Determinants of Decision Making Power of Ethiopian Women on Large Household Purchases

Jemal Tekile1, Eshetu Wencheko2 and Mekonnen Tadesse3

Abstract

Empowerment of women is critical for the development of any country, because it enhances both the quality and quantity of human resources available for development. The objective of this study was to identify socio-economic and demographic factors/variables that are associated with or affect the economic empowerment of women in Ethiopia using data from the 2011 Ethiopian Demographic and Health Survey. The paper used women's participation in large household purchases independently or jointly with their partners as an indicator of economic empowerment. The sample data comprised 5,818 married women within the reproductive age group of 15 to 49 years. This study focused on women's economic empowerment assessed by socio-economic and demographic characteristics that included age of a woman, region, place of residence, economic status, number of living children, women's level of education, religion, employment, and husband's level of education. Data analysis was done using binary and multilevel multiple logistic regression models. The covariates; place of residence, region, number of living children, husband's level of education and economic status were found to be significant determinants of decision making about large household purchases. The random coefficient model was used to investigate whether the effects of women level covariates varied across the regions. The results revealed that there was a significant variation in economic empowerment across the regions of Ethiopia. We recommend that due attention should be given to economically empower rural women and women in low income households and efforts should be made to make women in all regions have uniform and increased economic empowerment such as involvement in decision making of large household purchases.

Key words: *Women, Decision Making, Ethiopia*

1 Department of Statistics, Addis Ababa University, Ethiopia.
2 Department of Statistics, Addis Ababa University, Ethiopia (Corresponding Author)
3 Department of Statistics, Addis Ababa University, Ethiopia.

Introduction

Empowerment of women is necessary for ensuring their own welfare, as well as the well-being of their households. It is also critical for the development of a country, because it enhances both the quality and quantity of human resources available for development. Furthermore, the success of development efforts depends on the fruits of development reaching men and women, boys and girls (World Bank, 2001). A final but fundamental reason for promoting the empowerment of women is that failing to empower women to reach their full potential is a violation of their basic human rights (Kishor and Subaiya, 2008).

Lack of access to productive resources such as land; lack of access to education, employment opportunities, basic health services, and protection of basic human rights; low participation in decision making; violence and harmful traditional practices are some of the indicators of the socioeconomic marginalization of women in Ethiopia. Gender gap between men and women in socio-economic indicators has negative impact on the overall development of the country in general and on demographic and health outcomes of individuals in particular (Ethiopian Society of Population Studies, 2008).

Women empowerment can be examined based on different indicators. Until recently, variables such as education and employment were commonly used to capture empowerment and other related concepts such as women's autonomy and status. While those proxy measures are important and are ideally associated with empowerment, they may not capture all aspects of the multidimensional concept of empowerment (Joshi, 1999).

Recently attention has turned from using indirect proxies to more direct measures to quantify autonomy. These direct measures consist of a combination of observable items or indicators that are categorized into different dimensions of autonomy, such as access to

and control over resources, participation in economic and child-related decisions, self-esteem, mobility, freedom from domestic violence, and political awareness and participation (Balk, 1994, 1997; Morgan and Niraula, 1995; Hashemi, Schuler and Riley, 1996; Jejeebhoy, 2000). The search for more direct measures has focused on capturing 'evidence' of empowerment (Kishor, 2000). One widely accepted measure of 'evidence' (or lack thereof) is women's participation in household decision-making. This variable is increasingly used as an objective indicator of women's household level empowerment, particularly in demographic and health studies (Balk, 1997).

According to UNICEF (2007), Demographic and Health Surveys suggest that men generally decide how much the household will allocate towards major expenditures. In Nigeria, for example, 78% of women indicated that their husbands have exclusive control over large purchases. Approximately 60% of women in Egypt and over a third of women in Bangladesh and Nepal felt excluded from such decisions. This contrasts with attitudes in the two countries surveyed in East Asia and the Pacific, Indonesia and the Philippines, where fewer than 18% of women in both countries felt that they had no say in such matters.

Studies about women empowerment in Ethiopia are rare. Particularly studies based on direct indicators of women empowerment such as decision making power on household matters are scarce. As a result, there is lack of comprehensive knowledge regarding different dimensions of women empowerment and factors associated with them. According to EDHS (2005) about 79% of married women who lived in urban areas participated in large household purchases independently or jointly with their partners compared to 55% of women in rural areas.

Given the above background, the current study attempts to identify socio-economic and demographic factors/variables that are associated with or affect the economic empowerment of women in

Ethiopia using data from Ethiopian Demographic and Health Survey 2011 (EDHS, 2011).

The Data and Methods of Analysis

The Data

The current study used women's participation in large household purchases independently or jointly with their partners as an indicator of economic empowerment. The sample data comprised 5,818 married women of the reproductive age group, 15 to 49 years.

Study Variables

The response variable is decision making in large household purchases (independently or jointly with husband). It is dichotomous (assumes two values). In the current paper it is coded $y_i = 1$ if the *i*th woman has a say in the purchase, and 0 otherwise.

