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Determinants of Vulnerability to Poverty in Female Headed Households in Rural Ethiopia

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I. INTRODUCTION

The ultimate objective of development endeavors and policies in developing countries is the eradication of poverty. Particularly today poverty in Africa is the primary development challenge facing the continent. Poverty in this continent is pervasive, intensive, chronic, gender-biased and largely a rural phenomenon. Poverty in Africa has been described as mostly a rural phenomenon not only because the majority of the population live in rural areas but also because of the distribution of economic activity between rural and urban areas (Simon, 1999).

The incidence of female headship is believed to have increased worldwide and, in both developed and developing countries, a high proportion of these households are found to suffer from poverty. Thus female-headed households have become an easily identifiable group on which to target poverty alleviation measures. However, the efficacy of such targeting has

been widely questioned (Quisumbing et al., 2009). Female headship results from a variety of causes: widowhood, divorce and de facto headship, arising, for instance, from the illness of a spouse or his migration to an urban area to find work. More work is needed to understand the relationship of forms of female headship to access to resources and the consequential effects on the ability to improve the household's position. Only when such links are documented can poverty alleviation measures be effectively and efficiently targeted (King et.al, 2000). The different roles, rights and resources that men and women have in society are an important determinant of the nature and scope of poverty. Access to income and assets, housing, transport and basic services is influenced by gender-based constraints and opportunities (Masika,et.al, 2002).

Gender empowerment is an important and appropriate instrument for enhancing gender roles in sustainable rural development. Over years the government of Ethiopia has made efforts to empower women in decision-making processes in order to facilitate the attainment of the country's sustainable development goals. The establishment of the Women's Affairs Office in the country and the formulation of a national policy on women, which entitles and ensures women's right to property, employment and pension illustrate the commitment of the government to gender empowerment (UNDP, 2012). Nevertheless, gender empowerment in the country is facing a number major constraints, including the low level of consciousness by the population about the roles played by women in the development of the country; the deep-rooted cultural beliefs and traditional practices that prevent women from fully participating in the development process of the country; lack of appropriate technology to reduce the workload of women at the household level; and the shortage of qualified female development agents to help motivate and empower rural women.

II. PURPOSE OF THE STUDY

Much of what is known about gender aspects of rural poverty is derived from micro-studies; there is a general absence of data disaggregated by sex, a prerequisite for recognition of the role of women in agriculture and the economy as a whole (World Survey, 1994). There seems to be little dispute over the fact that Female Headed Households are usually disadvantaged in terms of access to land, livestock, other assets,

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credit, education, health care and extension services. For instance, in Zimbabwe, female-headed households have 30-50% smaller landholdings than male-headed households. There are similar findings on Malawi and Namibia. In Ethiopia Female Headed Households are more illiterate and unemployed with most of them concentrating in informal sector activities, by 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 (Meron, 2009).

Moreover, in order to assess the situation of female headed households in comparison to male headed ones a static poverty assessment is not sufficient (Buvinic and Gupta, 1997). Even if female headed households are not poorer, they may be more vulnerable to poverty as they face higher risks and/or have fewer options for ex ante and ex post coping strategies. Therefore, we include the vulnerability to poverty of households as another dimension of wellbeing in our analysis. Although it is commonly stated that female headed households are more vulnerable to poverty than households headed by men in terms of shocks and downside risks, little is known about this issue empirically. There are relatively few empirical studies on vulnerability to poverty and almost none of them focus on this particular point.

Thus, study on analysis of vulnerability to poverty in female headed households in rural Ethiopia makes it instructive and important from both an academic and a practical perspective, which is the purpose of this study.

