ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
FACULTY OF BUSINESS AND ECONOMICS

FEMALE-HEADED HOUSEHOLDS AND POVERTY IN URBAN ETHIOPIA

BY MERON ASSEFA
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ABSTRACT

The study has tried to examine the extent of poverty and vulnerability of female–headed households by way of making comparisons with their male counterparts in urban Ethiopia. It further looks through the determinants of their welfare and poverty. It is based on the 1999/2000 Household Income, Consumption and Expenditure Survey (HICES) and Welfare Monitoring Survey (WMS) from Central Statistical Authority (CSA). Using the Foster, Greer and Thorbecke (FGT) poverty indices, the descriptive analysis of poverty indices revealed that female-headed households are poorer and more vulnerable to poverty than male-headed households. To further investigate this, micro level regression models (OLS, probit, ordered probit and tobit models) have been estimated. And as to the results, the variable indicating gender suggests that female headship has no significant direct impact on the welfare or poverty level of households. Rather, other variables such as educational attainment of the head, household size (especially higher number of children in a family), location of residence in the region, and to some extent employment status of the head are found to be the key determinants of poverty. However, since FHHs are more illiterate and unemployed with most of them concentrating in informal sector activities, by implication the fact that they are female heads has an impact on the welfare or poverty status of the households indirectly through affecting their level of education and employment status. Hence, there is an evidence to suggest that poverty alleviation programs should use FHHs as proxy variables for targeting the poor. With that, gender-sensitive poverty alleviation policies that enhance endowments such as those that increase education level, employment and ability to control fertility should be the key ingredients of a poverty reduction strategy in the region. Besides, the variable indicating region of residence suggests that for the government to eradicate poverty anti-poverty policy should be drawn on regional basis.

Key Words: Welfare and Poverty, Vulnerability, Female-headed households, Urban Ethiopia, FGT poverty indices, OLS, Probit, Ordered Probit and Tobit models

Chapter One

INTRODUCTION

1.1. General

Poverty is a global concern. Even though it has been especially a major social and economic concern of most developing countries, poverty continues to be a major impediment to human development and economic progress of these countries. An increasing number of people in these countries face unemployment, famine, illiteracy, inadequate shelter, illness and other forms of deprivation, which are the various dimensions of poverty.

The burden of poverty is unevenly spread among the regions of the developing world, among countries within those regions, and among the localities and groups of the society within those countries. In Africa, the problem is severe. Various reports show not only the large extent of poverty but also that this problem increased markedly during the 1980's and 1990's both absolutely and relatively as compared to other developing countries, hence leading to "Africanization of global poverty"(White and Kellick, 2001).

The different economic, social and demographic indicators can express these manifestations of poverty in the continent. One of the indications of this in African context is that even though the proportion of the world's people living in extreme poverty fell from 29% in 1990 to 23% in 1999, the number of people in absolute poverty in Sub-Saharan Africa (SSA) rose from 242 million to 300 million (UNDP: 2002). Or, it could be seen from the data on income poverty since the late 1980's, Africa's share of those living on less than a dollar a day to have risen, and the absolute

number of the poor has grown five times more than the figure for Latin America, and twice that for South Asia (White and Kellick: 2001).

Such facts are even worse in Ethiopia. The country is one of the poorest in the world, and it is among the bottom of the developing countries. It is ranked 168th out of 173 and 87th out of 88 developing countries in terms of human development and human poverty indices respectively (UNDP: 2002). Also using the various socio-economic indicators, one can see quite a sizeable percentage of the population lives in abject poverty.

To alleviate the situation, the government of Ethiopia has designed a 'Poverty Reduction Strategy Paper' (PRSP). According to MoFED (2002a), the overall objective of this strategy is to reduce poverty through enhancing rapid economic growth while at the same time maintaining macroeconomic stability. Poverty head count ratio is projected to decline by about 10% by the end of the PRSP period (2004/2005) from its 1999/00 level of 44%. In light of this, it is stated that the government is committed to work towards meeting the Millennium Development Goals (MDGs) of 2015. And achieving such MDGs requires the Ethiopian economy to grow in real terms by 5.7% per annum until 2015 to reduce poverty by half from its current level.

However, the most important question is how the government is going to achieve that goal. This could not be adequately addressed unless we have information on the characteristics of the poor and how these characteristics determine poverty. On this background, addressing the issue in terms of exploring the causes and examining ways of alleviating such problem is important. This can be done at macro level or concentrate on particular areas or groups of the society. However, for the fact that poverty is ultimately a problem at an individual or household level, micro-level

studies on poverty are appropriate (Coulmbe and McKay: 1993). With this context, the study will focus on female-headed household and poverty in urban areas.

1.2. Problem Statement

The extent of poverty appears differently among the various groups of a society. It affects people of different characteristics in different ways for they have different roles, needs and constraints. A great majority of women in the world today, mostly in developing countries, live in poverty. As it has frequently been asserted, women constituted about 70% of the world's poverty stricken population (Quisumbing, et al: 2001). Many researches on women and development have also consistently shown that women in general, and female-headed households in particular are poor. Although most poor women can also be found in households headed by a man, the poorest women are in female-headed households (UNFPA: 2002).

The core dimensions of poverty, which are opportunity, capability, security/risk, and empowerment, differ along gender lines and function to heighten the vulnerability of women (MoFED: 2002a). According to Cagatay (1998), women are poorer in most societies in many dimensions of capabilities such as education and health. Resource allocation within households is often biased against women (or girls). It is more difficult for women to transform their capabilities into incomes or well-being. Gender inequalities in the distribution of income, access to productive inputs such as credit, command over property or control over earned income, as well as gender biases in labor markets and social exclusion that women experience in a variety of economic and political institutions are the main causes for the greater vulnerability of women to chronic poverty. Within different cultures and levels of economic development, women tend to

specialize in unpaid reproductive or caring labor compared to men. Although time is claimed to be poor's most abundant asset, women are relatively time poor (Cagatay: 1998).

Such facts underpin the phenomena popularly known as the "feminization of poverty", which argues that women, especially those in developing countries, appear to bear an unequal share of the burden of poverty. This is to mean women (or women-headed households) suffer more than men (or male-headed households) from poverty (Quisumbing, et al: 2001).

This idea has become popular, both in terms of defining and shaping the analyses of poverty and poverty alleviation strategies. Thus, targeting women has become one vehicle for gender-sensitive poverty alleviation. Poor women have become the explicit focus of policymaking, for example, in the areas of micro credit programs and income generation activities (Cagatay: 1998). Although female-headed households have been singled out in efforts that have been operationalised to address the problem of poverty, the relationship between gender and poverty has been one of the issues that are controversial (Cagatay: 1998). And to this end, the universal validity of the feminization of poverty is being empirically challenged. At the same time, despite the on-going interventions and continuous efforts over the past decades, women have become steadily poorer, and they proved to be the poorest of the poor. This has great implication on how one addresses the issue by pointing out the gender dimension of poverty. It further poses a new question on the adequacy and the appropriateness of the focus of poverty eradication efforts to address the magnitude of the problem.

As poverty in general in Ethiopia is no different than any other developing country, it also has the same picture with regard to women. Just like many developing countries, Ethiopia testifies to

the fact that poverty has important gender dimensions and women are experiencing poverty differently and disproportionately. With the increasing poverty boundary in the country, the number of women in the trap increases disproportionately.

This fact seems to be incorporated and emphasized by the government development strategies and the PRSP in the country. It has been recognized that where the burden of poverty is disproportionately borne by women, gender-neutral development interventions affect men and women differently. To its credit, the government has manifested its commitment to the equitable socioeconomic development of women by announcing the national policy on women in 1993 (the women's policy). Among other things, women's policy aims to encourage equal economic participation in the country and outline government's strategy for addressing existing economic and social constraints. To this end, the strategy focuses in creating appropriate structures in government institutions so that public policies and interventions are gender sensitive and can ensure equitable development for all Ethiopians (WAO and WB: 1998). And this seems also to be reflected in the process of developing PRSP in the country. According to MoFED (2002a), the government of Ethiopia is committed to eradicate poverty, particularly addressing its gender dimension.

Given the aforementioned arguments, while analyzing the extent, intensity and profoundness of the problem, studies on women and poverty would be relevant in terms of understanding the characteristics and the causes of women's poverty as well as how such factors differ between women and men. Such kinds of empirical analysis would provide a basis for evaluating the government's poverty reduction strategies and policies. This may also help identify other factors

that have not been explicitly addressed in the current strategy. Thus, this study by focusing on female-headed households will try to look into poverty related issues regarding women.

However, poverty assessments, identifying who is poor, who is not, and the characteristics of those who are, is not enough for structuring poverty alleviation policies. "Poverty is a stochastic phenomenon." (Chaudhuri et al: 2001). Policy analysts focusing attention on the current poor may overlook important segments of the population who, while not currently impoverished, are however susceptible to poverty. Those people who are currently not poor may fall below the poverty line, and it is also possible for people who are currently poor to escape from poverty. Therefore, appropriate anti-poverty policy interventions need to look at not just who is poor today, but also who is likely to be poor in the future. This leads us to the concept of 'vulnerability to poverty', which is the risk that a household would become poor in the near future (Suryahadi and Sumarto, 2001). In this regard, the study would look into the vulnerability of female-headed households to poverty and try to examine the household's characteristics, which are likely to be associated with vulnerability.

The focus of this study is in urban areas for some obvious reasons. Female-headship is dominant in urban areas than in rural Ethiopia. Of the 26% of female-headed households in the country, 41% and 23% of them are in urban and rural areas respectively (MOFED: 2002a). According to MoFED (2002b), the incidence of poverty is higher in rural than in urban areas with poverty head count ratio of 45.4% and 36.9 %, respectively. However, as compared to the 1995/96 levels, poverty incidence increased by 11.4% in urban areas and declined by 4.42% in rural areas in 1999/2000 even though the overall poverty incidence decreased by 2.86% during the same period. The situation is the same for female-headed households in urban Ethiopia. According to

MoFED (2002), in terms of rural-urban perspective, poverty incidence, depth and severity have declined in rural areas for both male-headed households (MHHs) and female-headed households (FHHs). However, in urban areas poverty incidence has increased for both MHHs and FHHs, the extent in the increase being higher for FHHs while the depth and severity of poverty declined for male-headed households and increased for female-headed ones. This study, by focusing on female-headed households, would concentrate on urban areas of Ethiopia.

1.3. Significance and Objectives of the Study

In Ethiopia, as in many other developing countries, there is a need to address the issue of poverty and to incorporate poverty alleviation program into the development strategy of the country. Although poverty in the country is not limited to female-headed households, the extent of the problem to this group compared to their male counterparts, suggest that these households should be given due attention in the effort of poverty alleviation. To that extent, studies that test the validity of the concern that FHHs are poorer than MHHs, assess their vulnerability to poverty and also identify the major determinants for the causes of the problem would have relevant policy implication for the efforts of poverty reduction programs.

Hence, the overall objective of this study is to maximize the understanding of the linkage between female-headed households and poverty in addition to their vulnerability to poverty in urban Ethiopia by way of attempting to make comparisons with their male counterparts.

Specifically the following are the main objectives of the study,

1. to measure the level of poverty, its depth and severity on female headed households in urban Ethiopia in a way making comparisons with their male counterparts,
2. to single out the major determinants of poverty on FHHs in urban Ethiopia, and
3. to assess the vulnerability of FHHs poverty.

Chapter Two

LITERATURE REVIEW

2.1. Conceptual Framework

2.1.1 Concepts and Methods of Poverty Analysis

The issue of poverty has been in shifts of emphasis in the development literature over the past decades, hence has suffered of different ambiguity and discord in concept, definition and measurements (Abebe and Bereket: 1996). There is no general consensus on any meaningful definitions of poverty. In general, before proceeding to the analysis of poverty, the following three logically distinct steps should be answered (Ibid).

1. How do we assess individual well-being or 'welfare'? (This refers to identification problem)
2. At what level of measured well-being do we say that a person is not poor? (Setting the poverty line)
3. How do we aggregate individual indicators of well-being into a measure of poverty? (This refers to aggregation problem).

A brief review of these concepts will be made as follows.

2.1.1.a. Concepts of Measuring Welfare

There are different approaches to the measurement of welfare. An important distinction is between the 'welfarist' and 'non-welfarist' approach. One of the differences between these approaches is based on the importance attached to the individual's own judgment about his or her well-being (Ravallion: 1992). The welfarist approach bases an assessment of well-being solely on individual utility levels (assessed by the individuals themselves). Therefore, as to the welfarist approach the value attached to commodities by the consumer himself and the

subsequent preference ordering is sufficient for assessing a person's well being. However, the non-welfarist approach pays little regard to the information on utilities. This approach attempts to assess the well being of an individual based on certain elementary achievements such as being adequately nourished, clothed and sheltered.

The approaches; therefore, differ in terms of the importance attached to the essentially materialist idea of 'standard of living' (Ravallion: 1992). In measuring the standards of living, the welfarist approach typically emphasizes aggregate expenditure on all goods and services consumed, valued at appropriate prices, and including consumption from own production, whereas the non-welfarist approach emphasizes specific commodity forms of deprivation, such as inadequate food consumption (inadequate nutrition) (Ravallion: 1992).

Whether to use household income or household consumption as the welfare indicator has been one of the issues in the measurements of welfare. According to Lipton and Ravallion (1993) in most developing countries, consumption rather than income have been preferred as a measure of living standards. This is because first current consumption is often taken to be a better indicator than current income of current standard of living because it is assumed that instantaneous utility depends directly on consumption, not on income as such. Second, since current consumption reveals information about incomes at other dates (past and future), it is said to be a good indicator of long-term average well-being. Third, income of individuals can be interpreted as a measure of welfare opportunity while consumption is regarded as a measure of welfare achievements by households. If one is concerned with the realized, rather than potential welfare, consumption is arguably more relevant measure of welfare. Furthermore, it is well known that consumption

fluctuates less than income, as there is consumption smoothing performed by households, that is, not all current consumptions are financed out of current income. Households respond to fluctuations in income by saving during good periods and dis-saving during lean periods to smooth their consumption. There can be practices like taking credits and receiving transfers by households to perform consumption smoothing. Finally, the other reason for preferring consumption as a better measure of welfare is that there is a belief that households are more willing to reveal their consumption behavior than they are willing to reveal their income.

2.1.1.b. Poverty Lines

Poverty lines are the starting point for analysis of poverty. Once the poverty line is determined, it means that one is able to define poverty. It is a measure that separates the poor from the non-poor. For any household, a poverty line is the command over resources that this household needs to have a certain welfare level that is chosen to be the poverty threshold (Hagenaars: 1986).

The following are some of the welfare concepts used in all poverty line definitions.

- whether an absolute or relative poverty concept is used,
- whether they are subjective or objective, and
- which equivalence scales are used,
- setting the poverty line.

Absolute *versus Relative Poverty Lines*

Poverty lines can be set in relative or absolute terms. An absolute poverty line is fixed with a change in the standard of living in society (Hagenaars: 1986). It refers to the position of an individual or a household in relation to a poverty line, whose real value is fixed over time

(Ravallion: 1992). On the other hand, a relative poverty line is related to the general standard of living in a society (explained by median income), i.e. relative poverty line increases and decreases by the same percentage that the standard of living of the society moves. In other words, while a relative poverty line has elasticity of one with respect to changes in living standard of the society, absolute poverty line has zero elasticity (Hagenaars: 1986).

The question of which of these poverty lines to use dominates the literature on the construction of poverty line. The distinction is important because it affects the way we perceive poverty-reduction policies. For instance, economic growth will generally result in a reduction in the number of people in absolute poverty, but only change in the distribution of income will reduce the number of people in relative poverty. Absolute poverty lines are mostly applicable in developing countries while relative poverty lines are commonly used in developed countries (Ravallion: 1992).

Subjective versus objective poverty lines

Objective or subjective criteria can be used in the definition of poverty line. The former is based on the objective aspects of somebody's situation and it is associated with command over resources while the latter is based on the opinion and feeling of the person concerned and is associated with the subjective evaluation by the welfare or utility that people experience (Hagnaars: 1986). In general, there might be perfect correlation between the two poverty lines if the subjective opinion of individuals whether they consider themselves to be poor is correlated with objective conditions like income, family size, etc. However, if the correlation is not perfect two conditions will be there. One is that some people may be classified as poor according to an

objective criterion such as income, family size, etc but may not classify themselves as poor or the reverse may hold.

Equivalence Scale

Although the ultimate interest and concern on poverty studies is related to an individual level, most information on consumption and income typically pertains to the household level as a whole. However, households differ in size and composition (such as age and sex), and hence a simple comparison of aggregate household consumption or income is quite misleading about the general well being of individual members of a given household. Given this fact, it is important to take such differences in size and composition into account. One of the most popular equivalence scales is adult equivalence that sets equivalence in the consumption of adult, a child, etc. This can be done by dividing household income or expenditure by the number of 'equivalent adult' in the household being considered, which are defined according to an appropriate country specific adult equivalence scale.

Setting the Poverty Lines

There are a number of different approaches to the determination of poverty line. The most common ones are direct calorie intake, food energy intake and cost of basic need methods. The ***direct calorie intake*** method defines poverty line as the minimum calorie requirement for survival. Therefore, individuals who consume below a predetermined minimum level of calorie intake are taken to be under poverty. This relates poverty to malnutrition. The limitation of this method is that the cost of acquiring such basic calorie requirement is not taken into consideration. Besides it overlooks the non-food requirements.

The other most popular method of setting poverty line that can overcome such problem is the ***food energy intake*** (FEI) method. This method of setting a poverty line tries to find consumption expenditure or income level at which a person's typical food energy intake (nutrient intakes) is sufficient to meet a predetermined food energy requirement (Ravallion and Bidani: 1994). Hence, in this method under nutrition is viewed as "food energy poverty" (Ravallion: 1992). The method also aims to measure consumption or income poverty rather than under nutrition because it takes not only the nutrient intakes in relation to requirements but also the incomes or consumption expenditures (Ravallion and Bidani: 1994).