Explanatory variables: The socioeconomic and demographic background characteristics of women involvement in large household purchases considered in this study were region, place of residence, age of women, religion, number of living children, husband's level of education, women's level of education, employment status of women and economic status. Working definitions of these socio-economic and demographic explanatory variables are provided in Table 1.

The appropriate statistical methodology used to analyze the relationship between a dichotomous variable and a set of explanatory variables/factors is logistic regression. Because the paper has two objectives we make use of two types of modelling namely, the binary multiple logistic modelling and the multilevel logistic modelling. In the subsequent parts of this section we introduce both of these.

Analytic Methods

Binary multiple logistic regression: The binary multiple logistic regression model assumes that the explanatory variables (factors

and variables), contained in a data matrix X, are related to the response through a logit transformation of the success probability, π_i as:

$$\log it(\pi_i) = \log\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0+\beta_1 x_1+\ldots+\beta_k x_k.$$

In the above model equation: π_i= the probability that a case is in the i^{th} category, is defined by

$$\pi_i=P(Y_i \mid x_{1i,\ldots,}x_{ki})=\exp(\beta_0+\beta_1 x_1+\ldots+\beta_k x_k)/(1+\exp(\beta_0+\beta_1 x_1+\ldots+\beta_k x_k))$$

where *exp* is the base of natural logarithms. The parameter β_i shows the effect of the *i*th predictor (X_i) on the log-odds that Y=1 controlling the effect of other predictors (Hosmer and Lemeshow, 2000).

Multilevel logistic regression: Since one of the objectives of the paper is to look into possible differences in the level of participation of married women depending on regions in which they live, we limit our interest to modelling to two levels. As a consequence, we have a hierarchical model structure where married women (regarded as level-one units) are nested within regions (level-two units). The following part introduces the two- level model along the lines of Snijders and Bosker (1999).

The basic data structure of two level logistic regression is a collection of N groups ("units at the level-two"), within group j (j=1,2,…,N) a random sample of n_j level-one units ('individuals'). The outcome variable is dichotomous and denoted by Y_{ij} for level-one unit i in group j. The two outcomes are coded 0 and 1. The success probability in group j is denoted by π_j. In the random coefficient model, the groups are considered as being taken from a population of groups and the success probabilities in the groups, π_j, are regarded as random variables. Suppose we have data consisting of women (level-one) grouped into regions (level-two). Let Y_{ij} be the binary response for woman i in region j. Then outcome Y_{ij} can be represented as

$$Y_{ij} = \pi_j + e_{ij}.$$

As a result the residual e_{ij} has mean zero, and $Var(e_{ij}) = \pi_j(1-\pi_j)$. Then the two-level model can be written as:

$$\log\left[\frac{\pi_{ij}}{1-\pi_{ij}}\right] = \beta_0 + \beta_1 X_{ij} + U_j$$

It is assumed that the random effect U_j has mean zero and a constant variance. Conditional on U_j, the Y_{ij} are assumed to be independent. With the aim to distinguish between level-one and level-two models the above model is often written as:

$$\log it(\pi_{ij}) = \log\left[\frac{\pi_{ij}}{1-\pi_{ij}}\right] = \beta_{0j} + \beta_1 X_{ij}$$

This is known as level-1 model; the level-2 model then becomes:

$$\beta_{0j} = \beta_o + U_j$$

Results

Descriptive Results

The following description is based on the distribution of the socio-economic and demographic factors/variables with the respective categories as presented in Table 2. Among the 5,818 married women included in this study, 58.5% reported that they alone or jointly made decision on large household purchases. Over 80% of the women in Addis Ababa reported that they were involved in decision making about large household purchases. The smallest level of involvement of married women was 39.3% for women in Benishangul-Gumuz. A higher percentage of women in urban areas (68.9%) than in rural areas (54.8%) were involved in large household purchases. The distribution of women that have participated in making decision on large household purchases was quite similar in the different age groups: 58.2%, 59% and 58.6% of women aged 15-24, 25-34 and 35-39 years, respectively were empowered and decided on large household purchases alone or together with their husbands. About 57.4% of Coptic Orthodox women made decisions in large household purchases while the percentages were 65.6 for Protestants, 56.6 for Muslims and 59.8 for others. The percentages of women that participated in large household purchases were 71.1, 57.5, 56.8 and 56.6 for women with no child, 1-2 children, 3-4 children, and 5 or more children, respectively. About 53.9% of

married women whose husbands had no education made decisions in large household purchases alone or jointly with their husbands. On the other hand, for married women, whose husbands had primary and at least secondary levels of education, the respective percentages were 62.3 and 66.1. The percentage of unemployed women that have participated in decision making of large household purchases was 57.9 whereas the percentage for employed women was 59.7. About 68% of married women with at least secondary level of education and 55.7% of married women with no education were involved in decision making of large household purchases. Close to 61% of women from low income households, 56.3% of women from middle income households, and 57.4% of women from high income households participated in decision making on large household purchases.

Results from Multiple Logistic Regression Analysis

Binary multiple logistic regression was used to identify the determinants of women's involvement in large household purchases. The statistical significance of individual regression coefficients has been tested using the Wald chi-square statistic. As can be seen in Table 3, the logistic regression analysis identified region, place of residence, number of living children, husband's level of education and economic status of a household as significant determinants of women's involvement in large household purchases. A p-value of <0.05 was considered statistically significant.