III. OBJECTIVES

1. Identify the determinants of vulnerability to poverty of Female Headed Households in rural Ethiopia, and
2. Measure the vulnerability to poverty of Female Headed Households in Rural Ethiopia

IV. MATERIALS AND METHODS

To accomplish the objective of the study a quantitative dataset from the Ethiopian Rural Household Survey is used. The Ethiopian Rural Household Survey was collected by the Department of Economics of Addis Ababa University, Oxford University and International Food Policy Research Institute. It is a rich dataset that comes in seven rounds: round one (1994a), round two (1994b), round three (1995), round four (1997), round

five (1999), round six (2004), and round seven (2009). For the purpose of this study the data set from 1999-2009 is used.

The ERHS consists of core modules that provide detailed information on household demographics, assets, and agricultural income. It also provides information on ownership of land and livestock and crop production and it includes modules that provide information on consumption, health, and women's activities. However, interpretation of results has to take into account that the data is not (and was not intended to be) nationally representative since pastoralist and urban areas are not included (Bilisuma, 2010)

The standard tools for assessing the correlates of vulnerability to poverty are multivariate consumption expenditure regressions (World Bank, 2012). These regressions can also estimate the partial correlation coefficients between consumption expenditure per adult equivalent and the included explanatory variables. An alternative to exploring the correlates of vulnerability to poverty by using per adult equivalent consumption expenditure as the endogenous variable is to perform categorical data analysis such as Probit, Logit or Tobit. Such response models are often used when a dependent variable takes one of a number of discrete values and simulations can conveniently demonstrate how much the likelihood of being poor is reduced if an exogenous variable such land ownership were to change (Bogale et al., 2005). These models estimate the probabilities of being poor using maximum likelihood estimation (MLE) while accounting for the discrete nature of the dependent variable (Greene, 2002).

The vulnerability to poverty measure proposed by Chaudhuri (2003), Chaudhuri et al. (2002), Suryahadi and Sumarto (2003) and Azam and Imai (2009) is used. Hence, there is a need to develop a method for estimating household consumption variance from cross-section data. This, however, obviously requires relatively strong assumptions about the stochastic process generating consumption. Vulnerability to poverty in this context is defined as expected poverty, or in other words as the probability that a household's consumption will lie below the predetermined poverty line in the near future. Hence, following Chaudhuri (2003) and Azam (2009), for a given household, the vulnerability to poverty is defined as the probability of its consumption being below the poverty line in the future

$$V_{ht} = pr(\ln c_{ht} < \ln z) \text{-----} (1)$$

Where V_{ht} vulnerability of household h , C_{ht} denotes the per capita consumption of household h and z stands for the poverty line (national poverty line or food

poverty line) of household consumption. The probability that a household will find itself poor depends not only on its expected (mean) consumption but also on the volatility (i.e., variance, from an inter-temporal

perspective) of its consumption stream. Therefore, both estimates (household expected consumption and the variance of its consumption) are required to quantify the

level of household's vulnerability to poverty. Assuming that for household h the data generation process for consumption is captured by the following equation:

$$\ln c_{ht} = X_{ht} \beta + \varepsilon_h \text{-----} (2)$$

Where c_{ht} stands for per capita consumption for household h, X_{ht} represents a vector of observable household characteristics as such as household size, gender of household head, educational attainment of the head of household etc, β is a vector of parameters, and ε_h is mean-zero disturbance term that captures household's idiosyncratic factors (shocks) contributing to differential level of per capita consumption for households that share the same characteristics. The vulnerability to poverty of household h with characteristics X_{ht} can now be calculated by:

$$\hat{V}_{ht} = \hat{pr}(\ln c_{ht} < \ln z | X_{ht}) = \phi \left[\frac{\ln c_{ht} - X_{ht} \beta}{\hat{\sigma}} \right] (3)$$

Where \hat{V}_{ht} denotes predicted vulnerability to poverty, that is the probability that the per capita consumption level (c_{ht}) will be lower than the poverty line (z) conditional on household characteristics X_{ht} . $X_{ht} \beta$, household's expected log consumption calculated from equation (2) Meanwhile, $\phi(\cdot)$ denotes the cumulative density of the standard normal distribution and $\hat{\sigma}$ is the standard error of the error term in (2).