There are different ways of estimating the expenditure needed to arrive at the stipulated requirements. A common practice is simply to calculate the average income or expenditure of a sub-sample of households whose estimated caloric intakes are approximately equal to the stipulated requirements (Ravallion and Bidani: 1994). Another procedure is to use a regression of the empirical relation between food energy intake and consumption expenditure (Ibid). By fixing the food energy intake cut-off, and then running a regression of calorie intake against consumption expenditures or income, one can find the consumption expenditure or income level at which an adult equivalent typically attain that food energy intake (Lipton and Ravallion: 1993).

However, despite its simplicity in calculation, there are some difficulties in applying the method. Setting the food energy requirement is problematic because the requirements vary across individuals and over time for a given individual. Setting the requirement needs the assumption about the activity level that determines energy requirements beyond those needed to maintain the human body's metabolic rate at rest (Ravallion and Bidani: 1994). Ravallion and Bidani (1994)

further argued that the method does not include differences in tastes, activity levels, relative prices, publicly provided goods, or other determinant that would change the relation between food energy intake and total consumption expenditure across any poverty comparisons. Hence, they argued that the FEI method is weak in terms of offering a consistent and robust poverty line.

The third method of setting poverty line is the ***cost of basic needs*** (CBN) approach. The measurement of poverty line based on basic needs, dates back to the work by Rowntree (1901) when he attempted to construct poverty line based on cost for basic needs such as food, housing and clothing (Hagnaar: 1986). According to this approach, poverty is a lack of command over basic consumption needs, and poverty line is the cost of those needs (Ravallion and Bidani: 1994). In order to set this poverty line, one has to first define the food poverty line by selecting a basket of food items typically consumed by the poor in which case the quantity is determined in such a way that the given bundle meets the predetermined level of minimum caloric requirement. Then, this basket is valued at the relevant prices. To allow for the non-food expenditure, the food share of the poorest quartile divides the food poverty line. Therefore, it could be noted that this method gives a representative poverty line accounting for both food and non-food expenditures, besides it is consistent across regions unlike food energy intake method. In order to do this, adjustments for spatial and inter-temporal variations could be made to establish a poverty line that is consistent across regions, groups and periods.

2.1.1.c. Poverty Indices

Once the welfare measure and poverty line is determined, it remains for the construction of an index to summarize the available information on the poor. Unlike other issues in poverty, the measurement of poverty has recently attracted a large body of literature. This owes Sen, 1976, a

great deal for bringing the issue into picture and put ground for its further development. Since Sen's (1976) article on axiomatic approach to the measurement of poverty, several indices of poverty, which make use of three poverty indicators, i.e., the percentage of the poor, the aggregate poverty gap and the distribution of income among the poor have been developed.

The earliest and the most common poverty measurement is the head-count ratio (H), defined as the number of poor (q) divided by the total number of people in the population (n). Later on, the poverty-gap, defined as the average income gap of the poor divided by the poverty line (Z) was developed. More formally, given that the income distribution in a population is ranked in ascending order such that:

$$Y_1 \leq Y_2 \leq Y_3 \leq \ldots \leq Y_q \leq Z \leq Y_{q+1} \ldots \leq Y_n$$

Where Z is an exogenously given poverty line, a level of income which an individual is classified to be poor, then, H is defined as

$$H=q/n$$

Similarly, the poverty gap or the income gap ratio, I, is defined as

$$I=\sum_{i=1}^{q} (Z-y_i)/q^Z$$

Sen (1976) began his work by offering a critique on these poverty indices that were commonly used at that time. He argued that these two popular measures of poverty violate such desirable properties as monotonicity[1] and transfer[2] axioms. H violates both monotonicity and transfer axioms while I violate the transfer axiom. H remains invariant to any changes occurring in the

[1] *Monotonicity:* a decrease in the income of a poor person should increase the poverty index, and vice versa.
[2] *Transfer:* a transfer from a poor person to a richer person should increase the poverty index and vice versa

income of individuals below the poverty line, that is, it does not respond to relative deprivation of the poor or to depth of poverty. I is a better measure as it gives good indication of the depth of poverty, and depends on the distances of the poor below the poverty line. However, I is insensitive to income transfers of equal magnitude occurring among the poor, i.e., it does not account for the severity of poverty. Motivated by these drawbacks of H and I, Sen then pursue an axiomatic approach to the measurement of poverty by using concepts for income inequality (Abebe and Berkete: 1996). According to him, any poverty index should be able to provide three basic information on poverty: it should be able to identify who the poor are, capture their average deprivation and thirdly their relative deprivation among themselves (Abebe: 1999). He began from what he called the basic equation to measure poverty defined as:

$$S(z) = A(z, y) \sum^{q}_{i=1} (z-y_i)\, v_i(z, y)$$

Where S (z) is an aggregate income gap of people whose income is no more than z, $v_i(z, y)$ is a non-negative weight given to the i^{th} individual and A (z,y) is a normalizing factor. Sen defines a poverty measure, where P= Max S (z), that is P is the maximum aggregate income gap of the poor in the community. If the income level of the poor is different, as it is usually the case, then the axioms of monotoncity, transfer, normalization and ordinal rank order weights are sufficient to generate a poverty index given by:

$$S(z,y) = H\,[I + (1-I)\, G_p]$$

Where $I = \sum^{q}_{i=1} (z-y_i) \backslash z$ and G_p is the Gini idex among the poor.

Hence, he introduced poverty index that combines the two familiar indices (H and I) with the third element income inequality amongst the poor. However, Sen's measure of poverty does not

satisfy the property of additivity which requires that aggregate poverty be equal to the population weighted sum of poverty levels in the various sub-group of society (Ravallion: 1992).

The poverty index given by Sen led to a series of reactions that formed a large body of the literature in the measurement of poverty. With that the list of requirements that have to be satisfied by a poverty index has grown larger with the literature on the measurement of poverty. However, whether one can find a poverty index that can meet all these requirements is still on doubt. According to Hagnaars (1986), on their reviews of literature, Kundu and Smith, 1984, have found that it is in general difficult to come up with any one poverty index that can fulfill all these requirements. Hagnaars (1986) also showed that no poverty index could meet all the desirable properties simultaneously. And the choice of a poverty index at any time is based on normative value judgment (Abebe: 1999).

Foster, Greer and Thorbecke (FGT) (1984) index is the most popular index in the recent literature for the fact that it captures the most desirable properties of a poverty index, and it is decomposable and sub-group consistent. The FGT index of general class is given by

$$P_\alpha = \frac{1}{n}\sum_{i}^{q}\left(\frac{z - y_i}{z}\right)^\alpha \qquad , \alpha \geq 0$$

Where,

P_α = measure of poverty
Z = poverty line
n = total number of households
q = total number of poor household
y = total expenditure of household

P_α is the mean over the whole population of an individual poverty measure which takes the value $(1-y_i/z)^\alpha$ for the poor and zero for the non-poor. When α equals 0,1, and 2; P_α equals head-count ratio (H), poverty-gap ratio (I), and poverty severity measure (P_2) respectively.

The head-count ratio (α=0), measures the incidence of poverty, the proportion of the population defined to be poor. The poverty-gap ratio (α=1) measures the mean depth of poverty as the proportion of the poverty line multiplied by the head-count index, i.e., it is the mean proportion by which the welfare level of the poor falls short of the poverty line. And the squared poverty gap measures the severity of poverty among the poor.

2.1.2 Concepts and Measurements of Vulnerability to Poverty

2.1.2.a. Concepts and Definitions

The issue of vulnerability has received a renewed attention recently. In the literature, one can find different concepts about its meaning. The consensus is that vulnerability can be best defined relative to some benchmark of 'ill-being' (Dercon: 2001). For an operational use and measurement purposes, 'vulnerability to poverty', in its various dimensions is the appropriate benchmark one can consider (Ibid).

Vulnerability is an important aspect of poverty that emerges strongly from household's different experiences in poverty (Pritechett, et al: 2000). "Vulnerability surrounding an individual's or a household's human condition concerns the potential now of a negative outcome in the future" (Christiaensen and Boisvert: 2000). Many households that are not currently poor may be vulnerable to events that lead them to poverty such as a bad harvest, loss of job and unexpected

expense, sudden illness, and lull in business, economic downturn, many other risks and shocks that people may face during the course of their life (Ibid).

Vulnerability, like poverty, is a multidimensional concept. The same as poverty, it can be conceptualized in income or the non-income space hence it faces the same set of issues of welfare (Chaudhuri et al: 2001). However, unlike poverty the concept is forward looking and it is implicitly concerned about uncertainty surrounding future events. Poverty is usually treated in a static, non-probabilistic terms (Christensen and Boisvert: 2000)) i.e., mostly poverty is defined as some function of the shortfall of current income or consumption expenditures from a poverty line and hence the measure is a single point in time (Pritchett et al: 2000). Vulnerability to poverty, on the other hand, is the probability that a household will experience a future period of poverty. It measures the exposure to poverty rather than the poverty outcome itself (Dercon: 2001). Therefore, basically the difference between poverty and vulnerability is that vulnerability is the ex-ante risk that a household, if currently non-poor, will fall into poverty in the future or if currently poor will remain in poverty while poverty is a present or ex-post measure of household welfare (Chaudhuri et al: 2001). The following statement can summarize the concept,

> "Well-being and poverty are the ex-post outcome of complicated decision process of individuals and households over assets and incomes, faced with risk. Vulnerability to poverty is the ex-ante situation, i.e. before one has knowledge of the actual shocks that will occur. Vulnerability is determined by the options available to households and individuals to make a living, the risks they face and their ability to handle this risk" (Dercon, 27: 2001).

One way of looking at poverty in terms of vulnerability could be to consider the chronically (permanently) poor as very vulnerable, the transient (temporarly) poor as vulnerable, and the non-poor as non-vulnerable (Christiaensen and Boisvert: 2000).

2.1.2.b. Measurements of Vulnerability

Currently, there is no as such explicit measure of vulnerability (Christiaensen and Boisvert: 2000). The same authors point out that in the past, the attempts made were to indirectly address the issue in a way providing some indications of vulnerability without developing actual measures.

As it has been defined before, poverty is measured at a point in time while vulnerability is forward-looking, using the information at a particular point in time (Dercon: 2001). Measures of vulnerability to poverty, therefore, has to take into consideration how likely dimensions of poverty and ill-being are to occur in the future, i.e. the probability of poverty for each individual (Ibid). The dimensions of poverty can be convincingly measured so that they are comparable across space, time and groups within a society. However, the measurement problem related to vulnerability is whether one can convincingly measure 'ex-ante' the possible outcomes of the process and their probability of occurring, when one is not yet clear about the possible outcomes of different sources of risk. Since the measure has to be forward-looking, it needs to be clear about the time horizon involved. Another aspect that the measurement needs to take into account is, it is not just the risks faced that need to be dealt with but also the options and ability to handle these risks. For the reason that different households may have different ability to handle the consequences of various 'state of the world', vulnerability to poverty has to take into account this diversity of experiences under different conditions.

In most of the cases, the key to estimating a household's vulnerability to poverty is to obtain an estimate of the households' variance of consumptions expenditure (Suryahadi and Sumarto: 2001). A reliable estimate of consumption expenditure variance can be obtained from panel data

collected over a sufficiently long period. However, it has been noted that most of the available standard data sources are based on cross-sectional household survey and cannot be used for this purpose. Hence, there is a need to develop method from estimated household consumption expenditure variance from cross-section data.

Currently, the method in most application use statistical methods to form a prediction model of future outcomes based on predicated mean consumption and predicated consumption volatility. Most of the applications used, infer the distributions of possible outcome shocks from error process in cross-section regression model explaining consumption outcomes by household variables.

Suryahadi, and Sumarto (2001) applied this model [following the work of Chaudhuri (2001)], in order to establish who is vulnerable to poverty. They use an estimate of the household's variance of consumption expenditures to measure the household's vulnerability to poverty in Indonesia from cross-section data.

We begin by assuming that for household h the stochastic process generating consumptions is as follows,

$$\ln c_h = X_h\beta + \varepsilon_h \text{ with } \varepsilon_h \sim N(0,\ X_h\theta) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where, c_h is per capita consumption expenditure, X_h represents bundle of observable household characteristics such as household size, location, educational attainment, etc., and ε_h represents shocks that contribute to differential per capita consumption for households that have the same

characteristics. And β and θ are coefficients to be estimated using Feasible Generalized Least Squares.

The procedures to be followed are as follows. First, it is possible to assume that the variance of ε_h from equation (1) depends upon household characteristics in some parametric way.

Assuming specific functional form, this can be formulated as follows:

$$\sigma^2_{e,h} = X_h \theta \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(2)}$$

The parameter θ can be estimated using a three-step feasible generalized least squares (FGLS) procedure. Firstly, estimate equation (1) using an ordinary least squares (OLS) procedure. Secondly, use the estimated residuals from equation (1) to estimate:

$$\hat{e}^2_{OLS,h} = X_h\theta + \eta_h \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(3)}$$

using OLS.

Then predictions from this equation are used to transform equation (3) into:

$$\frac{\hat{e}^2_{OLS,h}}{X_h\hat{\theta}_{OLS}} = \left(\frac{X_h}{X_h\hat{\theta}_{OLS}}\right)\theta + \frac{\eta_h}{X_h\hat{\theta}_{OLS}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(4)}$$

This transformed equation is estimated using OLS to obtain an asymptotically efficient FGLS estimate, $\hat{\theta}_{FGLS}$. Note that $\hat{\theta}_{FGLS}$ is consistent estimate of $\sigma^2_{e,h}$, the variance of the idiosyncratic component of household consumption. The estimates:

$$\sigma_{e,h} = \sqrt{X_h\hat{\theta}_{FGLS}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \text{(5)}$$

are then used to transform equation (1) into:

$$\frac{\ln c_h}{\sqrt{X_h \hat{\theta}_{FGLS}}} = \left(\frac{X_h}{\sqrt{X_h \hat{\theta}_{FGLS}}} \right) \beta + \frac{e_h}{\sqrt{X_h \hat{\theta}_{FGLS}}} \quad \text{.....(6)}$$

OLS estimation of equation (6) yields a consistent and asymptotically efficient estimate of β. The standard error of the estimated coefficient, $\hat{\beta}_{FGLS}$, can be obtained by dividing the reported standard error by the standard error of the regression.

Finally, given the estimate of β and θ obtained through this FGLS method, we are able to directly estimate expected log consumption:

$$\hat{E}[\ln c_h | X_h] = X_h \hat{\beta} \text{.....(7)}$$

and the variance of log consumption:

$$\hat{V}[\ln c_h | X_h] = \hat{\sigma}^2_{e,h} = X_h \hat{\theta} \text{.....(8)}$$

for each household h.

Then, by assuming that consumption (c_h) is log-normally distributed and ε_h is normally distributed; we are then able to use these estimates to form an estimate of the probability that a household with characteristics X_h will be poor, i.e, the households vulnerability level. Defining that Φ(.) denotes the cumulative density of the standard normal distribution, the household vulnerability is estimated as:

$$\hat{V}_h = \hat{\Pr}\ (\ln c_h < \ln Z | X_h) = \phi \left(\frac{\ln Z - X_h \hat{\beta}}{\sqrt{X_h \hat{\theta}}} \right) \text{.....(9)}$$

Where $\hat{V}_h$ denotes vulnerability to poverty, that is, the probability that the per capita consumption level (c_h) will be lower than the poverty line (Z) conditional on household characteristics (X_h).

2.2. Empirical Literatures

2.2.1 Empirical Literature on Poverty and Female-headed Households

2.2.1.a. Studies in Other Countries

The poverty literature shows, a large number of empirical studies conducted on the relationship between female headship and poverty. Although policy discussions regarding targeting FHHs in order to attack poverty is not new, it is still a controversial issue. The issues such as higher poverty among FHHs have been questioned, conventional definitions of household headship have been criticized and policy implications have been debated (Fuwa: 1999).

First, with regard to the concept of female headship, the problems with defining and measuring female-headed households are indicated in different studies. The use of the term "female-headed household' as a key indicator of the poverty of households introduces some conceptual problems (Rosenhouse: 1989). This poses the question if female headship can be an appropriate targeting criterion of poverty focused policy interventions.

With this regard, ***Buvinic and Gupta*** (1997) argue that, the first problem is that countries use different and hence often non-comparable definitions of both the term 'household' and 'head of household' in their census instruments. Second, there is ambiguity inherent in the term head of household when the assignment of headship is left to the judgment of household members in

which case they may use different criteria to make this assignment. The ambiguity may also arise for the fact that female headship may be a transitory phenomenon in the life cycle of families. In this regard, Rosenhouse (1989) argued that the absence of standard definition of headship led to inconsistency in the use of the term. For instance, usually male head and female head are not treated equivalently, i.e. male-head household often refers to a family with both adult male and female are present. In contrast, a female-headed household implies unpartnered women such as single, separated, divorced, or widowed. The third limitation is that the term head of household is not neutral. This is because it is loaded with additional meanings that reflect a traditional emphasis on households undifferentiated units.

Another problem that ***Rosenhouse*** (1989) indicated is that the use of the term ignores the fact that FHHs constitute a heterogeneous group of households. Detailed country studies tend to suggest that the relationship between female-headship and poverty could differ significantly depending on further disaggregating of reported headship by marital status and other demographic characteristic or alternative headship definitions (Fuwa: 1999). Rosenhouse (1989) further argues that the most serious problem with the use of the concept of headship is the assumption that it carries. Usually the term tends to imply a hierarchical relationship between household members and that the head is the most important member; that the head is regular presence in the home; has overriding authority in important household decision matters; and provides a consistent and central economic support. However, such may not necessarily be the case, hence this leads to a biased portrayal of the internal dynamics of households.

Many studies measure the incidence of income or consumption poverty among FHHs and compare it to that of male-headed counterparts. With this context the following studies have been reviewed.

