinants of time allocation to nonproductive activities for boys and girls. The coefficients of all education variables are negatively related to nonproductive time allocation and statistically significant. In particular, illiterate boys and girls are likely to allocate less time for nonproductive activities.

The coefficient of rural dummy is positive and statistical significant, indicating that boys and girls residing in rural areas are likely to allocate more time to nonproductive activities compared with those in urban areas. Note that boys and girls in rural areas are time poor compared with their urban counterparts. In addition, the coefficients of regional dummies are negative and statistically significant. This suggests that boys and girls in different regions allocate less time to nonproductive activities compared with those in Addis Ababa.

Most of the infrastructural facilities coefficients are statistically insignificant. The only exceptions are other energy sources and water from other sources; both are negatively correlated with nonproductive time allocation.

Table 6-26: Determinants of time allocation of Boys and Girls (marginal effects): None Productive Activity Time

| Determined – None Productive Time Determinants | Coefficient | Delta-Method | | |
|---|--------------------------------|-------------------|-------|---------|
| | | SD | Z | P-Value |
| Illiterate | -0.0514374 | .0118724 | -4.33 | 0.000 |
| Low schooling | -0.1668624 | .0533874 | -3.13 | 0.002 |
| Middle schooling | -0.023109 | .0092899 | -2.49 | 0.013 |
| Rural_dummy | 0.003121 | .0012862 | 2.43 | 0.015 |
| Region_Tigray | -0.0049499 | .0012032 | -4.11 | 0.000 |
| Region_Afar | -0.0013348 | .0002938 | -4.54 | 0.000 |
| Region_Amhara | -0.0218857 | .0053822 | -4.07 | 0.000 |
| Region_Oromia | -0.0517387 | .0090951 | -5.69 | 0.000 |
| Region_Somali | -0.0016062 | .0004927 | -3.26 | 0.001 |
| Region_Benishangule- Gumuz | -0.0004737 | .0002173 | -2.18 | 0.029 |
| Region_SNNPR | -0.022476 | .0051055 | -4.40 | 0.000 |
| Region_Gambela | -0.0002971 | .0001067 | -2.78 | 0.005 |
| Region_Harari | -0.0002134 | .0000388 | -5.50 | 0.000 |
| Region_Dire Dawa | -0.0003021 | .0000631 | -4.79 | 0.000 |
| Facilities | | | | |
| Energy_wood | -0.0040164 | .0188662 | -0.21 | 0.831 |
| Energy_animal dung | -0.0011367 | .0024215 | -0.47 | 0.639 |
| Energy_charcoal | -0.0001394 | .0004698 | -0.30 | 0.767 |
| Energy_other | -0.0004596 | .0001657 | -2.77 | 0.006 |
| Number of observations = 8481 | F(23, 8458) = 62.55 | Prob > F = 0.0000 | | |
| Log pseudo likelihood = -61728952 | Pseudo R ² = 0.0150 | | | |

6.7.4. Correlates of Time Poverty: Probit Results

We run a probit regression to explain the probability of being time poor as a function of personal, individual, household and location variables. The analysis is again carried out at the individual level, that is, each individual is classified as time poor or not depending on his or her own individual total time worked. The marginal (rather than the coefficients) results are reported and it is computed at the mean of regressors.¹

6.7.4.1. Determinants of Time Poverty of Married Person

The p-values of the age and square age, some regional dummies, and facility variables (e.g. energy and water) as good as time to fetch water show that they are all statistically significant. The negative marginal effect that was estimated about age reveals that the probability of a married person to be time-poor increases as an individual is younger and diminishing as he or she gets older. This means that the time poverty trajectory throughout one's life turn out to get the shape of an Inverted-U and that time poverty tends to diminish after a certain age.

The fact of a married person dependent on wood and animal dung as a source of energy increases the chances of being time-poor. For instance, the likelihood of being time-poor increases with distance to fetch water. On the other hand, improved infrastructure facilities such as access to pipe water and water good

¹ For dummy variables, the marginal effect represents the change in probability when the dummy variable changes from 0 to 1.

reduces the chances of a married person being time-poor as these shorten the time required to fetch water.

There are also geographical differences in the probability of being time poor according to Ethiopia's regions. The positive (negative) regional dummies indicates that the propensity of being time-poor increases (declines) for those who reside in other regions in comparison to those living in Addis Ababa. For example, the probability of a married person to be time-poor is lower for people living in Afar compared with those in Addis Ababa.

A separate regression was estimated for married men and women, and the determinants of time poverty are similar to the joint regression results.