Finally, the estimates of β and θ obtained through this FGLS method can be used to estimate the vulnerability to poverty of household h through the following generalization of the equation (4):

$$\hat{V}_{ht} = \phi \left[\frac{\ln c_{ht} - X_{ht} \beta}{\sqrt{X_{ht} \theta_{ij}}} \right] \text{-----} (4)$$

This is an ex ante vulnerability measure that can be estimated by cross-sectional data. Equation (3) will provide the probability of a household a becoming poor given the present distribution of consumption. A merit of this vulnerability measure is that it can be estimated by cross-sectional data. However, the measure correctly reflects a household's vulnerability only if the distribution of consumption across households, given the household characteristics at one time, represents the time-series variation of consumption of the household. Hence this measure requires a large sample in which some households experience a good period and others suffer from negative shocks.

V. RESULT AND DISCUSSION

The study focused on the conditions of vulnerability to poverty and the related determinant factors of female headed households in rural Ethiopia. The data is analyzed by both descriptive statistics and econometric analysis techniques. The descriptive methods are employed to explain the level and extent of vulnerability to poverty for female headed households among the different demographic and socio economic variables in the study area. To have deep insights whether there is feminization of poverty or not a comparative view of the status of Female Headed Households is made with that of Male Headed Households. The econometric analyses enlighten the determining factors for vulnerability to poverty of female headed households hence give empirical evidences for the basic research questions of the study.

Table 1 : Entry into poverty and exit from poverty from 1999-2009

Entry into and exit from poverty	M	F	Total
Non- poor Entry to poverty in 2004	23.20	22.92	23.06
Non-poor Entry to poverty in 2009	35.12	37.15	36.14
Poor Exit from poverty in 2004	22.66	21.35	22.01
Poor Exit from poverty in 2009	19.01	18.58	18.795

Source: Author's own computation based on ERHS 1999-2009 data

23.2% of Male Headed Households and 22.92% of Female Headed Households who were non poor in 1999 became poor in 2004. That is on average 23.06% of households entered in to poverty. During this time period 22.66% of Male Headed Households and 21.35% of Female Headed Households also exit from poverty. That is they were in poverty in 1999 and became non-poor in 2004. Though it seems that during 2004 the proportion of Female Headed Households who entered to poverty is slightly less than that of Male Headed Households, the proportion of Female Headed Households who exit poverty in 2004 is less than that of Male Headed Households. This indicates that Female Headed Households face more difficulty to move out of poverty when compared to Male Headed Households. Though the incidence of poverty is relatively lower in Female Headed Households when compared with Male Headed Households, the Female Headed Households are more vulnerable (high probability to fall in to poverty than Male Headed Households). When we compare the entry and exit or the dynamism of in to and out of poverty the number of those who are entering poverty is relatively higher than the number of those who exit poverty. This indicates that there is high vulnerable non poor (who are more probable to be poor in the near future) and poverty reduction strategies should also focus on highly vulnerable non poor.

An attempt has been made in this study to estimate vulnerability to poverty using the latest available household panel data. Using the representative panel data, vulnerability to poverty is estimated. Vulnerability to poverty computed as a probability that the household's welfare will be less than a given threshold (poverty line) next period. Using the method specified in the methodology part of this paper (equation 5) an estimate of vulnerability for each household is generated. The poverty line used in the estimation is the already described absolute total poverty line. The results summarize vulnerability to poverty (i.e., the probability that a household will be poor), and amongst the vulnerable we distinguish those whom we call the relatively low vulnerable (i.e., those who have an estimated vulnerability level less than 0.5); and those whom we call the highly vulnerable because we expect that they are more likely to experience poverty (i.e., those who have an estimated vulnerability level of greater than 0.5). A regression model of the relationship

between a household's consumption level and its characteristics is estimated. However, as some types of households may experience bigger fluctuations in their consumption levels than others, the residual error term of the regression is allowed (which considers transitory fluctuations among other things) also to vary with (a potentially different set of) household characteristics. This model is used as the basis for assessing vulnerability of households to poverty.