Louat et al (1993) studied the welfare implications of female headship in Jamaican households. They basically used consumption as the measure of welfare and applied Foster-Greer-Thorbecke (FGT) poverty indices. As far as the welfare of the FHHs is concerned, the simplest comparisons of mean per capita consumption level between FHHs and MHHs lead to strong conclusion that FHHs are poorer than MHHs in Jamaica. However, adjusting consumption for household composition greatly lessens the force of the conclusion. The multivariate regression analysis showed that female headship has an independent and negative influence on the welfare level of the household. The other factors included in the multivariate analysis are age, educational level, occupation of the head of households, number of children, and the stability of union status. And the results indicated that positive relationship between year of education and age of the head. The more children and the younger they are, the lower is household welfare. And stability of union status is positively associated with welfare. Households with legal marriages have welfare levels that are higher than those with other union status, except for the widowed and divorced. When focusing on poverty, the FGT indices are by and large consistent with the notion that female headship is correlated with poverty. They used multivariate technique to determine whether headship per se has an independent influence on the probability of being poor or whether other household characteristics, correlated with headship, are responsible for these findings. Using a probit equation, they estimate the probability of falling with the group of poor using two poverty lines (higher and lower) and two measures of consumption (per capita consumption and adjusted per capita consumption). Then, the result indicated that the higher poverty line or using adjusted

per capita expenditures; female headship does not raise the probability that a household will be poor while using the lower poverty line or the unadjusted per capita consumption; female headship has an increasing probability that a household will be poor. This implies that the probability of being poor are sensitive to the poverty line set, the welfare measure used, and the poverty measure used. The other explanatory variables in the model considered have the similar effects as the determinants of welfare considered earlier. In general, the paper concludes that while most of the results show that the probability of being poor is somewhat higher for female-headed households, the difference with male-headed households is small. Hence, the authors come up with the recommendation that targeting social programs to FHHs will not be a successful way of reaching the poor.

Appleton (1995) made an analysis of women-headed households (WHHs) and poverty in Uganda. He used different poverty indicators such as consumption, income, time use, food consumption and food shares, assets and other social indicators such as education, and health. The study result shows that WHHs are not poorer when assessed by consumption and income. In terms of time use, although women do work longer hours, there is no evidence that women headed households' parity in income and consumption is brought at the expense of a further burden on women's time. When assessed by assets, they have less land, which is the most important asset for the majority of Ugandans; however ownership of this asset is not associated with higher economic welfare. They also have fewer other assets and consumer goods. Given these results, Appleton recommended that WHHs should not be designated as a target group for poverty alleviation programs. However the picture is somewhat different when the social indicators are considered. Compared to MHHs, WHHs face lower girls' school enrolment, higher mortality and lower usage of health care while lack of female education is the major source of

economic disadvantages they face. He extended his analysis by looking at sub-groups of women-headed households in terms of marital status and analyzed the causes of differences in poverty. The result then suggested that some sub-groups of WHHs such as widows are poorer in terms of consumption. However, such is not the case for the gender discriminations they would face for being widows, rather it is because of lower levels of female education that this sub-group face. Hence, the author came to conclusion that "expanding female education should do much to benefit the disadvantaged women headed households and women in general."

On the other hand, ***Buvinic and Gupta*** (1997) reviewed about 65 studies (16 from Africa, 17 in Asia, 32 in Latin America and the Caribbean) on women-headed households and poverty. And of the 65 studies that they reviewed, 61 examined the relation of female-headship to poverty. And of these 61 studies they reviewed, 38 studies found that FHHs were over-represented among the poor, additional 15 studies found associations between poverty and female headship, and only eight studies found no evidence of greater poverty among FHHs. In general, based on their findings, they recommended that headship is an important criterion for targeting antipoverty intervention. These reviews further pointed out three sets of facts that determine the greater poverty of these female households, which emerge from "the characteristics of household composition, the gender of the main earner, and the unique circumstances of being a female headed household." The first is related to the higher dependency burden that female-headed households carry despite their smaller size in comparisons with other types of households. The second factor, on the other hand, is that since the main earners of female-headed families are by definition women, they have "lower average earnings than men, fewer assets, and less access to a remunerative jobs and productive resources such as land, capital and technology." For instance, "in Brazil female-headed households have a 30% to 50% greater chance of being in poverty than

do male-headed ones, not because they have more children or fewer adults but because the female head earns less." The third is related to different factors such as women who are heads of household and have no other (female) adults help also have to fulfill home production or domestic roles, hence face greater time and mobility constraints than male heads. And the other factor is that women may encounter discrimination in access to jobs or resources, which force them, make inappropriate choices that affect the household's economic welfare. The last is that female heads may have a history of premature parenthood and family instability that tends to perpetuate poverty to succeeding generations.

Recently, ***Quisumbing*** et al (2001) examined the association between gender and poverty based on household survey data sets from ten developing countries [six from sub-Saharan Africa (including Ethiopia), three from Asia, and one from Latin America]. The paper computes income and expenditure-based poverty measures and investigates their sensitivity to the use of per-capita and per-adult equivalent units, and different specifications of the poverty line. It also tests for differences in poverty measures between individual males and females, and between households headed by males and females, using Foster-Greer-Thorbecke poverty measures and stochastic dominance analysis. Their results show weak evidence that females, as well as households headed by females, are over represented among the poor. "While female-headed households are worse off in terms of a number of poverty measures, these differences are statistically significant in one-fifth to one-half of the datasets, depending on the poverty measure used. Poverty measures are also higher for females than males; these differences are significant in a smaller proportion of the datasets (about a fifth to a third)." Particularly, their analysis using stochastic dominance tests reveals that it is only in two countries (rural Ghana and Bangladesh) out of the ten where FHHs have consistently higher poverty among the bottom third of population. They

also point to the need to analyze the determinants of household income and consumption using multivariate method focusing on female headship.

2.2.1.b. Studies in Ethiopia

Coming to the Ethiopian case, in his assessment of literature, ***Abbi*** (1997) showed that poverty studies based on disaggregated household data in the country have started to emerge as late as 1995 and focused only on deriving poverty lines and calculating poverty indices. Thus, he argued that little is known about the nature of poverty in the country. This seems especially true when one looks for studies that focus on women (or female-headed households) and poverty in the country. There is not as such extensive study which particularly focuses on the issue except very few.

Bigsten*, A*. et al (2002) in their studies of the link between economic growth and poverty based on the household data between 1994 and 1997 in the country, looked at the correlates of poverty in rural and urban areas separately. Of the many independent variables they have considered is a dummy for the gender of the head. Their results showed that in rural areas, compared to MHHs, FHHs face higher probability of being poor. In terms of the magnitude of its effect, this variable seems to be the most important correlates of poverty. Even though female headship can be caused by different factors, civil war seems to play an important role in Ethiopia. If we look at the percentage of FHHs by surveyed villages, the three with the highest percentages are found in areas where the civil war was for a long period of time. Unlike their counterparts in rural areas, the result further showed that FHHs in urban areas do not face a higher chance of being in poverty. They argued that the fact that agriculture is probably the only viable occupation and farm activities are traditionally male-dominated in rural areas and in contrast the availability of a

variety of occupations that females can participate in urban areas is probably the main explanations for this result. However, the model employed in the study does not allow us to further look into other important variables (such as education, and employment status of the female head) other than female headship, which can contribute to poverty or welfare status of households with female heads.

Another more extensive study is by ***Girma*** (1997) on comparisons of poverty on female and male-headed households in Addis Ababa. The paper examines the relative welfare level of FHHs compared to MHHs and found that there is no significant difference between them. It further identifies other characteristics, which are generally believed to be correlated to poverty, such as household size and education of head to have significant influence in determining the welfare level of the household rather than female head-ship. Thus, the study concludes that the issue of female-headship as a proxy for targeting program of poverty alleviation is not important as far as the definition of headship is not changed to reflect economic support. However, this study has it own limitation in that the data used in the study included only households in Addis Ababa hence do not represent the country or urban or rural regions of the country. In terms of the models used also, it is observed that the study is limited to modeling welfare and poverty incidence only.

The same study has been undertaken by ***Fistum*** (2002). He tried to compare the poverty indices between female and male-headed households in Addis Ababa. The study also tried to identify the determinates of welfare and poverty in both households using OLS, probit and tobit models based on the 1995/96 HICES data. Using descriptive analysis, the poverty indices could not indicate a clear trend that FHHs are poorer than MHHs. However, the regression result indicated that female-headship has a positive influence on the welfare of the household. Other variables such

as educational attainment of the household head and number of children in the household have been identified as an important determinants associated with poverty in most of the models. Therefore, he came up with a conclusion that policies designed to see the welfare difference between female-and male-headed households have to use definition of headship that reflect primary economic support, surveys also need to design to give this information. Thus, the issue of female-headship as proxy for targeting program of poverty alleviation is not recommended in the paper. This study is also limited to Addis Ababa, hence does not represent the country at large.

Thus, in light of few studies that have been made before, this study could be relevant to better emphasize and address the issue. It could contribute filling the gaps that has been left untouched on previous studies. That is, unlike the previous studies, the scope of this study will be extended to urban areas of the country and the models employed try to look into the determinants of the different aspects of poverty. In addition to this, the study will try to further look through the issue of vulnerability of female-headed households to poverty, which has not been considered on previous studies.

2.2.2 Empirical Literature on Vulnerability to Poverty

Recently, there are various empirical studies that have been done on the issue of vulnerability. The following are the reviews of some of the studies.

Christiaensen and Boisvert (2000) made an empirical analysis on measuring the household food vulnerability based on panel data (1997-98) from Northern Mali. The study indicated a methodology to empirically measure household food vulnerability. They defined food

vulnerability in terms of the probability now of being undernourished in the future. The empirical results then indicate that current poverty and vulnerability constitute separate dimensions of well-being and failure to account for food vulnerability might lead to substantial underestimation of a people's nutritional well-being. The results concerning the socio-economic factors determining a household's food vulnerability indicated that, food vulnerability increases unambiguously with the number of children in the household. Female-headed households, on the other hand, appear to be less vulnerable to drought shocks, partly due to community solidarity. Formal education is found to reduce household's vulnerability. Households with good harvests are also less vulnerable, though greater dependence on agriculture. Official food aid and family good gifts are important insurance mechanisms. Simulations indicate that food vulnerability can be significantly reduced through off-farm employment generation in the area and greater access to irrigation infrastructure.

Suryahadi and Sumarto (2001) make an assessment of what happened to poverty and vulnerability to poverty in Indonesia before and after the 1997 crisis began. Using cross-section data from household surveys, they estimate several categories of household poverty and vulnerability in Indonesia by combining the available information on current consumption levels, estimates of vulnerability to poverty and estimates of expected consumption levels. The results then show that the level of vulnerability to poverty among Indonesian households after the crisis unambiguously increased from pre-crisis levels. The number of households that have high vulnerability to poverty has tripled; as a result, the total number of households in the vulnerable category has increased from 18 percent of the population in 1996 to more that one third of the population in 1999. Likewise, it has been indicated that poverty rate in the country increases as a result of crisis; especially much of the increase has been due to an increase in chronic poverty.

Geographically, the proportion of both the poor and the vulnerable have increased much faster in urban than in rural areas. Across sectors, the agricultural sector has the highest proportion of both the poor (particularly the chronic poor) and the vulnerable, both before and after the onset of the crisis. Different household characteristics have been used in the estimation. Among these, the results indicate that the poverty rate and vulnerability to poverty among households headed by females do not differ widely from their male counterparts. In fact, the poverty rate, and in particular the incidence of chronic poverty and the proportion of those in the high vulnerable group among MHHs, tends to be slightly higher than the FHHs.

Christiaensen and Subbarao (2001) attempt to measure vulnerability to consumption shortfalls and analyze its sources using a two-period panel of non-pastoralists community in rural Kenya using the 1994 and 1997 data. The estimated results indicate that in 1994 one fifth of the communities had a chance of at least 50 percent of falling below the poverty line in the future. It has been found that income diversification, adult literacy, market accessibility and the availability of electricity to be vulnerability reducing, while a community's malaria incidence strongly increases the vulnerability of households. When controlling for other variables female-headed households are not more vulnerable. The authors argue that this is consistent with other recent empirical studies and as a reason for this they put the basic solidarity in the face of widespread shocks. In order to reduce vulnerability among non-pastoralist communities in rural Kenya, policy simulations indicate that targeted interventions to reduce malaria incidence, improving access to food markets, and increasing the adult literacy ratio together with actions to promote off-farm employment opportunities are relevant.

Chapter Three

METHODOLOGY OF THE STUDY

3.1. The Data Sources

The study is based on the 1999/2000 Household Income, Consumption and Expenditure Survey (HICES) and Welfare Monitoring Survey (WMS) that were conducted by Central Statistical Authority (CSA). These surveys covered the population in sedentary areas of the country (the nine Regional States and two administrative regions) on a sample basis, each of which is composed of rural and urban parts excluding the non-sedentary population in Afar and Somalia Regional States and residents of collective quarter, homeless persons and foreigners (CSA: 2001).

A stratified two-stage sample designing was used to select the sample. The primary sampling units were enumeration areas (EAs). Sample EAs from each domain were selected using systematic sampling that is probability proportional to size; size being number of households obtained from the 1994 population and housing census. In doing this, a total of 1264 EAs (722 in rural and 542 in urban areas) were selected to be covered in each round of the survey in all regions. Then, in each round the survey was conducted on the basis of 12 rural and 16 urban households systematically selected form each EA. And ultimately, a total of 8672 households have been covered in urban areas all over the country (CSA: 2001).

The household based questionnaires in both surveys provide information regarding the basic population characteristics such as sex, age, household size, marital status, education and employment. And in particular, the HICES include information regarding the household

consumption expenditure; food and non-food expenditures; as well as quantities consumed; payments; receipts; and income. The food consumption expenditure is calculated by adding up the value of subsistence food consumption to cash expenditure on food. The non-food expenditures are cigarettes, alcohol, clothes, household goods, transports, ceremonial expenditures, health, education, value of water, firewood and other fuel, and imputed value is used for those not pausing for these commodities. The WMS also provides detailed information on the different dimensions of poverty and welfare particularly non-income dimensions of poverty such as the status of education, health and vulnerability i.e., access to education and health facilities, achievements in education, anthropometrics measures, and underlying bases of the poor and on the opportunities available to households.

3.2. Method of Data Analysis

3.2.1. Poverty Analysis

3.2.1.a. Measure of Well-being

Consumption-based rather than income-based measure of individual welfare is used in this study. This is motivated by the facts stated in the literature part particularly, it is because consumption better captures long-run welfare, and it better reflects households' ability to meet their basic needs and also household's access to credit and its savings at times when their income is too low. In addition, it is better measured than income in developing countries.

However, before applying the consumption expenditure to respective poverty measurements, using relative price index (spatial and temporal), given in Table A2 (See Annex), nominal consumption expenditure is deflated so as to get real expenditure at a base year constant price.

To do this, while the base for the relative spatial price index is the national average, the base for the temporal relative price is 1995/96. In addition to this, real consumption per adult is calculated by adjusting the household size for adult equivalent household size. Adult equivalent household size is computed based on data sources from the Untied Nations World Health Organization (See Annex, Table A3).

3.2.1.b. Poverty Lines

The poverty lines that are used in this study, both the food and total poverty lines, are adopted from Dercon (1997). These poverty lines were set using the commonly used cost of basic needs (CBN) approach based on the data from 1995/96 HICES by CSA. Following this approach, an absolute food poverty line was set on the basis of the cost to obtain sufficient food to give 2200 Kcal per adult per day, taking into account the typical diet of household in Ethiopia. To do this, first the common bundle of food items meeting the pre-determined minimum nutritional requirement (2200 Kcal per day per adult) has been defined taking into account the typical diet of household in Ethiopia. This typical diet has been constructed using the caloric share of the food items in the consumption of the poorest quartile (See Annex, Table A1). Second, the cost of this representative food bundle is estimated. For this purpose, the contribution of this diet to calories is calculated. Quantities of each food item necessary to reach to 2200 Kcal were then multiplied by the regional average price of food item. Then, the food poverty line is the sum of these values. To come up with total poverty line, assuming that the share of consumption devoted to non-food for households in the lower half of the distribution is essential, the total poverty line equals the food poverty line divided by the average food share of the poorer households. Following the above procedures, the poverty lines presented in Table 3.1 have been constructed. Note that

moderate poverty is a poverty line based on a food basket of 2750 Kcal and extreme poverty line is based on food basket of 1650 Kcal per adult per day.

Table 3.1 Various Poverty Lines

Various Poverty Lines	Food Poverty Line per Adult Equivalent Per Annum (Birr)	Kcal Per Adult Equivalent per Day	Total Poverty Line Per Adult Equivalent Per Annum (Birr)
Moderate Poverty Line	809.76	2750	1343.78
Poverty Line	647.81	2200	1075.03
Extreme Poverty Line	485.86	1650	806.27

Source: Dercon, 1997

3.2.1.c. Poverty Measurements

In order to measure the extent of poverty, we need to develop a poverty measure that can summarize the magnitude of poverty. In many studies, FGT (Foster, Greer, and Thorbecke) measure of poverty developed by Foster et al (1984) has been found manageable in presenting information on the poor; hence will be used in this study too. This measure, as has been discussed before, summarizes the level, depth and severity (incidence, inequality and intensity respectively) of poverty.

The FGT formula that is normally used is summarized as,

$$P\alpha = \frac{1}{n}\sum_{i}^{q}\left(\frac{z - y_i}{z}\right)^{\alpha} \quad , \alpha \geq 0$$

Where α equals 0, 1, and 2, P equals head-count ratio, poverty-gap ratio, and poverty severity measure respectively.

Z=poverty line
n=total number of households
q=total number of poor household
yi=total expenditure of household
Pα=measure of poverty

The head-count ratio (α=0) measures the incidence of poverty, the proportion of the population defined to be poor. The poverty-gap ratio (α=1) measures the mean depth of poverty as the proportion of the poverty line multiplied by the head-count index. And the square poverty gap (α=2) measures the severity of poverty among the poor.

One of the advantages of FGT measure of poverty indices is that it can be decomposed into sub-groups. Hence, in this study we will also try to know the contributions of FHHs and MHHs to total poverty. It can be done as follows;

$$P_\alpha = K_f P_{f\alpha} + K_m P_{m\alpha}$$

Where K_f and K_m are the proportion of female heads and male heads in the sample respectively and $P_{f\alpha}$ and $P_{m\alpha}$ are the poverty indices for FHHs and MHHs respectively. Then, the contribution of each group is given by:

$$C_j = K_j P_{j\alpha} / P_\alpha$$

Where j = f and m.