Table 6-27: Determinants of time poverty of married person (marginal effects)

| Determined – Time Poverty Determinants | Coefficient | Delta-Method | | |
|---|-------------|-------------------------------------|--------|----------------------------------|
| | | SD | Z | P-Value |
| Illiterate | 0.079 | 0.171 | 0.470 | 0.642 |
| Low schooling | 0.006 | 0.061 | 0.100 | 0.923 |
| Middle schooling | -0.002 | 0.011 | -0.210 | 0.836 |
| Children | 0.064 | 0.079 | 0.810 | 0.417 |
| Age | -0.848 | 0.217 | -3.920 | 0.000 |
| Age squared | 0.333 | 0.118 | 2.830 | 0.005 |
| Income | 0.014 | 0.014 | 0.980 | 0.327 |
| Rural_dummy | -0.004 | 0.003 | -1.440 | 0.150 |
| Region_Tigray | -0.030 | 0.023 | -1.300 | 0.193 |
| Region_Afar | -0.021 | 0.009 | -2.230 | 0.026 |
| Region_Amhara | -0.074 | 0.089 | -0.830 | 0.405 |
| Region_Oromia | -0.177 | 0.136 | -1.300 | 0.193 |
| Region_Somali | -0.016 | 0.012 | -1.350 | 0.178 |
| Region_Benishangule-Gumuz | -0.002 | 0.002 | -1.460 | 0.143 |
| Region_SNNPR | -0.047 | 0.049 | -0.970 | 0.331 |
| Region_Gambela | -0.003 | 0.001 | -2.770 | 0.006 |
| Region_Harari | -0.001 | 0.001 | -1.560 | 0.118 |
| Region_Dire Dawa | -0.002 | 0.001 | -1.320 | 0.187 |
| Energy_wood | 0.869 | 0.502 | 1.730 | 0.083 |
| Energy_animal dung | 0.094 | 0.057 | 1.650 | 0.098 |
| Water_piped | -0.012 | 0.009 | -1.340 | 0.182 |
| Water_good | -0.067 | 0.016 | -4.190 | 0.000 |
| Time_h_collect_wood | 0.016 | 0.022 | 0.750 | 0.455 |
| Time_h_fetch_water | 0.035 | 0.018 | 1.950 | 0.051 |
| Number of observations = 9465 | | Wald chi ² (24) = 171.20 | | Prob > chi ² = 0.0000 |
| Log pseudo likelihood = -6857885.5 | | Pseudo R ² = 0.0136 | | |

6.7.4.2. Determinants of Time Poverty of Boys and Girls

The main correlates of time poverty for boys and girls include education, wage, income, infrastructural facilities. The probability of being time poor is higher for illiterate boys and girls and increases with wages. As for the latter, higher wages mean that boys and girls tend to spend more time working either in the field or elsewhere. However, as income increases the chances of being time-poor diminishes as people tend to enjoy more leisure. Similar to adults or married persons, access to infrastructure reduces the likelihood of being time poor for boy and girls. In rural areas, boys and girls often bear the burden for fuelwood collection and water fetching.

Table 6-28: Determinants of time poverty of boys and girls (marginal effects)

| Determined – Time Poverty Determinants | Coefficient | Delta-Method | | |
|---|-------------|-------------------------------------|--------|----------------------------------|
| | | SD | Z | P-Value |
| Illiterate | 0.154 | 0.023 | 6.660 | 0.000 |
| Low schooling | 0.087 | 0.066 | 1.310 | 0.191 |
| Age | -1.010 | 2.114 | -0.480 | 0.633 |
| Age squared | 0.868 | 1.078 | 0.810 | 0.421 |
| Wage | 0.262 | 0.040 | 6.490 | 0.000 |
| Income | -0.223 | 0.038 | -5.910 | 0.000 |
| Rural_dummy | 0.001 | 0.005 | 0.260 | 0.795 |
| Region_Tigray | -0.013 | 0.009 | -1.490 | 0.135 |
| Region_Afar | -0.010 | 0.004 | -2.430 | 0.015 |
| Region_Amhara | -0.042 | 0.036 | -1.170 | 0.242 |
| Region_Oromia | -0.075 | 0.055 | -1.360 | 0.174 |
| Region_Somali | 0.000 | 0.005 | 0.040 | 0.966 |
| Region_Benishangule- Gumuz | -0.002 | 0.001 | -2.750 | 0.006 |
| Region_SNNPR | -0.025 | 0.023 | -1.070 | 0.287 |
| Region_Gambela | -0.001 | 0.001 | -2.280 | 0.023 |
| Region_Harari | 0.000 | 0.000 | -0.150 | 0.878 |
| Energy_wood | 0.083 | 0.070 | 1.170 | 0.240 |
| Water_piped | -0.031 | 0.016 | -1.960 | 0.050 |
| Water_good | -0.105 | 0.031 | -3.440 | 0.001 |
| Time_h_collect_wood | 0.000 | 0.041 | 0.000 | 0.999 |
| Time_h_fetch_water | -0.024 | 0.031 | -0.780 | 0.434 |
| Number of observations = 9465 | | Wald chi ² (24) = 171.20 | | Prob > chi ² = 0.0000 |
| Log pseudo likelihood = -6857885.5 | | Pseudo R ² = 0.0136 | | |

A separate probit regression was conducted to assess the correlates of time poverty for boys (Table 7-11). Regarding the marginal effects of education, the results show that the probability of time poor is higher for illiterate boys, i.e. illiteracy increases the chances of being time poor. This implies that boys with some level of education have more skills and are therefore more productive, i.e. they accomplish their activities in less time thus leaving more available time for leisure.