Following (Azami, 2009) Households with vulnerability index greater or equal to 0.5 are grouped as "high vulnerable group" (HVG) and households with vulnerability index less than 0.5 are grouped as "low vulnerable group" (LVG). Non poor households with vulnerability index greater or equal to 0.5 are grouped as high vulnerable non poor (HVNP). On average 38 percent of households out of the total sampled households are highly vulnerable to poverty (has a vulnerability index greater or equal to 0.5 or has a probability of 50 percent and above to fall in to poverty in the near future) and 16.38 percent of the non poor are highly vulnerable to poverty. But based on the recent data used for this study only 35.26 percent of households in rural Ethiopia are poor in the year 2009. This shows that expected poverty is much higher than the point-in-time estimates of poverty, which connote the importance of forward looking poverty analysis. Arguably, this indicates that point-in-time estimate poverty might be underestimated and vulnerability to poverty should be considered in targeting poverty reduction.

Moreover table 2 summarizes the mean vulnerability for different group of households. The mean vulnerability of households with vulnerability index greater or equal to 0.5 (HVG) is found to be 38% for rural Ethiopia. This means highly vulnerable households who are not currently poor have on average a probability of 38 to fall in to poverty and highly vulnerable poor households have a probability of 0.38 to remain poor. The mean vulnerability for all households is also high (0.29). This means the households have a probability of 29% to be poor or remain poor. The mean vulnerability for Female Headed Households is higher than that of Male Headed Households. This shows that Female Headed Households are more vulnerable to poverty than Male Headed Households.

Table 2 : Category of households in to relative vulnerability group

Vulnerability index	1999			2004			2009		
	M	F	Total	M	F	Total	M	F	Total
Vh ≥ 0.5	26.06	28.16	26.53	26.49	26.96	26.725	43.84	37.24	40.54
Vh < 0.5	73.94	71.84	73.47	73.5	73.04	73.27	55.92	62.76	59.34

Source: Author's own computation based on ERHS 1999-2009 data

To identify the possible determinants of the vulnerability to poverty for female headed households the vulnerability index is used in classifying female headed households as highly vulnerable and low vulnerable. When the vulnerability to poverty is greater or equal to 0.5 the household is grouped as high

vulnerable group which takes the value of 1 and 0 otherwise (when the vulnerability index is less than 0.5 for the group) as dependent variable is estimated using the same explanatory variables used to identify the determinants of poverty by the logistic estimation.

Table 3: logistic estimation for determinants of vulnerability to poverty

Probability to be poor	1999		2004		2009	
	Coefficient	T statistics	Coefficient	T statistics	Coefficient	T value
HHAGEF	0.0512467	1.46	0.007623	1.56	-0.0259597	-2.34
HHAGE2F	-0.000328	-0.82	-0.017042	-1.65*	-0.217557	-27.8***
HHSIZEF	-0.985273	-2.73 ***	0.4830301	9.14	0.0005212	0.71
HHSIZE2F	0.0446389	1.73	-0.5028173	-2.06 ***	-0.1824848	-0.58
LANDF	-0.15962	-4.28***	-0.0167	-0.75	-0.076259	-0.45
TLUF	0.2269048	2.11 ***	-0.1804487	-3.74 ***	0.1949831	2.10***
OXENF	-0.30914	-1.29	-0.4232148	-2.44 ***	0.2072659	1.13
ILITERATEFD2	0.09961	12.61***	0.023275	1.15	0.2686651	1.14
CONSTANT	3.023923	2.49	2.318365	7.61	1.001373	1.61

* Significant at the 1% level; **Significant at the 5% level; ***Significant at the 10% level

On average age square of female headed household has a negative sign and significant. This indicates that on average as the age of the female headed household increases after certain years vulnerability to poverty increases. This is as expected because as age the head increase the household acquires more skill, experience and accumulated asset that tends to decrease vulnerability to poverty. The coefficient for household size has positive sign which confirm that household size exerts more pressure on consumption than it contributes to production. This show as household size increases the vulnerability to poverty increase. But the square of household size has negative sign that shows increment of household size after a certain level negatively affects the household probability to be poor. This means current large family size can be a good labor force for the household in the future that reduces the vulnerability to poverty.