3.2.1.d. Multivariate Analysis

Specifications of the Empirical Model

Two approaches can be distinguished in modeling the determinant of poverty. The first approach is modeling the determinants of log of consumption at household level.[1] And the second approach, which is known as the direct modeling of the household level poverty measure, is given by:

[1] The logarithm of consumption is estimated because its distribution more closely approximates the normal distribution than does the distribution of the consumption levels. In other words, this assumption implies that households' consumption level follows a lognormal distribution.

$$P_{\alpha,j} = \beta'_{\alpha} X_j + \varepsilon_j$$

Where, $P_{\alpha,j}$, refers to the respective poverty measures for household j estimated using the FGT class of poverty measurement. When α takes a value of 0, 1 and 2, the aggregate poverty measure corresponds to the incidence of poverty or head-count index, the poverty gap and the squared poverty gap indices respectively. In view of this, the following models have been employed in this study.

1. OLS Regression

Despite its popularity, there are several reasons why modeling household consumption is preferable to modeling household poverty levels directly. The following are among the major reasons:

(a) Using data on only $P_{\alpha, j}$ is inefficient in the sense that it involves a loss of information as information on households living above the poverty line is intentionally suppressed. This is to say that all non-poor households are treated alike, as censored data (Datt, et al: 2000).

(b) There is an inherent arbitrariness about the exact level of absolute poverty line. Hence, different poverty lines would imply that household consumption data would be censored at different levels, and the estimated parameters of poverty model would change with the level of poverty line used. As the consumption model estimates are independent of the chosen poverty line they are preferred to modeling household poverty levels directly (Ibid).

(c) Estimation of the consumption model avoids strong distributional assumption that may be required by the probit or logit model estimation, which are commonly used in modeling household poverty levels directly (Ibid).

(d) Multivariate associations between welfare and other variables can identify connections that appear to be strong and suggest causations, or at least priorities for further analysis; hence when discussing multivariate analysis of determinants of poverty modeling household consumption is proposed (Appleton: 1995).

For the reasons mentioned above, we first model the household welfare function using a level least square regression (OLS), which is estimated taking the standard of living as a continuous dependent variable, conducted for all households (poor and non-poor). The simplest specification of such model could be given as:

$$\ln(C_j) = \beta' X_j + U_i$$

Where C_j stands for per capita consumption of household j, X_j denotes a vector of household characteristics or other determinants of consumption, and U_i is a random disturbance term, which is assumed to be normally, independently and identically distributed with mean 0 and variance σ^2.

2. Probit Model (Modeling the Incidence of Poverty)

A probit model will be adopted in order to model factors that determine the probability whether a household is poor or not, i.e., the incidence of poverty. Here the dependent variable is thus dichotomous, indicating whether a household is poor or not relative to the poverty line. And the model is given as,

$$Y^{*}_{i} = \beta' X_i + U_i \quad (i = 1,2,\ldots,n)$$

Where Y^{*}_{i} is the underlying response variable in which Y_i =1 if poor, Y_i =0 if non-poor, and X_i is a set of explanatory variables, and U_i is the residual. And the coefficients of the estimated model give the factors that more likely make households poor.

3. Ordered Probit Model

ln order to focus attention on the hard-core poor (extremely poor), an ordered probit model is employed. This approach is justifiable, because one can explicitly order the population sub-sample, using poverty lines as cut-off points (Alemayehu et al: 2001). The population sub-groups can be identified in several stages. In the fist stage, one can identify the poor and the non-poor. In the second stage, one can examine the probability of being in extremely poor once the person is identified as poor, hence this will allow us to compute the probability of being in hard-core poverty. In order to do this, we then first classify the poor and the non-poor from the total sample and then further classify the poor into absolutely (non-hardcore-core) poor and extremely (hard-core) poor. Hence, the final classified population group of concern would be categorized as the non-poor, absolutely poor and extremely poor.

Explaining why some individuals are non-poor, poor or extremely poor is best done with ordered probit. Since these categories have a natural order, the ordered probit is the appropriate model to employ the estimation of relevant probabilities (See Maddala 1983). Assuming three categories (1, 2 and 3 and associated probabilities P_1, P_2, and P_3 respectively), an individual would fall in category 3 if $u < \beta' x$; in category 2 if $\beta' x < u \leq \beta' x + \alpha$; and in category 1 if $u \geq \beta' x + \alpha$, where $\alpha > 0$ and u is the error term in the underlining response model. Thus, we have:

$$P_3 = F(\beta' x)$$

$$P_2 = F(\beta' x + \alpha) - F(\beta' x)$$

$$P_1 = 1 - F(\beta' x + \alpha) \quad \text{.....(1)}$$

Where the distribution F is normal in the ordered probit model. This can be generalized as follows. Let the underlying response model be described as:

$$Y_i = \beta' x_i + u_i \quad (i = 1,2,\ldots,n) \quad \text{.....(2)}$$

Where Y is the underlying response variable, x is a set of explanatory variables, and u is the residual. We shall now define the ordinal variables as

$Z_{ij} = 1$ if Y_i falls in the j^{th} category

$Z_{ij} = 0$ Otherwise (i = 1,2…n, j = 1,2…m)

$$\text{Prob}(Z_{ij} = 1) = \phi(\alpha_j - \beta' x_i) - \phi(\alpha_{j-1} - \beta' x_i) \quad \text{.....(3)}$$

Where ϕ is the cumulative distribution and the α_i's are the equivalents of the α's in equation (1).

4. Tobit Model (Modeling Poverty Gap and Poverty Severity)

In order to model the poverty gap and poverty severity, following Appelton (1995), a censored tobit model will be used. The measure of household poverty, P_i, is given by:

$$P_i = [(Z - C_i) / Z]^{\alpha} \quad \text{if } C_i < Z$$

$$= 0 \quad \text{elsewhere}$$

Where α is equal to 0, 1, and 2, P_i refers to headcount, poverty gap and poverty severity of the household respectively, Z = poverty line and C_i = consumption expenditure of household i.

Then, modeling this would be equivalent to modeling a censored dependent variable, C^*_i, equal to the real consumption of the poor but fixed at the poverty line for the non-poor. That is to say,

$$C^*_i = X_i\gamma + U_i$$

And in the censored regression model, the observed C_i is given by,

$$C_i = C^*_i \quad \text{if } P_i > 0$$

$$= 0, \quad \text{otherwise}$$

Where C_i is consumption expenditure of household i, X_i is vector of determinant of welfare including household characteristics, and γ is vector of parameters.

Therefore, under this model variations in consumption above the poverty line are not modeled. In this formulation, the consumption of the poor is determined with the error term assumed to be normally distributed and variance σ^2. And the estimates of poverty function are obtained by maximizing the log likelihood function (see Madala, 1983).

Description of the Variables

The set of variables that is hypothesized to determine the level of consumption, and hence poverty, may be categorized into different household characteristics. Among the set of potential determinants of poverty, an attempt is made to choose those variables that are arguably exogenous to current consumption. For instance, variables such as current school attendance by children, value or possession of durable goods, dwelling characteristics, and the like are omitted from the regression for the reason that such variables are outcomes, rather than determinants of poverty. The lists of explanatory and dependent variables used in all the models are summarized

in Table 3.2. And it is to be noted that most of the variables are differentiated by gender of the household head.

Table 3.2. List of Variables

1. List of explanatory variables
Gender SEX = 1 if the head of the household is female, 0 otherwise
Age of the household head: AGE = age of the household head (years) AGESQ = age of the household head squared.
Marital status of FHHs: SINGLEF = 1 if the female head is unmarried, widowed, divorced or separated, 0 otherwise. **Marital status of MHHs**: SINGLEM = 1 if the male head is unmarried, widowed, divorced or separated, 0 otherwise.
Household size and Dependency ratio (proportion): CHILD0_7= Number of Children in the age of 0 to 7 CHILD7_14 = Number of Children in the age of 8 to 14 ADULT = Number of adults in the age of 15 to 64 OLD = Number of elderly people above the age of 64
Schooling of FHHs: ILLITF = 1 if female head is illiterate, 0 otherwise (omitted group) GR1_6F = 1 if female head is primary, 0 otherwise GR7_11F = 1 if female head is secondary school, 0 otherwise GR_12F =1 if female head is 12^{th} grade, 0 otherwise HIEDUF =1 if female head is above 12^{th} grade, 0 otherwise **Schooling of MHHs:** ILLITM=1 if male head is illiterate, 0 otherwise (omitted group) GR1_6M =1 if male head is primary, 0 otherwise GR7_11M =1 if male head is secondary school, 0 otherwise GR_12M =1 if male head is 12^{th} grade complete, 0 otherwise HIEDUM =1 if male head is above 12^{th} grade, 0 otherwise

Employment Status of FHHs:

UNEMPF =1 if female head is unemployed, 0 otherwise (omitted group)
FORMEMPF =1 if female head is employed in the formal sector, 0 otherwise
INFEMPF =1 if female head is employed in the informal sector, 0 otherwise
SELFF =1 if female head is self-employed, 0 otherwise

Employment Status of MHHs

UNEMPYM =1 if male head is unemployed, 0 otherwise (omitted group)
FORMEMPF =1 if male head is employed in the formal sector, 0 otherwise
INFEMPM =1 if male head is employed in the informal sector, 0 otherwise
SELFM =1 if male head is self-employed, 0 otherwise

LOCATION:

CITY: 1 if A.A, Dire Dawa and Harrari, 0 otherwise

2. List of dependent variables

Lnhexae = log of real consumption expenditure per adult equivalent
P_0 = head count ratio (1 if the household is poor, 0 otherwise
P = 1 if the household is non-poor, 2 if the household is absolutely poor, 3 if the household is hardcore (extremely) poor
P_1= poverty gap (the depth of poverty)
P_2 = poverty severity

The set of determinants of poverty may broadly be classified into the following categories:

Socio-demographic Characteristics: This includes gender, age (and age squared), household size and marital status of the head. We introduce age-square to introduce the non-linear relationship between age and the dependent variable. And also, household size and its composition are distinguished into four age groups: under 7 years, 8-14, 15-64 and 65 years of age and above.

Education: Several measures pertaining to different levels and dimensions of educational attainment by household heads are included in the regression. Assuming that returns to male and female education may be different, household heads with different levels of education is differentiated by gender. As it is shown in Table 5.2 the various level of schooling include: primary (grade 1 to 6), secondary grade (9 to 11), 12^{th} grade and above 12^{th} grade which includes certificate, diploma and degree levels.

Employment: In order to take into consideration the different employment characteristics, the employment dummy is distinguished as unemployed, formal and informal sector employee and self-employment.

Location: In order to know the importance of region of residence in the poverty status of the household, location dummy is included. The analysis is to be made relative to three regions (city states) with the more or less same characteristics (i.e. Addis Ababa, Harari, and Dire Dawa).

3.2.2. Measurement of Vulnerability to Poverty

Following the work of Suyahadi and Sumarto (2001), in order to measure vulnerability to poverty, the variance of household consumption expenditures is used.

Defining that $\Phi(.)$ denotes the cumulative density of the standard normal distribution, the household vulnerability is estimated as:

$$\hat{V}_h = \hat{\Pr}\ (\ln c_h < \ln Z \big| X_h) = \phi\left(\frac{\ln Z - X_h\hat{\beta}}{\sqrt{X_h\hat{\theta}}}\right)$$

Where $\hat{V}_h$ denotes vulnerability to poverty, that is, the probability that the per capita consumption level (c_h) will be lower than the poverty line (Z) conditional on household characteristics (X_h). The details are in the literature review part on section 2.1.2.b.

Chapter Four

DESCRIPTIVE ANALYSIS OF THE DATA SET

4.1. Socio-demographic Characteristics of the Household Head by Gender

The survey has covered about 8674 households[1] in urban areas within the eleven regions of the country. Of these sampled households, female-headed households[2] comprise about 41% of the households in urban area. Among the different regions in urban Ethiopia, except in Tigray the number of households headed by male households is quite larger than the ones headed by females (See Table 4.1). The proportion of households headed by female ranges from 53% in Tigray to 29% in Afar and S.N.N.P.

Table 4.1. Gender of the Household Head by Region

Region	Gender of the Head				Total	
	Male		Female			
	f*	%	f*	%	f*	%
Tigray	323	46.9	365	53.1	688	7.9
Afar	283	70.6	118	29.4	401	4.6
Amhara	836	52.3	764	47.8	1600	18.4
Oromia	1145	60.1	759	39.9	1904	22.0
Somalia	265	55.2	215	44.8	480	5.5
Benishangul-Gumuz	272	68.0	128	32.0	400	4.6
S.N.N.P	519	67.6	249	32.4	768	8.9
Gambela	271	70.6	113	29.4	384	4.4
Harari	197	53.4	172	46.6	369	4.3
Addis Ababa	716	59.7	484	40.3	1200	13.8
Dire Dawa	297	61.9	183	38.1	480	5.5
Total	5124	59.1	3550	40.9	8674	100.0

*f =frequency

Considering household size, according to the survey, the average household size for the urban population is 4.6 persons with the most common household size being four member households

[1] Household constitutes of a person or group of persons, irrespective of whether related or not who normally live together in the same housing unit or group of housing units and who have common cooking arrangements.

[2] A head of a household is a person (male or female) who economically supports or manages the household or for reasons of age or respect, is considered as head by the household or declares himself as such or by member of the household.

followed by three, five and two-member households all of these accounting 59.9% of the households in urban areas. It can also be seen that the households headed by females have lower average family size (3.7 persons) than the average household size of MHHs (5.1 persons).

Table 4.2. Household Size by Gender of the Head

	Male	Female	Total
Average Household Size and Dependency Ratio			
Average Household Size	5.11	3.74	4.55
Dependency Ratio	0.82	0.835	0.83
Household Size of the Head			
Household size	**%**	**%**	**%**
1	6.0	14.0	9.3
2	9.1	19.6	13.4
3	13.5	18.5	15.6
4	16.8	17.2	17.0
5	14.8	11.8	13.6
6	12.8	7.7	10.7
7	9.7	4.8	7.7
8	7.0	3.2	5.4
9	4.7	1.6	3.4
10 & above	5.6	1.6	4.0
Total	100.0	100.0	100.0

Making comparisons within the household sizes, the number of FHHs as compared to MHHs is higher at the lower family size range (1 to 4 family members) than at higher ranges (5 to 10 and above family member). As it is shown in table 4.2, about 14% of the FHHs are single while this is only 6% for MHHs. And also about 67.2% of FHHs have family members 2 to 5 as compared to 54.2% for MHHs; however at the other end, 40% of MHHs have more than five family members while it is only 19% for FHHs. Table 4.2 further shows that among the FHHs themselves, the most common family size is two-members (19.6%) followed by three (18.5%), four (17.2%) and single (14.0%) member of the household all accounting 69.3% of the FHHs. These all in general indicate that the majority of the surveyed FHHs tend to have lower number of family members compared to MHHs. On the other hand, there is no significant variation in

the dependency ratio (defined as household members older than 65 and younger than 15 divided by the number of those in between the age of 15 and 65) of female and male-headed households, both being 0.835 and 0.82 respectively.

If we then consider the age of the household head, the survey indicated that the average age of a household head in urban Ethiopia is about 43.5 years, in which both male and female heads have almost the same average years of age, 43.3 and 43.7 respectively and most of the age group lies in the age of 31 to 40, 41 to 50 and 21 to 30 age categories in their order.

Table 4.3 Age of the Head by Gender

	Male	**Female**	**Total**
Average Age of the Household Head			
Average Age	43.3	43.7	43.5
Age of the Household Head by categories			
Age	**%**	**%**	**%**
13-20	1.5	3.6	2.4
21-30	18.0	21.2	19.3
31-40	31.3	25.8	29.0
41-50	24.0	19.0	21.9
51-60	13.5	15.0	14.1
61 and above	11.8	15.4	13.2
Total	100.0	100.0	100.0

Among the FHHs, most of the female heads (25.8%) fall under the age group of 31 to 40 years of age followed by 21 to 30 (21.2%) and 41 to 50 (19%) years of ages together accounting about 66% of the female-headed households reported. This shows that most of the female-headed households are of in age group considered to be productive. However, this is especially true for MHHs. As shown in Table 4.3, compared to FHHs, between 21 and 50 years of age, MHHs are somewhat higher in number than FHHs. On the other hand, the number of FHHs at older ages, above 51 years of age, is found to be higher than MHHs, 30.4% as opposed to 25.3%.

Marital status is another socio-demographic variable to be considered. It can be seen from Table 4.4, more than half of the reported household heads in urban Ethiopia, 58.9%, are married, followed by widowed (18.8%) and divorced (10.9%) household heads.

Table 4.4. Marital Status of the Head by gender

Marital Status	Male (%)	Female (%)	Total (%)
Never married	8.1	8.6	8.3
Married	85.3	18.6	58.0
Widowed	3.1	41.5	18.8
Divorced	2.1	23.5	10.9
Separated	1.4	7.7	4.0
Total	100.0	100.0	100.0

Within this, among the FHHs, it has been found that most of the female heads, 41.5%, are widowed followed by some divorced and married female heads accounting 23.5% and 18.6% of the FHHs respectively. Therefore, the main reason for observing female heads is the fact that they are widowed or divorced. On the contrary, 85.3% of MHHs, as opposed to 18.6% of female heads, are married. And in general, it is only the number of household heads who have never been married which are more or less equal between both sexes.

4.2. Education Level of the Household Head by Gender

Overall, of the household heads reported, about 60% of the household heads in urban Ethiopia are literate with different level of schooling, the largest part of the sample population being in grades 4 to 12. In terms of literacy status, MHHs do much better than FHHS, accounting 76.8% and 36% respectively. In each level of schooling, most of the female-headed households considered tend to be lower in number as compared to male-headed households. The same as the

MHHS, most of the female heads tend to concentrate in grades 4 to 12 while the number of heads with school levels higher than 12^{th} grade is very small especially for female heads.