While the probability of being time poor increases with wages, it declines with income levels as the latter allows boys to enjoy leisure. However, higher wages put pressure on boys to spend long hours working by substituting leisure for work thereby increasing the likelihood of being time poor.

Among the infrastructural facilities, access to water good is negatively correlated with the probability of time poor. Such results are intuitively sensible given that improved access to water drinking or other purposes shortens the time required for boys to fetch water.

Table 6-29: Determinants of time poverty of boys (marginal effects)

| Determined – Time Poverty Determinants | Coefficient | Delta-Method | | |
|---|-------------|-------------------------------------|--------|----------------------------------|
| | | SD | Z | P-Value |
| Illiterate | 0.142 | 0.031 | 4.570 | 0.000 |
| Low schooling | 0.019 | 0.092 | 0.210 | 0.837 |
| Age | -1.518 | 2.927 | -0.520 | 0.604 |
| Age squared | 1.106 | 1.497 | 0.740 | 0.460 |
| Wage | 0.289 | 0.062 | 4.670 | 0.000 |
| Income | -0.229 | 0.054 | -4.270 | 0.000 |
| Rural_dummy | -0.005 | 0.007 | -0.740 | 0.461 |
| Region_Tigray | -0.009 | 0.007 | -1.360 | 0.174 |
| Region_Afar | -0.003 | 0.004 | -0.830 | 0.407 |
| Region_Amhara | -0.071 | 0.041 | -1.720 | 0.085 |
| Region_Oromia | 0.003 | 0.004 | 0.580 | 0.563 |
| Region_Somali | -0.033 | 0.018 | -1.900 | 0.058 |
| Region_SNNPR | -0.001 | 0.001 | -1.670 | 0.094 |
| Region_Gambela | 0.000 | 0.000 | 0.700 | 0.481 |
| Region_Harari | -0.001 | 0.001 | -1.230 | 0.220 |
| Energy_wood | 0.039 | 0.095 | 0.410 | 0.683 |
| Water_piped | -0.010 | 0.021 | -0.450 | 0.651 |
| Water_good | -0.107 | 0.041 | -2.610 | 0.009 |
| Time_h_collect_wood | -0.018 | 0.057 | -0.310 | 0.758 |
| Time_h_fetch_water | -0.013 | 0.042 | -0.320 | 0.750 |
| Number of observations = 1486 | | Wald chi ² (24) = 118.83 | | Prob > chi ² = 0.0000 |
| Log pseudo likelihood = -1068122.2 | | Pseudo R ² = 0.1035 | | |

Table 7-12 presents a separate probit regression of the correlates of time poverty for girls. The results are similar to boys.

The probability of time poor is higher for illiterate girls and those with low schooling, i.e. illiteracy and lower levels of education increases the chances of being time poor. Similar to boys, girls with some level of education have more skills and are therefore more productive, i.e. they accomplish their activities in less time thus leaving more time for leisure.

Both substitution and income effects work. While the probability of being time poor increases with wages, it declines with income levels as the latter allows girls to enjoy leisure. However, higher wages put pressure on girls to work long hours by substituting leisure for work thereby increasing the likelihood of being time poor. At higher wages, girls are likely to avail more time for work and less time for leisure.

Two infrastructural facilities worth discussing. Access to water good and piped water are negatively correlated with the probability of time poor. Such results are sensible given that improved access to water drinking or other purposes shortens the time required for girls to fetch water as girls, especially in rural areas are responsible for fetching water. Improved access to water is statistically lessens the likelihood of being time poor.

Table 6-30: Determinants of time poverty of girls (marginal effects)

| Determined – Time Poverty Determinants | Coefficient | Delta-Method | | |
|---|-------------|---|--------|---|
| | | SD | Z | P-Value |
| Illiterate | 0.167 | 0.035 | 4.770 | 0.000 |
| Low schooling | 0.163 | 0.097 | 1.680 | 0.092 |
| Age | -0.734 | 3.062 | -0.240 | 0.811 |
| Age squared | 0.792 | 1.558 | 0.510 | 0.611 |
| Wage | 0.232 | 0.049 | 4.780 | 0.000 |
| Income | -0.212 | 0.052 | -4.060 | 0.000 |
| Rural_dummy | 0.008 | 0.007 | 1.120 | 0.262 |
| Region_Tigray | 0.005 | 0.008 | 0.580 | 0.559 |
| Region_Afar | -0.008 | 0.004 | -2.030 | 0.042 |
| Region_Amhara | 0.060 | 0.039 | 1.560 | 0.119 |
| Region_Oromia | 0.008 | 0.004 | 1.880 | 0.060 |
| Region_Somali | 0.050 | 0.020 | 2.560 | 0.010 |
| Region_SNNPR | -0.001 | 0.001 | -0.960 | 0.339 |
| Region_Gambela | 0.000 | 0.000 | 0.680 | 0.495 |
| Region_Harari | 0.002 | 0.001 | 3.060 | 0.002 |
| Energy_wood | 0.148 | 0.108 | 1.370 | 0.171 |
| Water_piped | -0.060 | 0.023 | -2.560 | 0.011 |
| Water_good | -0.099 | 0.045 | -2.170 | 0.030 |
| Time_h_collect_wood | 0.014 | 0.059 | 0.240 | 0.810 |
| Time_h_fetch_water | -0.037 | 0.047 | -0.790 | 0.431 |
| Number of observations = 1352 | | Wald chi² (24) = 105.14 | | Prob > chi² = 0.0000 |
| Log pseudo likelihood = -955162.97 | | Pseudo R² = 0.0864 | | |