Compared to the base category illiterate head of household has high vulnerability to poverty. This is as expected because the more the household head is educated the more probable the household to use modern agricultural technologies and better cope with risk and uncertainty which reduces the probability to fall in to poverty in the future. Livestock ownership, oxen and land holding have significant effect on vulnerability to poverty reduction as the coefficient for each is negative and significant. This is in line with the expectation as asset ownership or accumulation has negative effect on vulnerability to poverty.

Livestock ownership, oxen and land holding have significant effect on reducing poverty as the coefficient for each is negative in vulnerability to poverty estimations. This is in line with the expectation that as

asset ownership or accumulation has negative effect on vulnerability to poverty. The coefficients for household heads illiteracy is positive and significant. This implies that current educational achievement of the household not only reduce current poverty status but also decrease the likelihood of vulnerable to poverty.

VI. CONCLUSION

An estimate of vulnerability to poverty shows that 38 percent of households out of the total sampled households are highly vulnerable to poverty and 16.38 percent of the non poor are highly vulnerable to poverty. The mean vulnerability for highly vulnerable female headed households is found to be 0.38 for rural Ethiopia. This reveals that on average the sampled households with high vulnerability index have the probability of 0.38 to fall in to poverty. The mean vulnerability for all households is also high (0.29). Most of the findings in the descriptive analysis are consistence with the result obtained from multivariate model. Similarly the probability of being poor is on average higher for female headed households relative to the male headed households. On the other hand, literacy of household head, livestock ownership and land holding has negative effect on poverty. In general, households with large family size and illiterate head, less livestock owned and land holding are more likely to be poor than other household heads.

Logit model for determinants for of vulnerability to poverty shows that households with large family size, illiterate head, small land holding and less livestock ownership significantly increase the probability of the Female Headed Households to be poor. It seems that

the determinants of poverty and vulnerability to poverty are similar since those variables that have significant effect on poverty also have significant effect on vulnerability to poverty.

VII. RECOMMENDATION

Variables such as household size, household head education, the household head ownership of land and oxen are proved to be major determinants of poverty and vulnerability to poverty in rural Ethiopia. Lack of education is extremely significant in explaining poverty and vulnerability to poverty since Female Headed Households headed by person having higher level education are significantly better poised to cope with risk and uncertainty. So to address the issue of illiteracy investment in human capital has paramount significance in poverty alleviation in rural Ethiopia. Particular emphasis also should be given to adult education since majority of the adults are illiterate households with larger family size, less livestock owned and land holding are more likely to be poor than other household heads. Accordingly, current government policy to increase lands and labor productivity and increasing awareness among rural women in using family planning to reduce fertility should be encouraged.

In designing policies one should take note of the varying nature of poverty and vulnerability among Female Headed Households. For the chronically poor who lack economic assets, priority should be given to reduction of consumption fluctuations and building up assets through a combination of protective and promotional programs. Access to financial services, for example, through micro credit programs, might help poor households build up assets as it could smooth income and consumption, enable the purchase of inputs and productive assets, and provide protection against crises. On the other hand, the transient poor and high vulnerable non-poor households are most likely to benefit from some combination of prevention, protection, and promotion which would give them a more secure base to diversify their activity into higher return, higher risk activities.

Therefore poverty reduction strategies should place ahead the importance of social protection and promotion programs for ensuring inclusiveness in the development process so that growth becomes more pro-poor. A sizeable portion of Female Headed Households that are now non-poor are certainly vulnerable to falling into poverty in future than Male Headed Households. This has policy implications that Female Headed Households are more vulnerable to poverty.

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