Table 4.5 Schooling of the Head by Gender

Schooling	Male (%)	Female (%)	Total (%)
Illiterate	22.8	63.4	39.4
No level completed	5.8	2.6	4.5
Grade 1-3	5.0	3.9	4.5
Grade 4-6	16.3	8.5	13.1
Grade 7-8	11.9	7.6	10.1
Grade 9-11	9.7	4.2	7.5
Grade 12	13.5	6.9	10.8
Certificate	6.1	1.7	4.3
Higher Education	8.9	1.3	5.8
Total	100.0	100.0	100.0

4.3. Employment Status of the Household Head by Gender

Of all the household heads considered in urban Ethiopia, 73.8% of them are employed in different sectors while the rest are unemployed for different reasons stated in Table 4.6. The employment status of the household heads in the region differs significantly by gender of the household head, in which about 39.1% of FHH are unemployed as opposed to the 17.2% of unemployed MHHs showing that the unemployment rate of FHHs is more than twice as the rate for MHHs. For the majority of unemployed FHHs (35%) in the region, their reason for not working is domestic service; however on the contrary it is a reason for unemployment of less than 1% of the MHHs. The next related reasons are their being pensioners and too old for work each occupying 19% of FHHs, and 10.7% are handicapped, 8.7% of them are looking for a job while only 3.5% of them are students. On the other side, the majority of MHHs (41.3%) claim not to be engaged on work for they are pensioners while 18.9% are looking for a job, 16.5% are too old, 13.8% are handicapped, and 5.2% are students.

Table 4.6 Employment Status of the Head by Gender

	Male (%)	Female (%)	Total (%)
Employment Status of the Head			
Unemployed	17.2	39.1	26.2
Formal sector employee*	9.9	5.1	7.9
Informal sector employee**	33.9	11.9	24.9
Formal sector self-employed	14.7	5.0	10.8
Informal sector self-employed	24.3	38.8	30.2
Reasons for not Working			
Looking for a job	18.6	8.7	27.3
Student	5.2	3.5	4.2
Domestic service	0.8	35.1	22.6
Pensioner	41.3	19.1	27.2
Old	16.5	19.0	18.1
Handicapped	13.8	10.7	11.8
Others	3.1	3.2	3.2
Total	100.0	100.0	100.0

* Employed in a formal private sector, public sector or Non-governmental Organizations.

** Employed in informal private sector, house servant, unpaid family worker

On the other hand, the majority of those employed are self-employed (41%) both in informal and formal sector, the former being higher (24%). Within this, the majority of the FHHs are engaged in the informal sector, i.e., about 38.8% and 11.9% of FHHs are self-employed and employees in the informal sector respectively whereas only 10% of them are employees and self-employed in the formal sector. Similarly, the majority of MHHs concentrate in the informal sector within which about 33.9% are informal sector employees followed by 24.3% who are self-employed in the informal sector. However, relatively there are more MHHs (24%) employed in the formal sector than FHHs (10%) in the same sector.

4.4. Consumption Expenditure of Household Head by Gender

As shown in Table 4.4, the average real per capita consumption expenditure in the year 1999/00 is found to be 1402 Birr while real consumption expenditure per adult equivalent is 1702 Birr.

Table 4.7 Real Annual Consumption Expenditure of 1999/2000 for the household head by gender(in Birr)

Items	Male	Female	Total	t-value*
Real food expenditure per capita	775	724	745	7.11
Real non food expenditure per capita	711	619	657	7.05
Real total expenditure per capita	1487	1343	1402	9.18
Real food expend per adult equivalent	934	843	897	5.11
Real non food expend per adult equivalent	795	819	805	2.22
Real total expenditure per adult equivalent	1729	1663	1702	1.65
Share of food in total expenditure	0.52	0.56	0.54	7.09
Calorie intake per adult per day	1868	1846	1859	1.19
Adult equivalent Household Size	5.3	3.01	4.2	9.53

* t-test for the difference by gender of the household head.

And a comparison of mean real per capita consumption expenditure by gender of the household head reveals FHHs are poorer than MHHs, with 10% lower real consumption per capita, mainly due to lower non-food expenditure in real terms. And in that per capita real food and non-food expenditures are 7% and 14% higher for MHHs than FHHs. As indicated by the corresponding t-values, these differences are statistically significant. However, if this comparison is to be made based on the real consumption expenditure per adult equivalent, one can see that total and non-food expenditures for FHHs are very close to that of MHHs (the difference is only 3% for each of them); but still real food expenditure is significantly lower by 9% for FHHs as compared to MHHs. Food accounts about 54% of an average household's expenditure in the region, in which it takes 56% and 52% of an average expenditure of FHHs and MHHs respectively. The average

calorie intake per day in the region is 1859, and it is 1868 for MHHs and 1846 for FHHs, all below the recommended norm of 2200 Kcal per day per adult.

Table 4.8 presents the consumption expenditure quintile in which the household belongs given the various household characteristics. In terms of household size, households in the 1st and 2nd quintiles have larger household size, 4.78 and 4.62 individuals per household than the ones at the higher quintiles implying that poorer households have higher mean household size than the richer ones although the difference is not that much higher. The same as this, the average dependency ratios shows that poorer households tend to have larger proportion of dependents, 1.02 in the first quintile as opposed to 0.6 in the 5th quintile.

The age of the household head does not imply a clear trend on the relationship between the age of the household head and poverty. It is shown that household heads in the 5th quintile have an average age of only 43 years while the average age of those in the 1st quintile is 44.5 years.

There is no clear relationship between the poverty status of the households and gender of the household head. It is indicated that 45.6% of the FHHs are at the 1st quintile as opposed to 39.3% in the 5th expenditure quintile while the figures for the 2nd, 4th and 3rd quintile is 41.3%, 39.8%, and 38.7%. On the other hand, for MHHs the trend shows that about 60.7% of the MHHs are at the 5th quintile and about 54.4% of them are in the 1st quintile.

As to marital status of the female head, it is shown that with the majority being widowed and divorced, poorer households tend to have widowed female head. However, the direction for the other forms does not imply certain trend.

There is a clear tendency that poorer household to be headed by illitrate male or female heads and the reverse holds for literate household heads. Thus, it is shown that about 71.5% of FHHs in the 1st quintile are illiterate while the figure for the 5th quintile is only 56.2%. For MHHs, on the other hand, about 31% are in the 1st quintile while it is 17.6% in the 5th quintile. At the same time, 69% of the male heads in the 1st quintile are literate as opposed to 82.4% in the 5th quintile while 28.2% of the literate FHHs are in the 1st quintile, it is 43.5% of them that are in the 5th quintile.

Table 4.8 Characteristics of Households by Expenditure Quintile

Characteristics	Quintile					
	1	2	3	4	5	All
Household Size	4.78	4.62	4.65	4.65	4.03	4.55
Dependency Ratio	1.02	0.90	0.84	0.76	0.6	0.83
Age of the household head	44.05	43.68	43.58	43.21	43.01	43.51
Household head is female (%)	45.6	41.3	38.7	39.8	39.3	40.9
Household head is male (%)	54.4	58.7	61.3	60.2	60.7	59.1
Unmarried female head (%)	10.0	8.5	7.5	8.0	8.8	8.6
Married female head (%)	16.6	19.1	16.2	21.4	19.9	18.6
Widowed female head (%)	41.9	42.9	43.4	40.4	38.9	41.5
Divorced female head (%)	24.6	22.2	26.5	21.3	23.0	23.5
Separated female head (%)	6.7	7.1	6.4	9.0	9.2	7.7
Illiterate female head (%)	71.5	63.5	66.5	59.3	56.2	63.6
Literate female head (%)	28.2	36.3	33.2	40.4	43.5	36.1
Illiterate male head (%)	31.0	26.8	21.5	20.1	17.6	23.2
Literate male head (%)	69.0	73.2	78.5	79.9	82.4	76.8

4.5. Nutritional Status of Children by Gender of the Household Head

In order to generate short and long run indicators of the nutrition status of children, we can use their relative height body and body weight. This is relevant indicator of the welfare status or level of deprivation and vulnerability of children because malnutrition threatens individuals by increasing vulnerability to morbidity. The two commonly used measures to compare nutritional status of children to some international standard are wasting and stunting. While wasting takes the weight of children, stunting takes the height of children over their ages between 3 and 60 and

compares it to the international standard. And doing the relevant calculations, if a z score of less than –2 is obtained, a child is classified as wasted (or stunted) and if a Z score of less than –3 is obtained it is classified as severely wasted (severely stunted). Wasting is seen as an indicator of short-term malnutrition for the weight of a child fluctuates with immediate changes in nutrient intakes; however since malnutrition causes slow growth, stunting is interpreted as a measure of long-term malnutrition.

Table 4.9. Nutritional Status of Children by Gender of the Household Head

Status of Children	Male (%)	Female (%)	Total (%)
Wasted	8.8	10	6.1
Severely wasted	4.1	4.6	1.5
Stunted	44.3	45.4	44.5
Severely Stunted	23.0	29.0	21.0

Table 4.9 shows that in the region 6.1% of children are wasted and 1.5% of children are severely wasted. The proportions of wasted and severely wasted children in FHHs are 10% and 4.6% respectively while it is 8.8% and 4.1% for MHHs. On the other hand, about 44.5% of children is stunted whereas 21.0% of children is severely wasted in the region. And in terms of the gender of the household head, in both MHHs and FHHs the proportion of stunted children are about 45% while the number of severely stunted children are 23% and 29% in MHHs and FHHs respectively.

4.6. Vulnerability of the Household Head by Gender

This section gives some insights on the vulnerability of households to shocks, their ability and ex-post mechanisms to overcome these shocks.

In order to assess the ability of households to cope up with shock, households were asked whether they could find 100 Birr within a week for unforeseen problems. And the information from this question is used to assess the ability of households to cope up with shocks. As it is indicated in Table 4.10, about 64.4% of the households in urban areas are able to find 100 Birr in a week to unforeseen problems and the proportion is slightly lower for FHHs (63%) than MHHs, showing that FHHs are slightly more vulnerable than MHHs. Therefore, it can be seen that quite large number of people (about 35% of the households) in the region are vulnerable or have less ability to cope up with shocks.

Table 4.10. Households Ability to Cope up with Shocks by Gender

Male	Female	Total
Proportion of Households [1]		
65.3%	63.0%	64.4%
Average Months [2]		
7.59	7.03	7.38

[1] the proportion of Households who can get 100 Birr in a Week for Unforeseen Problems,

[2] the average months households can live from the harvested crop if they are engaged in agricultural activities

In order to assess vulnerability of the few households engaged in agriculture in the region, they were asked for how many months they could live from own harvest. And the response shows that on average their harvests last only for 7 months, suggesting that they are vulnerable.

Table 4.11 summarizes the households' various ex-post risk coping mechanisms or sources where households can get the 100 Birr with in a week for unforeseen problems. And it could be seen that reserved money (29.6%), loan from relatives (23.5%) and loans from non-relatives (13.3%) are the main sources in their order. On the other hand, the role of banks and social organizations such as Ider and Equb is less in this respect.

Table 4.11. Sources to get 100 Birr for Unforeseen Circumstances in a Week

Sources to get the 100 Birr	Male (%)	Female (%)	Total (%)
Sale of Animal Product	3.3	3.0	3.1
Sale of agricultural Product	2.2	1.9	2.0
Sale of forest product	0.2	0.0	0.2
Reserved Money	29.9	29.3	29.6
Bank or Saving Account	5.4	4.1	4.9
Ekub	1.3	1.3	1.3
Ider	2.4	2.8	2.6
Bank Equivalent Loan	1.9	1.0	1.6
Loan from relatives	26.0	27.2	26.5
Gift from elatives	6.1	6.8	6.4
Loan from Non Relatives	12.7	14.2	13.3
Gift from Non Relatives	0.5	0.4	0.4
Sale of household's asset	2.8	3.0	2.9
Others	5.0	5.0	5.0
Total	100.0	100.0	100.0

4.7. Housing Characteristics of the Household Head by Gender

Another indicator of the well being of members of the society is their status of shelter. To that end, the survey assesses a number of variables relating to the dwellings of households. The first important piece of information is about the ownership of the dwellings where households currently reside. As it can be seen from Table 4.12, a total of 46.3% of the households in the country live in dwellings they themselves own. Accordingly, for both MHHs and FHHs the most dominant one is personal ownership of dwelling, followed by rented houses for Kebele and from

non-relatives. Therefore, in terms of the ownership structure of households' dwellings, we do not see any gender differences.

Table 4.12. Ownership Structure of Households' Dwellings (by Household Head)

Kind of Ownership of Dwelling	Male (%)	Female (%)	Total (%)
Owned	46.7	45.7	46.3
Subsidized by Employer	2.1	2.5	2.3
Subsidized by Relatives	2.5	2.7	2.6
Rented from Employer	.2	.3	.2
Rented from Governmental organization	2.5	1.9	2.1
Rented from kebele	24.3	25.8	25.0
Rented from Relative	1.1	1.0	1.1
Rented from Non relatives	19.3	19.1	19.2
Others	1.2	1.2	1.2
Total	100.0	100.0	100.0

However, before talking about the effects of such an ownership pattern on household welfare, we need to look into the types of houses that the households own. As it could be seen from Table 4.13, the average number of rooms available for the average household is only 2.3, which is almost the same for both MHHs and FHHs. Recalling the average family size of the country (4.55 persons), the average number of rooms per household is very low in urban areas. However, for FHHs with mean family size of 3.7, a mean number of rooms per household of 2.31 might not be too low as compared to MHHs with average family size of 5.11 and associated average number of rooms of 2.29.

Table 4.13. Housing Characteristics of the Household Head

	Male (%)	Female (%)	Total (%)
Mean Number of Rooms of Household Dwellings			
Mean	2.29	2.31	2.30
Types of Materials most of the Walls is made of			
Wood and Mud	76.9	75.9	76.5
Wood and cement	1.5	1.4	1.5
Bamboo or reed	1.3	.8	1.1
Mud and stone	5.7	8.7	6.9
Cement and Stone	6.1	6.0	6.0
Blocket	4.2	3.5	3.9
Bricks	.7	.6	.6
Others	3.7	3.1	3.4
Not Stated	.1	.1	.1
Types of Material most of the Roof is made of			
Corrugated Iron Sheet	85.4	87.7	86.3
Grass	7.2	6.3	6.8
Wood and Mud	1.6	2.0	1.8
Bamboo	.3	.3	.3
Others	5.4	3.6	4.7
Not stated	.0	.0	.0
Type of Lighting the Household Uses			
Kerosene	20.9	19.3	20.2
Electric Private	35.4	34.9	35.2
Electric Shared	42.5	44.8	43.4
Wood	.8	.5	.7
Candle	.2	.3	.2
Others	.2	.3	.2
Not Stated	.0	.0	.0
Type of Toilet the Household Uses			
Flush toilet private	4.4	3.9	4.2
Flush toilet Shared	3.7	4.4	4.0
Pit Latrine Private	36.1	34.2	35.3
Pit Latrine Shared	33.1	34.5	33.7
Bucket	.5	.7	.6
Field or Forest	21.4	21.8	21.6
Others	.6	.4	.6
Not Stated	.0	.1	.0

Important indicators of the quality of the houses in which people live are the materials with which they are constructed. Table 4.13 reveals that about 76.6% of the households' houses are made of wood and mud, which are low quality houses. Following that, mud and stone as well as

cement and stone walled houses are only for 6.9% and 6% of the households respectively. As it is very well seen from the table, this is also true if one looks this in terms of MHHs and FHHs separately again implying that most of them live in low quality houses. The information depicted in Table 4.13 further shows that a large proportion of the households (86.3%) live in the houses with corrugated iron sheet followed by grass-roofed houses. Again the same is true if we see the roof characteristics of the households' dwellings by gender of the head.

Looking into the type of lighting the household uses, Table 4.13 presents that electricity followed by kerosene is the major source of lighting with 78.6% and 20.2% of the households using them respectively. However, about 43.4% of the households use shared electric connection. Seen in terms of gender of the household head, again the same type of lightings dominates.

Finally, if one looks through the type of toilets used by the households, it is indicated in Table 4.13 that about 69% of the households use both shared and private pit latrine. Following this, about 21.6% and 8.2% of the households use forests and fields as well as flush toilets respectively. The situation is the same for both MHHs and FHHs.

In general, it has been seen that both the ownership type and housing characteristics are almost the same for both MHHs and FHHs in urban areas.

4.8. Ownership of Household Durables by Gender of the Head

Another welfare indicators are the ability of households to obtain information and improved mobility of people. As a proxy to the availability of information the survey contains information on the ownership of television and radio sets. With this respect it is found that it is only about 16.5% of the households who have access to television. The picture seems better when we consider ownership of radio sets, in which about 64.4% of the households own radio sets. With in these all, there is no difference in terms of the proportion of MHHs and FHHs who own these durables.

Table 4.14. Ownership of Sources of Information and Mobility

Household Durable	MHH (%)	FHH (%)	Total (%)
TV	16.8	16	16.5
Radio	65.5	62.9	64.4
Bicycle	6.7	5.4	6.1
Motor vehicle	1.4	1.3	1.4

Table 4.14 further shows that ownerships of bicycle and motor vehicle are very low in the country at large and hence to both MHHs and FHHs with no that much difference.

Chapter Five

RESULTS AND DISCUSSIONS

5.1. The Extent of Poverty

In this section, we look into the extent of poverty on FHHs in urban Ethiopia in a way making comparisons with their male counterparts. And this will be done using the different poverty lines in terms of various household characteristics such as age, household size, literacy, and schooling.

The estimated poverty indices for urban Ethiopia are presented in Table 5.1. Based on total poverty line, absolute head count index stood at about 43% indicating that on the average 43% of the urban population in Ethiopia is unable to meet the stipulated minimum level of calorie intake i.e. 2200 Kcal per adult equivalence per day. The proportion is even higher, 57%, when considering moderate head count index but lower, 24%, in terms of extreme head count index.