7. Conclusions and Recommendations

7.1. Conclusions

The main objective of this study was to estimate the time poverty in Ethiopia and analyze the factors that influence time allocation to different activities. The data used for the study is the time use survey conducted by the Central Statistical Agency (CSA) in 2013. This report analyzes good-being on an individual level through the allocation of time or work hours done by different segments of the society including adults and children. In doing so, the Foster, Greer and Thorbecke (FGT) framework has been adapted into a time poverty mode. In addition, econometric models were employed to identify the relative importance of factors influencing time allocation in both rural and urban areas.

Following Badasi and Wodon (2006), we define two-time poverty bounds: (i) Lower threshold poverty line as a mean work time in minutes plus a quarter of mean leisure; and (ii) Upper threshold poverty line as mean work time in minutes plus half of the mean leisure time.

Based on the lower time poverty line as a reference, about 43.4% of individuals are time poor, and there is no significance difference between males and females in terms of the headcount time poverty indicator. Similarly, the average time poverty gap is also nearly the same for males and females. However, the severity of the time poverty is slightly higher for males than females. Overall, the results indicate time poverty varies by age, gender, location, education, religion, and marital status. The incidence of time poverty is higher in rural areas, while poverty gap and severity are higher in urban areas.

Comparing the time poverty of rural and urban women, rural women are more time poor than the urban women: rural women are relatively time poor (45.3%) compared with urban women (37.2%). Both time poverty gap and severity are also higher for rural women compared with urban women. This could attribute to a relatively developed infrastructure in urban areas which would ease time-consuming activities for urban women. As noted above, urban men are time poor than rural men which could also be related to sharing responsibilities, i.e. urban men could share the burden of urban women. In terms of regional variation, the highest shares of time poor are observed in Addis Ababa (50.7%) and Somali (49.6%). Gambela witnessed the lowest in terms of the share time poor individuals (32.2%).

The time poverty of boys and girls is expected to be different from adult males and females. About 41.27% of boys and girls are time poor, higher than that of adults. On average, about 43.55% of boys are found to be time poor, compared with 38.8% of the girls. Location and the level of education matter for time poverty of boys and girls. Rural boys and girls are time poor than urban boys and girls. The time poverty gap and severity are also considerably higher for the rural boys and girls. Comparing the rural and urban boys, similar trends are observed, i.e. rural boys are time poorer than their urban counterparts.

Dependence on wood and animal dung as a source of energy increases the chances of being time-poor for married person. Infrastructural facilities are also correlated with time poverty of boys and girls. Access to water good and piped water are negatively correlated with the probability of time poor for girls. Such results are sensible given that improved access to water drinking or other purposes shortens the time required for girls to fetch water as girls, especially in rural areas are responsible for fetching water. For boys, water good is negatively correlated with time poverty and is statistically significant. Overall, improved access to water is statistically lessens the likelihood of being time poor for both boys and girls.

7.2. Recommendations

In light of the above findings, the following recommendations are made, especially to improve the contribution of the non-market activities to the Ethiopian economy.

▪ Recognize the problem: Awareness creation

Given that there is a huge cost to the society in terms of high time poverty, it is recommended that continuous awareness creation needs to be done at all levels. Balancing the amount of time spent on unpaid work between men and women could reduce the work load of women and allow more women to enter the workforce.

▪ Accounting for non-market activities

The time use analysis shows that in rural Ethiopia women disproportionately suffer from time poverty because they systematically add up domestic and care duties (reproductive work) to their market or non-market productive work so that this double time-budget makes of time a resource which is more scarce for women than for men. However, these tasks are not accounted in national accounts and thus, remain invisible in the economy. It is recommended that there is a need to expand the national income accounting to take into account non-market activities.

▪ Improving M&E

There is a need to establish transparent and robust methods of monitoring and evaluation of non-market activities. In light of this, it is crucial to design a consistent, comprehensive and clear monitoring and evaluation mechanisms for adequate measurement, reporting and feedback mechanisms for non-market activities. It is also recommended to develop relevant indicators for tracking the contributions of non-market activities to the national economy.

▪ Improve statistics

It is recommended to strengthen domestic statistical capacity in collecting relevant information and data on non-market activities, i.e. information on non-market activities need to be mainstreamed into the regular data collection systems.

▪ Access to improved technologies

It is recommended to improve access to modern energy, especially in rural areas. In particular, efficient improved cooking technologies (e.g. improved cook stoves) have multiple benefits including improve health, reduce air pollution, and more time for boys and girls for study. For example, affordable energy in the home could mean people, especially women have access to ovens instead of having to take the time to chop firewood. This will also save time for boys and girls and focus on their education. Energy policy and investment priorities need to focus on alternative energy sources, and to address the domestic energy needs of households, focused on domestic requirements (notably for cooking fuel). Expanding labor-saving domestic technology relating to food processing has the potential to raise labor productivity and save time.

The time spent on unpaid work can be reduced through improved technologies. In rural areas, it is recommended to improve access to agricultural technologies such as improved seeds that are drought- or pest-resistant which could reduce the time spent in the field.

▪ **Other infrastructure**

Lack of market substitutes, basic social services and infrastructure are some of the factors that restrict subsistence households to family labor processes. This suggests that there is a need to expand improved infrastructural facilities including improved water services and transport services to reduce time poverty of women and children, particularly in the context of Ethiopia. In particular, improved access to water would reduce the time poverty by relieving some overload for adults, boys and girls.

Improved access to education would be another area of intervention to reduce time poverty, especially for boys and girls. This implies that education helps individuals to accomplish their activities in less time thus leaving more available time for leisure, i.e. education increases productivities of individuals.

▪ **Targeted interventions for greater impact**

Given that time poverty has a special dimension, this requires designing interventions that take into account the economic, social and environmental characteristics of regions, i.e. 'one-size-fit all' does not work. For instance, boys and girls are time poor particularly in the pastoralist regions of the country such as Afar and Somali due to the nature of livelihoods as children look after livestock. In the pastoral areas, access to mobile schools could help reduce the proportion of time poor boys and girls. In addition, improve irrigation facilities and provision of improved livestock breeds could help improve livestock productivity, thereby reducing time poverty of pastoralists.

Annex

Division of Activity Classification

Within the frame of International Classification of Activities for Time-Use Statistics (ICATUS), there are a number of major divisions of the activity classification in the wide range of literature important for tabulation plan and Generation of Variable of interest. Depending on the objective of our research, the major divisions of the activity classification will consider (i) Geographical variations – Rural Vs Urban, (ii) Gender or/and Age disparities – Married Female Vs Married, Male and Boys Vs Girls, (iii) the SNA framework – SNA work, Non SNA work and Non-productive work and (iv) Other classifications important to Gender mainstreaming - Paid work Vs Unpaid work and market work Vs House work.

Based on the above considerations, the Ethiopian Time Use Survey (ETUS) can be categorized as follows:

1. Work

1.1 Market work: time of work allotted in "output that is sold at prices that are economically significant or otherwise disposed of on the market, or intended for sale or disposal on the market". It covers full-time and part-time jobs, unpaid work in family business/farm, breaks in the workplace and time spent looking for work. This include:

Formal Employment: Time spent in formal work and related

- 111 Working time in "formal sector" employment
- 112 Other breaks while in working time in "formal sector"
- 130 Travel related to work in the "formal sector"
- 120 Looking for work/setting up business in the "formal sector"

Primary Production Activities: Time spent in Primary Production Activities of households and related

- 211 Working time in primary production activities of farming/business
- 212 Acquiring inputs/supplies and disposing of outputs used for primary production activities
- 220 Looking for work/setting up business in primary production activities
- 230 Travel related to primary production activities of households

Secondary Production Activities: Time spent in Non-Primary Production Activities of households and related and Time spent in working time in construction activities of household production and related

- 311 Working time in non-primary production activities (processing) of farming/business
- 312 Acquiring inputs/supplies and disposing of outputs in non-primary production activities
- 320 Looking for work/setting up business in non-primary production activities
- 330 Travel related to non-primary production of household
- 411 Working time in construction activities
- 412 Acquiring inputs/supplies for construction activities for household production
- 420 Looking for work/setting up business in construction activities in household enterprise
- 430 Travel related to construction activities of households

Trade, Business and Services: Time spent in work for household providing services for income and related.

- 511 Food vending and trading
- 515 Transporting goods and passengers
- 516 Paid domestic services
- 517 Meetings/training and studies

520 Looking for work/setting up business in service activities in household enterprise

530 Travel related to providing services for income

1.2 Home (Non-market) Work - time of work allotted in production of output for own final use by household. Home-work includes activities done by people to maintain their households like routine household work (e.g. cooking, cleaning, and gardening), volunteering, and shopping. This includes:

Unpaid domestic services: time spent in producing domestic services for own final use within household

6111 Food management

6112 Cleaning and upkeep of dwelling and surroundings

6113 Do-it-yourself decoration, maintenance and small repairs

6114 Care of textiles and footwear

6115 Household management

6116 Pet care

Shopping: time spent in purchasing consumer goods, professional and personal care services, household services, and government services

6121 Shopping for/purchasing of goods and related activities

6122 Shopping for/availling of services and related activities

6200 Travel related to provision of unpaid domestic services

2. Non-Work – explicitly these are also non market

caregiving services: This covers time spent doing activities to care for or help any child or adult in the household, regardless of relationship to the respondent or the physical or mental health status of the person being helped and volunteer services to other households, community, non-profit institutions serving households (NPISH). This includes:

Childcare: time spent in caring for and helping children (household members)

7111 Caring for children/physical care

7112 Teaching, training, helping children

7113 Accompanying children to places

7114 Minding children (passive care)

Adult care: time spent in caring for and helping elders (household members)