Table 5.1. Poverty Indices in Urban Ethiopia

Poverty Indices	Moderate Poverty Index		Absolute Poverty Index		Extreme poverty Index	
	Index	SE	Index	SE	Index	SE
Total Poverty Index						
P_0	0.57	0.005	0.42	0.005	0.24	0.004
P_1	0.20	0.002	0.13	0.002	0.06	0.001
P_2	0.10	0.001	0.05	0.000	0.02	0.000
Food Poverty Index						
P_0	0.67	0.005	0.52	0.005	0.32	0.005
P_1	0.26	0.002	0.17	0.002	0.08	0.001
P_2	0.13	0.001	0.07	0.002	0.03	0.000

Po=head count index; P_1=poverty gap; P_2=squared poverty gap index (or Poverty severity), SE= Standard error of the index

The poverty gap which is the percentage of total consumption needed to bring the entire population below at least at the poverty line is found to be 13% in terms of absolute poverty line

and 20% and 6% in the case of moderate and extreme poverty gaps respectively. The severity of poverty is about 5% while it is 10% and 2% if we consider moderate and extreme poverty lines.

Coming to food poverty indices, the share of the population whose consumption expenditure is below the absolute food poverty line is 52%, which is 10% greater than the proportion of people who are under absolute total poverty. The proportion is also higher for moderate and extreme food poverty indices as compared to total poverty considered earlier. These all may be because people spend most of their income on food items. The food poverty gap indicates that the households are 17% far off from the absolute food poverty line and 26% and 8% from the moderate and extreme poverty lines respectively, and all are higher than total poverty gap considered earlier. The severity of poverty is also worse as compared to the case in total poverty. It is indicated to be 7%, 13% and 3% for absolute, moderate and extreme poverty lines respectively.

Table 5.2 compares the extent of poverty across the gender of the household heads. It is shown that about 46.8% of FHHs in urban Ethiopia are below the absolute total poverty line, while about 59.4% and 29.8% of them are below the moderate and extreme poverty lines respectively. The extent is worse in terms of the food poverty lines, i.e., about 60.3% of the FHHs in urban Ethiopia are food poor in terms of absolute food poverty lines whereas about 71% and 43.9% of these households are moderately and extremely food poor in terms of these poverty lines respectively.

Table 5.2. Poverty Indices by Gender of the Household Head in Urban Ethiopia

		Male headed		Female headed		t-value+
		Index	SE	Index	SE	
Total Poverty Indices						
Absolute Poverty Index	Po	0.419	0.006	0.468	0.0083	2.95**
	P_1	0.135	0.002	0.168	0.0039	4.32***
	P_2	0.062	0.001	0.082	0.0025	4.64***
Moderate Poverty Index	Po	0.552	0.006	0.594	0.0082	2.21*
	P_1	0.206	0.003	0.242	0.0044	4.10***
	P_2	0.101	0.002	0.127	0.0030	4.55***
Extreme Poverty Index	Po	0.241	0.005	0.298	0.0076	3.61***
	P_1	0.071	0.002	0.096	0.0031	4.57***
	P_2	0.029	0.001	0.043	0.0018	4.55***
Food Poverty Indices						
Absolute Poverty Index	Po	0.509	0.006	0.603	0.0082	6.13***
	P_1	0.187	0.003	0.257	0.0046	8.20***
	P_2	0.092	0.002	0.144	0.0034	8.68***
Moderate Poverty Index	Po	0.640	0.006	0.710	0.0076	5.17***
	P_1	0.265	0.003	0.338	0.0049	8.01***
	P_2	0.141	0.002	0.200	0.0038	8.62***
Extreme Poverty Index	Po	0.341	0.006	0.439	0.0083	6.24***
	P_1	0.108	0.002	0.168	0.0041	8.35***
	P_2	0.049	0.001	0.088	0.0028	8.61***

Po=head count index; P_1=poverty gap; P_2=squared poverty gap index (or Poverty severity), SE= Standard error of the index

+ Test statistics for the difference in poverty index between male and female headed households.

*, **, and *** significant at 10%, 5%, and 1% respectively.

The depth of poverty as indicated by the poverty gap indices shows that with respect to total poverty, FHHs are 16.8% far off from the absolute total poverty line, whereas they have 24.2% and 9.6% mean consumption shortfalls relative to the moderate and extreme total poverty lines. The result also indicates that the severity of poverty among FHHs is 8% in the case of absolute total poverty, and it is 12.7% and 4.3% in the case of moderate and extreme total poverty respectively. In terms of food poverty lines, the result shows that the depth and severity of poverty get worse just like the other cases considered earlier.

Comparisons between female and male-headed households shows that in terms of all the poverty indices considered for both total and food poverty lines, there is considerable differences in the extent of poverty among female and male headed households. All the indices are higher for FHHs than MHHs, and as shown by the t-value all of these differences are statistically significant mostly at 1% and in some cases at 5% and 10% level of significance. However the magnitude of the differences varies among the different poverty lines considered. The result reveals that the magnitude of the difference is smaller when we consider total poverty rather than food poverty. It is indicated that in terms of total poverty, the absolute head count index is only 5% more for FHHs than MHHs, whereas in the case of food poverty index the difference is about 10%. The same holds for moderate and extreme head count ratios. The poverty gap indices also show that in terms of total poverty, the absolute poverty gap index is only 3% higher for FHHs as compared to MHHs, while it is about 7% more in the case of food poverty index. Again we observe more or less similar difference for moderate and extreme poverty gap indices. The difference in terms of the severity of poverty also gets higher in the case of food poverty severity, i.e., 5% higher in the case of absolute severity of food poverty while it is 2% more in the case of absolute severity of total poverty.

When comparing poverty measures over time or group, using stochastic dominance technique can help in establishing the robustness of poverty comparison using summary measures. To that end, Figure 5.1, 5.2 and 5.3 present the stochastic dominance analysis for the poverty comparisons between FHHs and MHHs.

Figure 5.1. Comparisons of Poverty Incidence between FHHs and MHHs

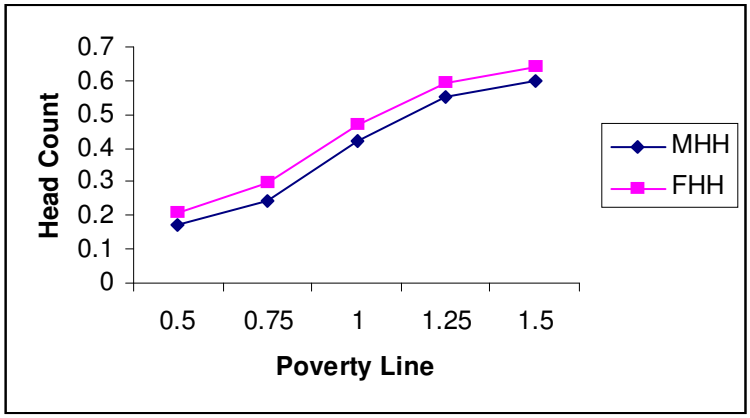


Figure 5.2. Comparisons of Poverty Intensity between FHHs and MHHs

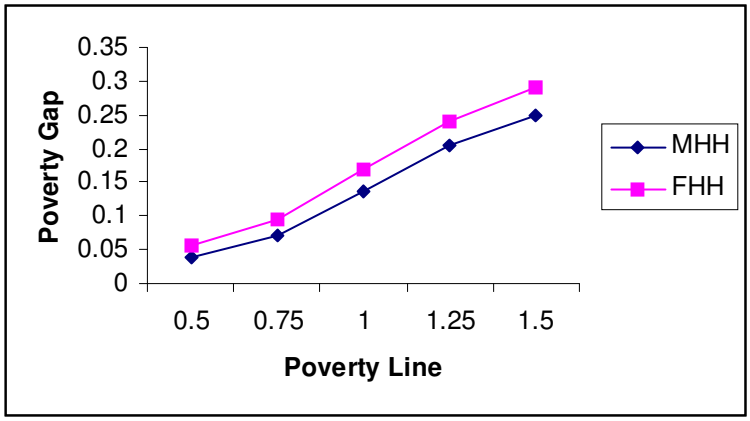
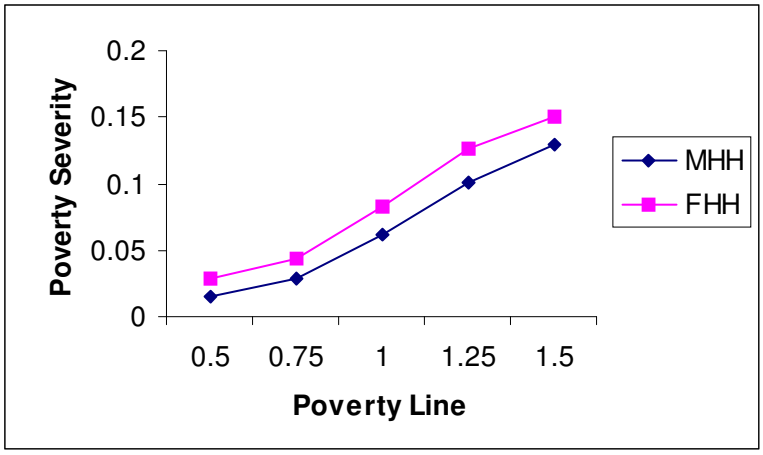


Figure 5.3. Comparison of Poverty Severity between FHHs and MHHs



As it is shown from the graphs, the incidence, depth and severity of poverty are drawn across multiples of poverty lines (0.5,0.75,1.00,1.25,1.5) for both MHHs and FHHs in one graph to conduct stochastic dominance analysis. And at all levels of these poverty lines, the incidence, depth and severity of poverty indices of MHHs are far below than that of FHHs verifying that consumption poverty is consistently higher for FHHs than MHHs. It is to be noted that the stochastic dominance analysis reveals the same result as the statistical test.

Therefore, given these results one can conclude that FHHs experience more poverty than their male counterparts. This is expected because as it is shown in the descriptive analysis, FHHs are endowed with less physical and human capital. That is, they are more illiterate and unemployed, mostly concentrating on domestic services; and most of them are engaged in informal sector activities that are mostly low paying.

Table 5.3 compares household size and poverty status across male- and female-headed household. And it is shown that the incidence, depth and severity of absolute total as well as food poverty are increasing with increasing family size for both FHHs and MHHs. This might be because of the observed higher dependency ratio (0.83) within household. The comparison in the poverty status of FHHs and MHHs reveals that based on the total and food poverty lines, FHHs are poorer than MHHs in all the three family size categories considered. However, the t- values indicate that the differences are not significant in terms of the total poverty line while it is significant in most of the cases when we consider food poverty line.

Table 5.3. Poverty Comparison by Household Size

Household Size	MHHs			FHHs			t-value+		
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
Total Poverty Line									
Single Person	0.56	0.22	0.12	0.56	0.25	0.14	0.35	1.30	1.65
Medium: 2-5	0.43	0.14	0.07	0.47	0.16	0.08	2.0*	4.14***	4.38***
Large: 6 & +	0.38	0.10	0.04	0.37	0.11	0.04	2.1*	0.30	0.46
Food Poverty Line									
Single Person	0.76	0.40	0.25	0.84	0.52	0.37	4.58***	5.93***	5.98***
Medium: 2-5	0.54	0.20	0.10	0.61	0.25	0.13	4.10***	5.04***	5.43***
Large: 6 & +	0.43	0.13	0.05	0.47	0.15	0.07	0.44	1.9*	2.4*

Po=head count index; P_1=poverty gap; P_2=squared poverty gap index (or Poverty severity),
+ Test statistics for the difference in poverty index between male and female-headed households.
*, **, and *** significant at 10%, 5%, and 1% respectively.

Another important demographic characteristic is marital status. As it is indicated in Table 5.4, comparisons on the poverty status of FHHs and MHHs are made between households with different marital status. And it is shown that, using the two poverty lines considered, FHHs are poorer compared to MHHs in single, married and widowed categories whereas MHHs in separated and divorced categories are poorer than FHHs. The result further shows that the incidence, depth and severity of poverty based on the two poverty lines are lower for married FHHs and MHHs as compared to the other categories considered. On the other hand, among the FHHs, those households headed by single females are over represented among the poor.

Table 5.4. Poverty Comparison by Marital Status of the Head

Marital Status	MHHs			FHHs		
	P_0	P_1	P_2	P_0	P_1	P_2
Total Poverty Line						
Single	0.46	0.16	0.07	0.49	0.18	0.09
Married	0.40	0.12	0.05	0.45	0.14	0.06
Widowed	0.45	0.14	0.06	0.47	0.16	0.08
Divorced	0.56	0.21	0.10	0.46	0.18	0.09
Separated	0.59	0.23	0.12	0.43	0.15	0.07
Food Poverty Line						
Single	0.62	0.28	0.16	0.65	0.30	0.17
Married	0.49	0.17	0.08	0.53	0.19	0.09
Widowed	0.53	0.19	0.09	0.59	0.25	0.14
Divorced	0.58	0.28	0.16	0.64	0.30	0.17
Separated	0.73	0.37	0.23	0.62	0.25	0.14

Table 5.5 and 5.6 present the estimates of the poverty indices across the different level of education of the head. In terms of literacy status, poverty incidence, depth and severity have been higher for illiterates than for the literates for both FHHs and MHHs. Poverty incidence in terms of total poverty line has been higher for the illiterates than that of literates by 21% and 34% for FHHs and MHHs respectively whereas it is 16% and 10% higher in the same order in terms of food poverty indices. On the other hand, the extent of poverty is higher for those illiterate FHHs compared to illitrate MHHs.

Table 5.5. Poverty Comparison by Literacy Status of the Head

Literacy Status	MHHs			FHHs			t-value		
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
Total Poverty Line									
Illiterate	0.51	0.17	0.08	0.50	0.18	0.09	0.50	2.31	2.93
Literate	0.38	0.12	0.05	0.41	0.13	0.06	1.30	1.88	2.13
Food Poverty Line									
Illiterate	0.58	0.23	0.11	0.63	0.27	0.16	3.39	4.78	5.54
Literate	0.48	0.17	0.08	0.54	0.21	0.11	2.42	1.28	0.37

Table 5.6 further shows that in terms of both poverty lines, poverty incidence, depth and severity decline as the level of education of the household head increases for both MHHs and FHHs. This is expected because education is one of the key determinants of poverty: people with higher levels of educational attainment improve their chance of obtaining a better means of income.

Table 5.6. Poverty Comparison by Education Level of the Head

Schooling	MHHs			FHHs		
	P_0	P_1	P_2	P_0	P_1	P_2
Total Poverty Index						
No grade	0.46	0.14	0.06	0.39	0.13	0.06
Grade 1-3	0.44	0.15	0.07	0.54	0.19	0.09
Grade 4-6	0.41	0.13	0.05	0.46	0.14	0.06
Grade 7-8	0.43	0.13	0.05	0.41	0.12	0.05
Grade 9-11	0.39	0.13	0.06	0.46	0.17	0.09
Grade 12	0.34	0.10	0.04	0.30	0.09	0.03
Certificate	0.34	0.12	0.06	0.33	0.11	0.04
Higher Education	0.30	0.09	0.03	0.23	0.08	0.03
Food Poverty Index						
No grade	0.51	0.18	0.08	0.63	0.27	0.15
Grade 1-3	0.58	0.22	0.11	0.53	0.20	0.09
Grade 4-6	0.54	0.18	0.09	0.67	0.30	0.17
Grade 7-8	0.50	0.18	0.08	0.59	0.22	0.11
Grade 9-11	0.51	0.19	0.09	0.51	0.20	0.10
Grade 12	0.44	0.15	0.07	0.46	0.18	0.09
Certificate	0.41	0.15	0.07	0.49	0.15	0.06
Higher Education	0.37	0.12	0.06	0.31	0.10	0.04

An alternative way to present a poverty profile consists in assessing how various household groups contribute to the overall poverty in the country. The contribution of a household group to overall poverty is a function of that group's population share and the extent of poverty in the group. To that end, the contribution of FHHs and MHHs total poverty is summarized in Table 5.7.

Table 5.7. The Percentage Contribution of Household Heads to Poverty

Poverty Measure	Total Poverty		Food Poverty	
	MHH (%)	FHH (%)	MHH (%)	FHH (%)
Head-count ratio	57	43	56	44
Poverty Gap	54	46	62	38
Poverty Severity	60	40	66	34

In both food as well as total poverty lines, the contribution of FHHs to total poverty is smaller compared to MHHs in all poverty measures considered.

5.2. The Extent of Vulnerability to Poverty

Using the method specified in the methodology part of this paper, we generate an estimate of vulnerability for each household. The poverty line used in the estimation is the already described absolute total poverty line. The results summarize the mean vulnerability (i.e., the probability that a household will be vulnerable), and amongst the vulnerable we distinguish those whom we term the relatively vulnerable (i.e., those who have an estimated vulnerability level greater than the observed incidence of poverty but less than 0.5); and those whom we term the highly vulnerable because we estimate that they are more likely than not to experience poverty (i.e., those who have an estimated vulnerability level greater than 0.5) .

Table 5.8 summarizes the gender dimensions of vulnerability to poverty. We begin with gender dimension of vulnerability to poverty, FHHs are over represented among the vulnerable relative to MHH, i.e., FHHs account for 47% of the vulnerable as opposed to 39% of MHHs. The mean

vulnerability to poverty shows that households headed by females are more likely (32%) to be vulnerable than MHHs (24%).

Table 5.8. Vulnerability to Poverty by Gender of the Head

Gender of the Household Head	Mean Vulnerability	Share of Vulnerable	Share of the Poor	Share of Highly Vulnerable
MHH	0.24	0.39	0.41	0.51
FHH	0.32	0.47	0.46	0.63
ALL	0.31	0.45	0.42	0.68

When households are split along marital status of the head, Table 5.9 shows the mean vulnerability to poverty is higher for FHHs in all-marital status. Vulnerability to poverty is relatively higher for single and widowed FHHs.

As it is shown, in Table 5.9 the correlation of educational attainment of the household head and vulnerability is found to be vague in which we do not see any defined pattern of their relationship. However, it is to be noted that the rate of vulnerability is higher for FHHs who are at lower level of education than higher educational attainments. Besides since we do not see as such exaggerated variations on their mean vulnerability, MHHs at lower level of education are as likely vulnerable as those at the other end of education level.

Table 5.9. Vulnerability to Poverty by Household Characteristics

	Mean Vulnerability	
	MHH	**FHH**
Marital Status of the head		
Single	0.31	0.50
Married	0.30	0.31
Widowed	0.36	0.41
Divorced & separated	0.14	0.32
Education Level of the head		
Illiterate	0.32	0.30
No grade	0.30	0.29
Grade 1-3	0.31	0.33
Grade 4-6	0.27	0.23
Grade 7-8	0.31	0.28
Grade 9-11	0.31	0.26
Grade 12	0.33	0.16
Certificate	0.32	0.14
Higher Education	0.30	0.15
Employment Status of the Head		
Unemployed	0.32	0.37
Formal sector employee*	0.29	0.27
Informal sector employee**	0.31	0.30
Formal sector self-employed	0.31	0.32
Informal sector self-employed	0.33	0.34

Similarly, if we divide up the sample according to the employment status of the household head, we find that the vulnerability to poverty is higher for unemployed household heads for both MHHs and FHHs. Among the employed household heads, the vulnerability to poverty is lower for employees in the formal sector whereas it is higher for those employed in the informal sector as well as the self-employed ones both in the case of FHHs and MHHs. It is further shown that vulnerability to poverty is higher for unemployed FHHs than unemployed MHHs, the rest not having as such differences.

The other demographic variable to be considered is household size; it is revealed that the higher the household size, vulnerability of the household to poverty will be higher.

Table 5.10. Vulnerability of Households by Household Size

Household Size	Mean Vulnerability
Single person	0.17
Medium: 2-5 persons	0.23
Large: 6 and above persons	0.32

5.3. Determinants of Poverty

Multivariate econometric analysis helps us identify factors influencing the extent of poverty. To that end, OLS, probit, ordered probit and censored tobit models have been adopted.

But before estimation was done, data exploration is an important step. To start with, a simple correlation coefficient matrix was conveyed in order to test whether multicollinearity is present or not. Gujarati (1995) establishes a rule of thumb, which says that multicollinearity is a serious problem when the correlation coefficient is 0.8, or above. The statistics indicates that though correlation is present, with the exception of the correlation between age and age squared which is high as expected, multicollinearity is not as such a serious problem in our data. And this is an indication that each variable in the model captures a distinct feature of poverty.

A test for heteroscedasticity was detected. The Cook-Weisberg output shows that, in fact heteroscedasticity problem is inherent in our data. To that end, even if it is not the ultimate solution, we have tried to use the Stata command robust when each of the estimations was made.

As to the estimated results, overall in all cases, the statistical significance of the various parameters differs widely across variables and except few exceptions, the signs of the estimated variables are as expected with reasonable relative magnitudes. As it can be seen from the results of the different regression models, some are statistically significant at 1%, 5% and 10% level of significance while others are not significant even at 10% level of significance. For the sake of completeness, the reports of the estimated results in all cases include non-significant variables at 10% level of significance.

5.3.1. Determinants of Consumption Expenditure (OLS result)

Following the theoretical discussions, households welfare function (proxied by household expenditure functions) are estimated using ordinary least square model. The resulting estimates are presented in Table 5.11. It can be noted that the dependent variable of the model is the natural logarithm of real consumption per adult equivalence, and hence the estimated regression coefficients measure the percentage change in real consumption per capita for a unit change in the explanatory variable. The F-value, 64.04, shows that the overall model for the estimates of the OLS regression as a good fit. The fit of the model is good, with R-square 0.25.

Different explanatory variables explaining the demographic characteristics of the household have been included in the regression. According to the estimated results, holding other variables constant, female headship as compared to male-headship does not have a significant impact on the welfare status of households. This suggests that, unlike the general expectation, FHHs are not poorer than MHHs in urban Ethiopia. And note that in the poverty profile it has been showed that FHHs are more likely to be poor than MHHs in all the three poverty indices for the considered poverty lines. And the differences in the results might stem from the fact that in

regression models we control for the level of the other variables whereas poverty profile does not, thus, the regression analysis is comparing male and female headed household with the same characteristics while average FHHs and MHHs do not have the same value for these covariates.

Other things being equal, being single female head (i.e. unmarried, widowed, separated or divorced) reduces the household's living standard relative to married FHHs. And this is significant at 10% level of significance. This is even more significant for MHHs (1%), in which married MHHs are better off as compared to single male heads.

The age of the head does not have a significant influence on the living standard of the households. The insignificance of the age variable may be due to the fact that other family members who are in the productive age group may take care of the living standard of the elderly household heads. On the other hand, the estimated coefficient of the quadratic term of age is found to be positive and statistically significant, suggesting a U-shaped relationship between consumption per adult equivalence and age of the household head. This implies that as the age of the head increases, welfare reduces at a decreasing rate.

Another demographic variable to be of concern is household size. The estimated parameters for household size that have been disaggregated by age, reveal a very significant negative relationship between number of children who are under 14 (both in 0 to 7 years old age and 8 to 14 years of age categories) and consumption expenditure per adult equivalent. However, the coefficient is positive and statistically significant at 1% level for adults (people with between the age of 14 and 65) while it is insignificant for elderly people with the age above 64. Therefore, according to the regression estimates, taking care of the effects of all other variables, an

additional child (age under 14) in the household reduces the living standard of the household while an additional adult has the opposite effect. This may go with the intuitive appeal that adults are taken to be in a productive age category in which they can support the households, hence have a positive effect on the living standard of the household.

As presented in Table 5.11, all the education dummies are found to be significant for both MHHs and FHHs. Schooling of female heads affects the welfare status of households positively relative to illiterate FHHs. This is even more significant for MHHs, in that male heads who are with and above primary education have a positive association with welfare of the households relative to illiterate MHHs and this is significant at 5% and 1% level of significance in the case of primary education and the rest of the education categories respectively. Therefore, we can see that the effect of education is especially strong for MHHs.

In general, most of the employment dummies are found to be insignificant for MHHs than FHHs. Employment of FHHs in the formal sector has no significant effect on the living standard of the households as compared to those who are unemployed. However, FHHs employed in the informal sector affects the welfare of the household negatively at 1% level of significance. Conversely, relative to the an unemployed female head, it is shown that self–employed FHHs affect the welfare of the household positively at 5% level of significance. However, all the employment dummies for MHHs are found to be insignificant.

In terms of regions, it has been observed that within the urban areas living standards are significantly higher for households who reside in Harrari, Addis Ababa and Dire Dawa than in the rest of the urban regions.

Table 5.11. Results from OLS regression (Modeling the Welfare Function)

Log of real consumption per adult equivalence (dependent variable)	Robust Coefficient	Std. Err.	t-value	P>t
SEX	0.047462	0.034752	1.37	0.172
SINGLEF	-0.04907	0.025173	-1.95*	0.051
SINGLEM	-0.09265	0.023511	-3.94***	0
AGE	-0.017042	0.017959	-0.95	0.343
AGESQ	1.5E-05	9.17E-06	1.65*	0.099
CHILD0_7	-0.09961	0.007899	-12.61***	0
CHILD7_14	-0.21757	0.007826	-27.8***	0
ADULT	0.036661	0.004092	8.96***	0
OLD	-0.023273	0.020174	-1.15	0.249
GR1_6F	0.057238	0.031497	1.82*	0.069
GR7_11F	0.101226	0.033634	3.01**	0.003
GR_12F	0.177132	0.040072	4.42***	0
HIEDUF	0.142983	0.059841	2.39*	0.017
GR1_6M	0.059497	0.022449	2.65**	0.008
GR7_11M	0.091215	0.022933	3.98***	0
GR_12M	0.137991	0.027313	5.05***	0
HIEDUM	0.205384	0.028241	7.27***	0
FORMEMPF	0.005425	0.034892	0.16	0.876
INFEMPF	-0.15962	0.037292	-4.28***	0
SELFF	0.108905	0.03719	2.93**	0.003
FORMEMPM	0.019957	0.02416	0.83	0.409
INFEMPM	-0.0167	0.022157	-0.75	0.451
SELFM	0.018935	0.023759	0.8	0.425
CITY	0.05089	0.014621	3.48**	0.001
_CONS	7.286867	0.036732	198.38***	0

Tests are for whether the coefficient differs from zero.
* Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Test Summary:

```
Number of observations = 8669
F (24, 8644)= 64.04
Prob > F = 0.0000
R-squared = 0.2544
Root MSE = .56455
```

5.3.2. Determinants of Poverty Incidence (Probit Model)

The probit model helps us identify the determinants that explain the probability that a household is poor. Therefore, based on absolute total poverty line, we look through factors that determine the household head to fall below this poverty line. Most of the probit results are consistent with OLS results. However, inconsistency can be also observed due to the sensitivity of the dependent variable under probit to the poverty line adopted. For the estimates of the probit model, the chi-square statistic of the Likelihood Ratio shows the overall model as a good fit.

The same as the estimation from welfare function, probit result also shows that compared to male headship; female-headship has no significant influence on the poverty incidence of households. As to the marital status of the head, unlike the welfare function, the result shows that single female head does not have significant influence on the probability of the household to be poor whereas controlling for the effects of other variables, married MHHs decreases the poverty incidence on the households relative to single MHHs at 5% level of significance.

Age of the household head is insignificant while age-square decreases the likelihood of the household being poor at 10% level of significance. On the other hand, the household size as explained by the number of people in the various disaggregated age groups appear to have significant influence on the incidence of poverty. Higher proportions of household members who are children and elderly (therefore higher dependency ratio in general) significantly increase the probability of the household to fall into poverty at 1% and 10% level of significance respectively. On the other hand, the number of adults in the household decreases the likelihood of the household to be poor. Hence, other things being equal, for an additional adult member of the household, the incidence of poverty declines by 2%.

The result further shows that relative to illiterate female heads, the probability of the household to be poor is lower for FHHs with and above 12^{th} grade level of education at 5% and 10% level of significance respectively. However, the fact that these household heads are with primary and secondary school education level does not affect the likelihood of the household to be poor. Conversely, the education dummy for MHHs retains to be significant indicating that MHHs with any level of schooling as compared to illiterate male heads reduce the likelihood of the household to slip into poverty.

The same as the OLS result, most of the coefficients for employment are found to be insignificant. Formal sector employed MHHs and FHHs have not a significant influence on the probability of being poor. It is shown that female heads working as an employee in the informal sector increase the likelihood of falling into poverty at 10% level of significance. Conversely, FHHs and MHHs working as a self-employed have insignificant influence on the depth of poverty for the household.

As to the location variable, household head living in urban areas other than Harari, Addis Ababa and Dire Dawa are positively related with the incidence of poverty relative those in these three regions.

Table 5.12. Results for Probit Model (Modeling Poverty Incidence)

P_0 (Probability of being poor-dependent variable)	Coefficient	dF/dX	Robust Std. Err.	Z	P>z
SEX[+]	-0.0444	-.01564	0.0814	-0.55	0.585
AGE	-0.0235	-.00831	0.0434	-0.54	0.588
AGESQ	0.0000	.00001	0.0000	1.65*	0.098
CHILD0_7	0.1606	.05668	0.0186	8.62***	0
CHILD7_14	0.3860	.13621	0.0183	20.99***	0
ADULT	-0.0600	-.02119	0.0104	-5.76***	0
OLD	0.0860	.03051	0.0497	1.74*	0.082
SINGLEF[+]	-0.0048	-.00169	0.0593	-0.08	0.935
SINGLEM[+]	0.1794	.06542	0.0549	3.27**	0.001
GR1_6F[+]	-0.0402	-.01408	0.0713	-0.56	0.572
GR7_11F[+]	-0.1194	-.04094	0.0760	-1.57	0.116
GR_12F[+]	-0.3406	-.10924	0.1065	-3.2**	0.001
HIEDUF[+]	-0.3762	-.11880	0.1594	-2.36*	0.018
GR1_6M[+]	-0.1592	-.05441	0.0544	-2.93**	0.003
GR7_11M[+]	-0.2030	-.06872	0.0567	-3.58***	0
GR_12M[+]	-0.2871	-.09453	0.0687	-4.18***	0
HIEDUM[+]	-0.4596	-.14436	0.0716	-6.41***	0
FOREMPM[+]	-0.0636	-.02227	0.0589	-1.08	0.28
INFOREMPM[+]	0.0354	.01256	0.0540	0.66	0.512
SELFM[+]	-0.0561	-.01967	0.0570	-0.98	0.325
FOREMPF[+]	-0.0439	-.0153	0.0827	-0.53	0.595
INFOREMPF[+]	0.2082	.07570	0.082	2.52*	0.012
SELFF[+]	-0.1339	-.04619	0.0823	-1.63	0.104
CITY[+]	-0.1146	-.03981	0.0358	-3.2**	0.001
_CONS	-0.5077		0.0872	-5.82***	0

[(+)] dy/dx is for discrete change of dummy variable from 0 to 1.

Tests are for whether the coefficient differs from zero
* Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Test of Summary:

```
Number of observations = 8669
Wald chi2 (24)= 781.55
Prob > chi2    = 0.0000
Log likelihood = −5005.0655
Pseudo R2 = 0.1815
```

5.3.3. Determinants of Extreme Poverty (Ordered Probit Model)

Following the theoretical discussion in the methodology part, we have divided the dependent variable into three categories: non-poor, absolutely poor and hard-core (extremely poor) based on the relevant total poverty lines. This is because the model makes us focus not only on the poor but also on the hardcore poor. The estimated results for the ordered probit model, as given by Table 5.13, are more or less similar to the binominal probit model. In general, it is to be noted that the factors that are important in the binomial model are still important with the same effect in the ordered model. However, this model allows us look through the marginal effects on the probability of being extremely poor. For the estimates of the ordered probit model, the chi-square statistic of the Likelihood Ratio shows the overall model as a good fit.

As it has been found before in the probit model, the impact of female head on the probability of falling into poverty still retains to be insignificant. Besides, in terms of the marital status of the head, the result shows that being a single female head does not necessarily lead to higher probability of poverty. As to the marital status of male heads, it is indicated that being a single male head have a positive sign with a marginal effect of 4% for the probability falling into extreme poverty.

Age square affects the incidence of falling into poverty at 10% level of significance while its marginal effects are almost nil for all of the poverty categories considered. Household size as explained by the various age disaggregations remains significant at different levels. Looking at the marginal effects, other things being equal, an additional child on the age of 0 to 7 and 8 to 14 increases the probability of extreme poverty by 4% and 10% respectively as opposed to 2% and 4% in the case of absolute poverty. Similarly, taking care of the effects of all other variables, one

more elderly (age above 64) person in the family also increase the probability of falling into extreme poverty by 5% as opposed to 2% in the case of absolute poverty. On the other hand, citrus paribus, having an additional adult in the household reduces the likelihood of being extremely poor.

Almost all the education dummies are seen to be significant implying that controlling for other variables, as compared to illiterate male and female head, male and female headed households with some level of education reduce the probability of falling into poverty respectively. On the other hand, unlike in the binomial probit model, the education dummies give no marginal effect for the probability of falling in any of the poverty categories we have considered.

Contrary to the OLS and binomial probit models, the employment dummies are somewhat relatively significant in this case. In terms of the marginal effects, other things being equal, relative to unemployed female head, informal sector employee female head increases the probability of extreme poverty by 7% and the marginal effect for probability of falling into absolute poverty is 9%. Whereas if female head is self-employed, it has a negative impact on the likelihood of falling into poverty with marginal effects, 2% and 4% for absolute and extreme poverties respectively. For MHHs, other things being equal, relative to unemployed MHHs, being employed in the formal sector reduces absolute and extreme poverty levels of the household by 2% and 5% respectively. Being a self-employed male head also has a negative impact on the probability of falling into poverty at 10% level of significance.

The location variable is also highly significant at 1% level, in which the marginal effect indicates that other things being equal, living in Harari, Addis Ababa and Dire Dawa, reduces the probability of being extremely and absolutely poor by 5% and 2% respectively.

The ordered probit model also gives us the probability of falling into the non-poor category, into the absolutely poor, and into the extremely poor category. To that end, as indicated in Table 5.13, the probability of falling into the non-poor category is found to be 67% while the probability of being absolutely poor and extremely poor are 14% and 17% respectively. Hence, households are more likely to be extremely poor than absolutely poor. And in most of the cases, the marginal effect for the extreme poverty is higher than for absolute poverty.

Table 5.13. Results from Ordered Probit (Modeling Extreme Poverty)

P (Probability of being poor-dependent variable)	Coefficient	dy/dx_1 (non-poor)	dy/dx_2 (absolutely poor)	dy/dx_3 (extremely poor)	Z	P>z
SEX+	-0.067	.02453	-.0074	-.01709	-0.88	0.381
AGE	-0.031	.01127	-. 00339	-.00787	0.75	0.45
AGESQ	0.000	-.00001	0.000	0.000	1.67*	0.096
SINGLEF+	0.030	-.01104	.00330	.00774	0.54	0.588
SINGLEM+	0.175	-.06567	.01797	.04769	3.36**	0.001
CHILD0_7	0.153	-.05576	.01679	.03897	8.76***	0
CHILD7_14	0.380	-.13817	.04160	.09657	22.33***	0
ADULT	-0.069	.01104	-.00330	-.00774	-6.95***	0
OLD	0.082	-.06567	.01797	.04769	1.72*	0.086
GR1_6F+	-0.061	(no effect)	(no effect)	(no effect)	-0.91	0.364
GR7_11F+	-0.130	(no effect)	(no effect)	(no effect)	-1.79*	0.074
GR_12F+	-0.354	(no effect)	(no effect)	(no effect)	-3.48**	0.001
HIEDUF+	-0.319	(no effect)	(no effect)	(no effect)	-2*	0.046
GR1_6M+	-0.143	(no effect)	(no effect)	(no effect)	-2.79**	0.005
GR7_11M+	-0.200	(no effect)	(no effect)	(no effect)	-3.74***	0
GR_12M+	-0.276	(no effect)	(no effect)	(no effect)	-4.21***	0
HIEDUM+	-0.434	(no effect)	(no effect)	(no effect)	-6.32***	0
FOREMPM+	-0.094	.07505	-.02287	-.05217	-1.67*	0.095
INFOREMPM+	0.060	-.04585	.01246	.0333	1.18	0.237
SELFM+	-0.104	.04925	-.01471	-.03453	-1.91*	0.056
FOREMPF+	-0.053	.06569	-.0206	-.04505	-0.66	0.507
INFOREMPF+	0.230	-.09644	.02463	.071806	2.88**	0.004
SELFF+	-0.177	.05631	-.01708	-.03923	-2.22*	0.027
CITY+	-0.109	.0703	-.02136	-.04900	-3.17**	0.002
_CUT1	0.4453	0.08384	(Ancillary parameters)			
_CUT2	0.6442	0.08455				

(+) dy/dx is for discrete change of dummy variable from 0 to 1.