7121 Caring for adults/physical care

7122 Caring for adults/emotional support

7123 Accompanying adults to places

7131 Working time providing unpaid caregiving services to household members n.f.d.

7200 Travel related to unpaid caregiving services to household members

7900 Providing unpaid caregiving services to household members n.e.c

Other caregiving services: Caring for and helping non household members

811 Unpaid help to other households

813 Organized unpaid volunteer services

Learning: This covers time spent taking classes for a degree or for personal interest (including taking Internet or other distance-learning courses), time spent doing research and homework, and time spent taking care of administrative tasks related to education (such as registering for classes or obtaining a school ID) are included in this category. For high school students, before- and after-school extracurricular activities (except sports) also are classified as educational activities. Specifically includes:

Personal Care: "Personal care" covers sleep, eating and drinking, and other household, medical, and personal services (hygiene, grooming, visits to the doctor, etc.). Receiving unpaid personal care from others also is captured in this category. This Include:

- 1511 Sleep and related activities
- 1512 Eating and drinking
- 1513 Personal hygiene and care
- 1514 Receiving personal and health/medical care from others
- 1515 Religious activities
- 1516 Activities associated with resting, relaxing

Leisure: this includes time spent in sports, exercise, and recreation; socializing and communicating; attending cultural events, religious activities and civic obligations and other leisure activities like include watching television; reading; relaxing or thinking; playing computer, board, or card games; using a computer or the Internet for personal interest; playing or listening to music; and other as unspecified time use. This includes:

- 1011 Socializing and communication
- 1012 Participating in community cultural/social events
- 1111 Attendance at organized/mass cultural events
- 1112 Attendance at parks/gardens, shows
- 1113 Attendance at sports events and related
- 1211 Visual, literary and performing arts (as hobby) and related courses
- 12131 Solo games
- 1311 Participating in sports
- 1312 Camping and other outdoor activities
- 1411 Reading
- 1412 Watching/listening to television and video
- 1414 Using computer technology

With the prime objective of providing weightage to SNA activities in gender mainstreaming, the major division of activity classification of ETUS can be further categorized using the SNA framework and AS-framework as:

A. SNA work activities:

- P1 - Formal employment or work in "formal enterprises"
- P2 - Production of goods by households for income or for own final use
- P3 - Paid construction activities and construction for own capital formation
- P4 - Providing services for income, including employment in the informal sector

B. Non-SNA" work activities:

- P5 - Providing unpaid services for own final use
 - Domestic services for own final use within household
 - Unpaid caregiving services to household members
- P6 - Providing unpaid domestic services, caregiving services and volunteer services to other households, community, non-profit institutions serving households

C. Non – Productive work activities

Learning

Socializing and community participation.
Attending/visiting cultural, entertainment and sports events/venues.
Engaging in hobbies, games and other pastime activities.
Indoor and outdoor sports participation.
Use of mass media.
Personal care and maintenance

Paid Work Vs Unpaid work: To get the due importance of neglected Economic activities which are usually performed by women at home, the Paid/Unpaid activity classification is also adopted. A conceptual variable "do activity for payment" provides the required information on paid and unpaid SNA work conducted.

Other Categorization

For the better handling gender mainstreaming in time use the whole data set is viewed with respect to the following divisions:

Urban Vs Rural dwellers: the severity of biased time allocation is assumed to be higher in rural areas compared to urban.

Married Women Vs Married Men – as the time allocation in Ethiopia is severely biased after marriage. Please note that women/Men who are divorced, separated or widowed are assumed to have same characteristics as married in terms of time allocation.

Boys Vs Girls – Irrespective of their marital status (assigned never married in the data set) teen agers (10 to 17 years old inclusive) are assumed to have differences in time use in their household.

Education - education is also another important parameter that need to be considered while dealing with time use

Illiterate: people who do not have formal education
Low schooling: less than or equal to 6 years of schooling
Middle schooling: (6, 12] years of schooling
Top schooling: higher than 12 years of schooling

Days of work: As the dairy is based on representative day, we need to separate who do when to make comparison among groups of interest.

Weekdays: activities performed from Mondays to Fridays
Weekends: activities performed on Saturdays and Sundays

Considering the above grouping of interest the following tabulation and data generation plan are proposed (consulting our analysis framework):

Variable Generation Plan: taking each HH member as unit of analysis, we will generate the following variables (separate for Rural and Urban dwellers).

- Education level of each married wo/men, boys and girls categorized as illiterate, low schooling, middle schooling and top schooling
- Age of each married wo/men, boys and girls