Tests are for whether the coefficient differs from zero
* Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

```
Number of observations= 8669
Wald chi2 (24) = 880.39
Prob > chi2 = 0.0000
Log likelihood = -6886.3447
```

Predicted Value:

```
Pr (P=1)[probability of being non-poor] = 0.67
Pr (P=2)[probability of being absolutely poor] = 0.14
Pr (P=3)[probability of being extremely Poor] = 0.17
```

5.3.4. Determinants of Poverty Gap (Tobit Model)

A tobit model is used to model the determinants of poverty gap, i.e., factors that determine the depth of poverty. And the estimation results are given in Table 5.14. The estimated coefficients in most of the cases appear to have the same effect as the so far considered models. The chi-square statistics of the likelihood ratio shows the overall model as a good fit.

The estimation result shows that female headship as compared to male headship does not have a significant impact on the depth of poverty. Similarly, being single female head has no significant effect on the depth of the poverty of the household as compared to married FHHs. Conversely, for MHHs, being married reduces the depth of poverty for the household by about 6% relative to single male heads.

Another relevant demographic factor is age. Although age of the head remains to be insignificant, age-square reduces the poverty gap. As to the household size, the depth of poverty is positively related with the proportion of household members aged less than 15 years and over 65 years old at 1% and 10% level of significance respectively. And conversely, it is inversely related with the household members aged between 15 and 65 years old at 1% level of significance. The marginal effect shows that increasing the number of adults (age between 15 and 65), citrus paribus, will reduce the expected depth of poverty by 3%.

Except for primary education of FHHs all the education dummies are found to be significant determinants of the depth of poverty. Therefore, being an illiterate female head increases the expected value of the depth of poverty for the household relative to female head with secondary

and above level of education. The same as FHHs, relative to the male head who is illiterate, schooling of male heads contributes negatively and significantly to the depth of poverty.

The result further shows that unemployed male head, relative to the formal sector employee and self-employed male head increase the depth of the poverty gap by 7% and 6% respectively. Moreover, while informal sector employee female heads increase the poverty gap, the self–employed ones reduce it and the results are statistically significant at 5% level of significance.

Poverty gap is significantly higher for the household heads that reside in the rest of the urban areas other than Harrari, Addis Ababa and Dire Dawa.

Table 5.14. Results for Tobit Model (Modeling Poverty Gap)

P1 (Poverty Gap-dependent variable)	Coefficient	dy/dx	Std. Err.	t-vaue	P>t
SEX+	-0.02432	0.0030	0.02954	-0.82	0.41
AGE	0.01005	0.0055	0.015937	0.63	0.528
AGESQ	-0.0000	0.0000	0.0000	-2.04*	0.042
CHILD0_7	0.060193	0.0541	0.006633	9.07***	0
CHILD7_14	0.147609	0.1322	0.006478	22.79***	0
ADULT	-0.02977	0.0288	0.003711	-8.02***	0
OLD	0.03127	0.0306	0.01825	1.71*	0.087
SINGLEF+	0.021468	0.0222	0.021819	0.98	0.325
SINGLEM+	0.078481	0.0576	0.020122	3.9***	0
GR1_6F+	-0.03411	0.0178	0.026023	-1.31	0.19
GR7_11F+	-0.05633	0.0352	0.028163	-2*	0.046
GR_12F+	-0.14712	0.1037	0.039813	-3.7***	0
HIEDUF+	-0.14717	-0.1110	0.059266	-2.48*	0.013
GR1_6M+	-0.05224	-0.0709	0.020023	-2.61**	0.009
GR7_11M+	-0.07501	0.0521	0.020807	-3.6***	0
GR_12M+	-0.10377	0.1479	0.025042	-4.14***	0
HIEDUM+	-0.15998	-0.0890	0.026449	-6.05***	0
FOREMPM+	-0.04199	0.0738	0.021174	-1.98*	0.047
INFOREMPM+	0.02638	0.0679	0.019865	1.33	0.184
SELFM+	-0.04359	0.0576	0.020936	-2.08*	0.037
FOREMPF+	-0.017	0.0444	0.030465	-0.56	0.577
INFOREMPF+	0.097748	0.0877	0.030055	3.25**	0.001
SELFF+	-0.07858	0.024	0.029904	-2.63**	0.009
CITY+	-0.04334	0.037	0.01315	-3.3**	0.001
_CONS	-0.16788	---	0.032015	-5.24***	0
_ _se	0.3998	---	0.0061	(Ancillary parameter)	

(+) dy/dx is for discrete change of dummy variable from 0 to 1.

Tests are for whether the coefficient differs from zero
* Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Test Summary:

```
Number of observations = 8669
LR chi2 (24) = 1040.99
Prob > chi2 = 0.0000
Log likelihood = -4202.7614
Pseudo R2 = 0.2102
```

5.3.5. Determinants of Severity of Poverty (Tobit Model)

A tobit model is used to factor out the determinates of the severity of poverty. And the estimated result is given in Table 5.15. The chi-square statistic of the likelihood ratio shows the overall model is a good fit.

The coefficient associated with gender of the household head implies that the severity of poverty is not significantly affected by the gender of the household head. Disaggregating headship by marital status suggests that single female head have insignificant influence to affect the severity of poverty as compared to married FHHs. However, for male heads, their being married reduces the severity of poverty significantly relative to single MHHs at 1% level of significance.

As far as the age of the household is concerned, it is shown that the age square has a significant inverse influence on the severity of poverty. All the variables explaining the household composition are significant. Controlling for the effects of other variables, more number of adults reduces the severity of poverty significantly at 1%. However, the number of children in the household is positively related with poverty severity of the household and elderly people in the household at 1% and 10% level of significance respectively.

The same as the previous tobit model for the poverty gap, the association between the level of education and poverty severity is found to be statistically significant along the different schooling levels except for female heads with primary education. Relative to female heads that are illiterate the severity of poverty significantly declines as the different levels of schooling. The same holds for MHHs.

Across the employment dummies, other things being equal, relative to unemployed FHHs the severity of poverty increases for household headed by self-employed females while it increases for those headed by informal sector employed female. If we look at the severity of poverty across type of employment, all the variables are significant. Formal sector employed and also self-employed male heads, on the other hand, decrease the poverty severity to the household.

Household heads that live in Harrari, Addis Ababa and Dire Dawa negatively contribute to the severity of poverty at 5% level of significance.

Table 5.15. Results from Poverty Severity (Modeling Severity of Poverty)

P2 (Severity of poverty –dependent variable)	Coefficient	dy/dx	Std. Err.	t	P>t
SEX[+]	-0.01523	-0.0027	0.016318	-0.93	0.351
AGE	0.0042	0.0034	0.008801	0.48	0.633
AGESQ	-0.0000	-0.0000	0.0000	-1.82*	0.069
CHILD0_7	0.0330	0.05222	0.003653	9.03***	0
CHILD7_14	0.08025	0.1268	0.003561	22.54***	0
ADULT	-0.01804	-0.0307	0.002061	-8.75***	0
OLD	-0.01870	-.02970	0.0101	-1.85*	0.065
SINGLEF[+]	0.01729	0.031	0.012063	1.43	0.152
SINGLEM[+]	0.04365	0.05783	0.011099	3.93**	0
GR1_6F[+]	-0.02119	-0.0206	0.014352	-1.48	0.14
GR7_11F[+]	-0.03173	-0.0349	0.015536	-2.04*	0.041
GR_12F[+]	-0.08482	-0.1038	0.022101	-3.84***	0
HIEDUF[+]	-0.08989	-0.9073	0.033018	-2.72**	0.006
GR1_6M[+]	-0.02629	-0.0430	0.011066	-2.38*	0.018
GR7_11M[+]	-0.03902	-0.0185	0.011504	-3.39**	0.001
GR_12M[+]	-0.05412	0.0364	0.013857	-3.91***	0
HIEDUM[+]	-0.08113	-0.0721	0.014631	-5.54***	0
FOREMPM[+]	-0.02527	-0.0730	0.011704	-2.16*	0.031
INFOREMPM[+]	0.01653	0.0167	0.010979	1.51	0.132
SELFM[+]	-0.02706	-0.0253	0.011567	-2.34*	0.019
FOREMPF[+]	-0.00656	-0.0427	0.016825	-0.39	0.697
INFOREMPF[+]	0.05955	0.0481	0.016578	3.59***	0
SELFF[+]	-0.04804	-0.0020	0.016496	-2.91**	0.004
CITY[+]	-0.02358	-0.0355	0.007273	-3.24**	0.001
_CONS	-0.10472	---	0.017667	-5.93***	0
__SE	0.217	---	0.0034	(Ancillary Parameter)	

[(+)] dy/dx is for discrete change of dummy variable from 0 to 1.

Tests are for whether the coefficient differs from zero
* Significant at the 10% level; **Significant at the 5% level; ***Significant at the 1% level

Test summary:

```
Number of observations = 8669
LR chi2 (32) = 1080.34
Prob > chi2 = 0.0000
Log likelihood = −2338.8945
Pseudo R2 = 0.2876
```

Chapter Six

CONCLUSION AND POLICY IMPLICATIONS

6.1. Summary and Conclusion

The extent of poverty appears differently among the various groups of a society. In this respect, it has been argued that women experience poverty disproportionately leading to what is popularly known as, 'feminization of poverty'. However, the validity of gender and poverty has been empirically challenged.

This study has sought to assess the extent of poverty as well as vulnerability to poverty. In addition, it has identified some of the key contributory causes of poverty on FHHs in a way making comparisons with their male counterparts. Descriptive analysis, as well as poverty measurement using FGT poverty indices and multivariate analysis have been employed for the analysis of the data.

The descriptive analysis of the data set indicates that FHHs comprise 40.9% of all households in Urban Ethiopia. Seen in terms of various demographic characteristics, it is revealed that FHHs have lower average household size but almost the same dependency ratio and average age as compared to MHHs. Most of the FHHs are widowed, and divorced accounting about 75% of the FHHs as opposed to 85.3% married MHHs. In terms of education level, compared to MHHs, it is further seen that the majority of FHHs (63.4%) are illiterate. Moreover, 39% of FHHs are unemployed as opposed to 17.2% of MHHs. Most FHHs concentrate on domestic services in informal sector activities that are mostly low paying. On the other hand, the assessment of vulnerability of households to shock shows that there is no much difference between FHHs and

MHHs. About 63% for the FHHs are able to find 100 Birr in a week for unforeseen problems. The ex-post risk coping mechanisms for the majority are reserved money and loan from relatives and non-relatives. Housing characteristics in terms of both ownership and the quality of dwelling indicate that the majority of the households (both FHHs and MHHs) own their houses but most of the houses are of low quality. Considering ownership of some of the household durables such as TV sets, radio, bicycle, and motor vehicle, no difference is observed between MHHs and FHHs with very small number of people owning these durables. As to the descriptive analysis of the data set, FHHs have lower mean real per capita consumption expenditure as well as real consumption expenditure per adult equivalent than MHHs.

FGT poverty indices based on food and total poverty lines have shown that in terms of absolute poverty index about 46.8% of FHHs in urban Ethiopia are below the total poverty line while about 60.3% of them are food poor. And the poverty gap is 16.8%, indicating that 16.8% of the FHHs are far off from the absolute poverty line whereas they have 25.7% mean consumption shortfall relative to the food poverty line. Further, the severity of poverty on FHHs is 12.7% in terms of total poverty lines while it is 14% when considering food poverty line. In all cases especially in terms of food poverty, all the poverty indices are higher for FHHs than MHHs and the differences are statistically significant. Therefore, the poverty indices reveal that FHHs are poorer than MHHs. This has been further confirmed by the stochastic dominance test.

Assessing vulnerability further shows that FHHs account for 47% of the vulnerable as opposed to 39% of MHHs. The mean vulnerability to poverty shows that households headed by females are more likely (32%) to be vulnerable than MHHs (24%).

Further investigations were made on poverty and vulnerability situation by household size, marital status and education level. For both MHHs and FHHs, poverty and also vulnerability gets higher as family size increases although the differences are not significant. Besides, FHHs are poorer compared to MHHs in single, married and widowed categories whereas MHHs in separated and divorced categories are poorer than FHHs. Vulnerability to poverty is relatively higher for single and widowed FHHs. Poverty and vulnerability to poverty declines as the education level of the head increases for both MHHs and FHHs.

Although a number of specific conclusions can be drawn from the various multivariate models, the following major conclusions stand out important. First, there is strong relationship between the various demographic characteristics and the poverty status of the household. Unlike the poverty profile, all the regression results indicate that the variable indicating the gender of the household head has no significant influence to affect the poverty status of the households, implying that households headed by females are not necessarily poorer than their male counterparts. It is further indicated that family size is an important determinant of poverty. In other words, households with larger number of children (below the age of 14) and elderly people (age of 64 and above) are more likely to fall into poverty, whereas more number of adults (people in the working age group) would have the reverse effect. Marital status of the head is not found to be significant determinate for FHHs as opposed to MHHs. Single MHHs (i.e. unmarried, widowed, separated or divorced) increase the extent of poverty while the impact is insignificant for single FHHs.

Educational attainment of both MHHs and FHHs is also found to be the most important factor that is associated with poverty and welfare status of the households. Households who are illiterate

are more likely to be poor, and those households with higher level of schooling are better of than those with lower level of schooling.

Employment status of the household affects the poverty status of the households to some extent especially for FHHs. Unemployment of FHHs increases the likelihood of the household to be poor. Besides, being an employee female head in informal sector increases the poverty status of the households. On the other hand, self-employed female heads decrease the probability of being poor. And finally, residents of the city states (Harrari, Addis Ababa and Dire Dawa) are found to be better than those in the other urban areas in terms of poverty.

6.2. Policy Implication

Based on the above empirical findings, the following policy implications can be drawn. First, although the descriptive analysis of poverty indices revealed that FHHs are poorer and more vulnerable to poverty than MHHs, the regression results showed that the variable indicating gender has no significant impact on the welfare or poverty level of the households. However, other variables such as household size, education and to some extent employment level of the household head are proved to be major determinants of poverty in the region. Since FHHs are more illiterate and unemployed with most of them concentrating in informal sector activities, by implication the fact that they are female heads has an impact on the welfare or poverty status of the households through affecting their level of education and employment status. Hence, there is strong evidence to suggest that poverty alleviation programs should use FHHs as proxy variables for targeting the poor.

Secondly, the results imply that measures used to reduce dependency load at household level will help reduce poverty. And this implies that apart from the direct effect through reducing the number of children supported by an adult of working age, reducing fertility will have a beneficial impact on women's health, labour force participation, and productivity. To this end, family planning programs could play a significant role in poverty reduction in the long run.

The other key message of the analysis is that since lack of education is extremely significant in explaining the likelihood of being poor, promoting education is central in addressing problems of poverty. Investing in education has paramount significance in poverty alleviation strategies of the country. Related with this, the importance of female education in reducing poverty should be noted. Among other reasons, this might be due to the fact that female education and fertility are usually negatively correlated, hence such policy could also have an impact on household size, which is another important determinate of poverty.

And also the variable indicating region of residence suggests poverty status of the households is dependent of region of residence, hence for the government to eradicate poverty antipoverty policy should be drawn on regional basis.

In general, the study has provided evidence that certain endowments play a key role in determining poverty status of households. Thus, gender-sensitive poverty alleviation policies that enhance endowments of female-headed households such as those that increase education level, employment and ability to control fertility should be key ingredients of a poverty reduction strategy.

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Annex

Table A1. Calorie and Expenditure Shares of Different Commodities in Food Poverty Line

Food Item	Calorie share in typical diet	Level of quantity in typical diet	Contribution to value of food poverty line
Cereals unmilled	22%	140.68	12%
Cereals milled	48%	305.89	37%
Pulses unmilled	6%	38.23	4%
Pulses milled or split	5%	30.71	5%
Oil seed	1%	2.74	0%
Cereal preparations	0%	0.15	0%
Bread & other prepared food	2%	12.94	2%
Meat	0%	3.82	2%
Fish	0%	0.02	0%
Milk, Cheese & Egg	1%	27.07	3%
Oils and Fats	1%	2.41	2%
Vegetables	2%	103.76	4%
Fruits	0%	2.23	0%
Spices	2%	11.9	6%
Root crops	8%	119.72	9%
Coffee/tea	2%	26.53	11%
Sugar/salt	1%	20.68	3%
Total	100%	100%	100%

Source: Dercon, 1997

Table A2. Spatial and temporal Price Index

	Average Price Index (%)
Addis Ababa	
General	105.5
Food	105.6
Non-food	105.6
Other Urban	
General	116.7
Food	117.2
Non-food	116.1

Source: MoFED (2002b) [Extracted from Various issues of CSA Publications.]

Table A3. Calorie Based Nutrition Adult Equivalence Scales

Years of Age	Male	Female
0-1	0.33	0.33
1-2	0.46	0.46
2-3	0.54	0.54
3-5	0.62	0.62
5-7	0.74	0.70
7-10	0.84	0.72
10-12	0.88	0.78
12-14	0.96	0.84
14-16	1.06	0.86
16-18	1.14	0.86
18-30	1.04	0.8
30-60	1.00	0.82
60 plus	0.84	0.74

Source: MoFED (2002b) [calculated from The World Health Organization by Dercon,S.]