- Number of children with in their HH (Pre-school: ages 0-2 years and Ages 2-5 years, Pre-Teen and/or Teen: Ages 5-9 years Ages 10-14 years and Teen: Ages 14-17years)
- Number of work activities performed (by each married Wo/men, boys and girls)
- Number of non-work activities performed (by each married Wo/men, boys and girls)
- Number of paid work activities performed (by each married Wo/men, boys and girls)
- Number of unpaid work activities performed (by each married Wo/men, boys and girls)
- Number of SNA work activities performed (by each married Wo/men, boys and girls)
- Number of non-SNA work activities performed (by each married Wo/men, boys and girls)
- Number of Non – Productive work activities performed (by each married Wo/men, boys and girls)
- Time allotted to market work (by each married Wo/men, boys and girls)
- Time Allotted to non-market work (by each married Wo/men, boys and girls)
- Time Allotted to paid work (by each married Wo/men, boys and girls)
- Time Allotted to unpaid work (by each married Wo/men, boys and girls)
- Time Allotted to caregiving services (by each married Wo/men, boys and girls)
- Time Allotted to Personal Care (by each married Wo/men, boys and girls)
- Time Allotted to Leisure (by each married Wo/men, boys and girls)
- Income of each working member: income is not in the data set. However, can be proxied by expenditure as follows:
 - Convert monthly expenditure of HH to daily (monthly expenditure/30) and equally allocate to members who are involved in Productive work (with the conceptual variable “Did you engaged in any productive work in the last 7 days”-Yes)
- Wage of each working member
 - $[\text{Income} - \text{non labor income}] / \text{Amount of time to market work}$
 - Still non labor income is not known: to proxy it we will deduct expenditure reported (HCE survey, 2010/11) to be sourced from dividends, interest and rent and transfer payments and divide it to 365 to make it daily.

References

- Agenor, P., 2015, "Gender Equality and Economic Growth: An Overlapping Generations Model for India," OECD Working Paper, forthcoming.
- A.G. Adeyonu(2012): Gender Dimensions of Time Allocation of Rural Farming Households in Southwest Nigeria. *Current Research Journal of Social Sciences* 4(4): 269-276, 2012
- Allard, M.D. and M. Janes (2008). Time Use of Working Parents: A Visual Essay. *Monthly Labor Review* 131(6), 3-14.
- Arora, D. and Rada, C. (2014) "Gender Differences in Time and Resource Allocation in Rural Households in Ethiopia," Paper presented at Association for the Study of Generosity in Economics/International Association for Feminist Economics Panel at Allied Social Science Association Meetings, Philadelphia, PA.
- Bardasi, Elena and Quentin Wodon (2006), .Measuring Time Poverty and Analysing Its Determinants: Concepts and Application to Guinea., Chapter 4 in World Bank Working Paper No. 73. World Bank.
- Bardasi, E. and Wodon, Q. (2010) "Working Long Hours and Having No Choice: Time Poverty in Guinea," *Feminist Economics* 16(3): 45-78. doi:10.1080/13545701.2010. 508574.
- Barnett, R.C., K.C. Gareis, and R.T. Brennan (2009). Reconsidering Work Time: a Multivariate Longitudinal Within-Couple Analysis. *Community, Work & Family* 12(1), 105-133.
- Becker, G.S. (1975). *Human Capital* (2nd ed.). New York: Columbia University Press.
- Blackden, & Wodon. (2006). *Gender, Time Use, and Poverty in Sub-Saharan Africa*. Washington DC: The World Bank.
- Charmes, J., 2005. A Review of Empirical Evidence on Time use in Africa from UN-Sponsored Surveys. *Gender Time Use and Poverty in Sub-Saharan, Africa*.
- Chen, Feinian. 2004. "The division of labor between generations of women in rural China", *Social Science Research*, 33, 557-580.
- Chen, Feinian. 2005. "Employment transitions and the household division of labor in China", *Social Forces*, 84, 2, 831-851.
- Coudouel, A., J. Hentschel, and Q. Wodon (2002), "Poverty Measurement and Analysis." In J. Klugman, editor, *A Sourcebook for Poverty Reduction Strategies, Volume 1: Core Techniques and Cross-Cutting Issues*. Washington, D.C.: The World Bank.
- De Brauw, Alan and John Giles. 2008. "Migrant labor markets and the welfare of rural households in the developing world: evidence from China. Policy Research Working Paper Series 4585, World Bank.
- De Brauw, Qiang Li, Chengfang Liu, Scott Rozelle and Linxiu Zhang. 2008."Feminization of agriculture in China? Myths surrounding women's participation in farming", *The China Quarterly*, 12, 327-348.
- Datta Gupta, N., and L. S. Stratton. "Examining the impact of alternative power measures on individual time use in American and Danish couple households." *Review of Economics of the*

Household 8:3 (2010): 325–343.

Dinkelman, T. (2011): the effects of rural electrification on Employment new evidence from south Africa, the American economic review, 101, 3078-3110

Duflo, E., 2012, "Women Empowerment and Economic Development," *Journal of Economic Literature*, Vol. 50, No. 4: pp. 1051-079.

Entwisle, Barbara and Gail E. Henderson (Eds.). 2000. *Re-Drawing Boundaries: Work, Households, and Gender in China*. Berkeley: University of California Press.

Ekert-Jaffé, O. (2011). Are the Real Time Costs of Children Equally Shared by Mothers and Fathers? *Social Indicators Research* 101(2), 243-247.

Fafchamps, M., Kebede, B. and Quisumbing, A. R. (2009) "Intrahousehold Welfare in Rural Ethiopia," *Oxford Bulletin of Economics and Statistics* 71(4): 567–599.

Foster, Greer, & Thorbecke. (1984). A Class of Decomposable Poverty Indices. *Econometrica* 52, :761–766.

Gammage, S. (2010) "Time Pressed and Time Poor: Unpaid Household Work in Guatemala," *Feminist Economics* 16(3): 79–112.

Goldschmidt-Clermont, Luisella and Pagnossin-Aligisakis, Elisabetta (1995) "Measures of unrecorded economic activities in fourteen countries" UNDP, *Background Papers for the Human Development Report*, New York: Oxford UP, 105-155.

Gronau, Reuben and Hamermesh, Daniel, 2001, The Demand for variety: A household production perspective, NBER working paper no. 8509. Cambridge, USA.

Heckman, J. and T. MaCurdy, 1980, "A Life Cycle Model of Female Labor Supply," *Review of Economic Studies*, Vol. 47 (1), pp. 47–74.

Jacobs, J. and K. Gerson (2001). Overworked Individuals or Overworked Families? *Work and Occupations* 28(1), 40-63.

Jaumotte, F., 2003, "Labor Force Participation of Women. Empirical Evidence on the Role of Policy and Other Determinants in OECD Countries," *OECD Economic Study No. 37*, Paris: Organization for Economic Cooperation and Development.

Kabátek, J., A. van Soest, and E. Stancanelli. "Income taxation, labour supply and housework: A discrete choice model for French couples." *Labour* 27 (2014): 30–43.

Lawson, David and David Hulme (2007), .Genuine .Q2.. Methodological Issues Associated with Combining Quantitative and Qualitative Approaches to Understanding Poverty Dynamics: Evidence from Uganda.. Chronic Poverty Working Paper 74, CPRC, University of Manchester.

Ilahi, N. 2000. "The Intra-household Allocation of Time and Tasks: What Have We Learnt from the Empirical Literature?" Policy Research Report on Gender, and Development, Working Paper 13, World Bank, Washington, DC.

- Mancini L and Pasqua S. (2010), Asymmetries and interdependencies in time use between Italian parents, JEL: D1, J13, J22.
- Meeks,R(2014): water works:the economic impact of water infrastructure, university of Michigan
- Milkie, M., S. Raley, and S. Bianchi (2009). Taking on the Second Shift: Time Allocations and Time Pressures of U.S. Parents with Preschoolers. *Social Forces* 88(2), 487-518.
- Mueller, Eva. 1984. "The value and allocation of time in rural Botswana." *Journal of Development Economics*, 15, 1-3, 329-60.
- Nankhuni, F., 2004. Environmental Degradation, Resource Scarcity and Children's Welfare in Malawi: School Attendance, School Progress and Children's Health. *Agricultural Economics and Demography*, Pennsylvania State University, University Park, PA.
- Nankhuni, F., 2004. Environmental Degradation, Resource Scarcity and Children's Welfare in Malawi: School Attendance, School Progress and Children's Health. *Agricultural Economics and Demography*, Pennsylvania State University, University Park, PA.
- Newman, C. (2001) "Gender, Time Use, and Change: The Impact of the Cut Flower Industry in Ecuador," *The World Bank Economic Review* 16(3): 375-395.
- Ngome, A. (2003) "Gender Division of Labour and Women's Decision- Making Power in Rural Households: The Case of Mbalangi, Ediki and Mabonji Villages of Meme Division," PhD thesis, University of Buea, Department of Women and Gender Studies, Cameroon.
- Rania Antonopoulos and Emel Memis(2010): Time and Poverty from a Developing Country Perspective. Levy Economics Institute Annandale-on-Hudson, NY 12504-5000 page 4-25
<http://www.levyinstitute.org>
- Ritchie, A., C. Lloyd, and M. Grant. 2004. "Gender Differences in Time Use Among Adolescents in Developing Countries: Implications of Rising School Enrollment Rates." Working Paper 193, Population Council, Policy Research Division, New York.
- Rizavi S.S. and Sofer C. (2008) "The Division of Labour within the Household: Is There any Escape from Traditional Gender Roles? Working paper, University Paris1.
- Sofer C. (2005) « La croissance de l'activité féminine » in *Femmes, genre et sociétés : l'état des savoirs*. La Découverte, Paris, pp 218-226.
- 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.
- Sow, F. D. (2010): "Intrahousehold Resource Allocation and Good-Being: The Case of Rural Households in Senegal," PhD thesis, Wageningen University.
- Tibajjuka, A. K. (1984) "An Economic Analysis of Smallholder Banana-Coffee Farms in the Kagera Region, Tanzania: Cause of Decline in Productivity and Strategies for Revitalization," PhD thesis, Swedish University of Agricultural Sciences, Uppsala.
- Vickery, C. The Time-Poor: A New Look at Poverty. *Journal of Human Resources*. Volume no 12, p.27-48. 1977.

World Bank, FAO and IFAD, 2008. *Gender in Agriculture Sourcebook*. The International Bank for Reconstruction and Development, Washington.

World Bank (2006), *Gender, Time Use, and Poverty in Sub-Saharan Africa*, World Bank Working Paper No.73.

Zhang, Linzi, Alan de Brauw, and Scott Rozelle. 2004. "China's rural labor market development and its gender implications", *China Economic Review*, 15, 230-247.