Further interpretation of the findings is based on adjusted odds-ratio (aOR) and the respective 95% confidence intervals of odds-ratio as depicted in the last three columns of the table.

The results show that married women who resided in all regions, except Gambella and Addis Ababa, were less likely (aOR<1.0) to decide on large household purchases alone or jointly with their husbands compared to married women in Dire-Dawa. Involvement in large household purchases of married women in Addis Ababa and Gambella was not significantly different from the level of involvement

of married women in Dire-Dawa. Married women in rural Ethiopia were less likely to decide on large household purchases alone or jointly with their husbands compared to those in urban areas (aOR=0.68). Married women with no child were 84.3% more likely to decide on large household purchases alone or together with their husbands compared to those women with five or more children (aOR=1.84). The odds for married women from low income households to decide on large household purchases is about 19% lower compared to married women from high income households.

Results from Multilevel Logistic Regression Analysis

In the multilevel logistic regression analysis, a two-level model structure was used with regions as level-two units and women as level-one units. The data were tested for a possible heterogeneity among regions in terms of empowerment in household purchases. The computed chi-square value $\chi 2 = 250.61$ with $p = 0.000$ provided evidence of heterogeneity among regions of Ethiopia with respect to women's involvement in large household purchases.

Three two-level models (random intercept-only model, random intercept and fixed effects model and random coefficient model) were fitted. The significant deviance-based chi-square value for the empty model in Table 4 implies that an empty model (a model having no predictors) with random effect is better than an empty model without random effect. Similarly, the deviance based chi-square test for significance of the random effects indicates that the random intercept model with fixed slope is a better fit compared to the empty model. Also the significant deviance-based chi-square value for the random coefficient model implies that the random coefficient model with random effect is a better fit compared to the empty model and random intercept model.

The Akaike Information Criterion (AIC) was used to make an overall comparison of the three models. The computed AIC values for the random coefficient model, the fixed slope model with random intercept, and the empty model with random intercept, respectively,

were 7471.95, 7610.25, and 7690.43. These figures lead to the conclusion that the random coefficient model (with the smallest calculated AIC value) provides the best fit compared to the empty model with random intercept and the random intercept fixed effect model.

Summary statistics for the random coefficient model presented in Table 5 show that the estimated variances for the intercept and economic status of women are significant, suggesting that the effects of the intercept and economic status vary significantly across the regions of Ethiopia. The negative estimate (-0.20) for the covariance between the intercept and economic status with standard error (0.146) implies that, for regions with higher than the national average proportion of women empowered to make decision about large household purchases, the effect of economic status on women's involvement in large household purchases is below the national average. Similarly, the negative estimated covariance between the intercept and place of residence (-0.13) with standard error (0.134) implies that the effect of place of residence on women's involvement in large household purchases is lower than the national average for regions with higher than the national average proportion of women empowered to decide about large household purchases.

Discussion and Conclusions

This study identified some socioeconomic and demographic variables that have significant influence on married women's involvement in large household purchases. Descriptive, multiple logistic regression and multilevel logistic regression were used for data analysis.

The descriptive results of the study indicated that 58.5 % of the women included in the study made decision about large household purchases independently or jointly with their husbands. Large percentages (80.1% and 74.6%) of women in Addis Ababa and Dire-Dawa and relatively small percentages of women in Benishangul-

Gumuz (39.3%) and Tigray (48.5%) participated in decision making about large household purchases alone or jointly with their husbands.

The binary multiple logistic regression analysis identified region, place of residence, husband's level of education, economic status and living number of children as significant determinants of decision making about large household purchases. Significant differences in women's decision making power were observed between women in rural and urban areas. Rural women were less likely to make decision on large household purchases. This finding is in agreement with the findings of a study by the Ethiopian Society of Population Studies (2008) where it was indicated that women who resided in urban areas had a better decision making power about large household purchases compared to rural women. Acharya et al. (2010) showed that rural women are less likely to be autonomous in decision making compared to their urban counterparts. The number of children living in a household was identified as a significant determinant. Women with no child had stronger decision making power than those who live with children. Women from low income households were less empowered compared to women from high income households. This finding is consistent with the finding of the Ethiopian Society of Population Studies (2008) where it was pointed out that women from high income households were found to be more empowered in making decision about large household purchases relative to women from low income households.

Multilevel logistic regression analysis was used to get a better insight into variations among regions. All the variables that were significant in the binary multiple logistic regression model were included in the multilevel models. All three multilevel models considered revealed the existence of variations about women involvement in decision making about large household purchases across the regions of the country. The analysis based on the random coefficient model which was found to be the most appropriate model showed that women empowerment status as measured by their involvement in decision making of large household purchases varied across the regions. This

means the regional random effect of economic status was found to be appropriate to explain the variations in women's involvement in large household purchases across the regions.

Based on the results of the study the following recommendations are forwarded: (a) Due attention should be given to economically empower rural women and women in low income households, and (b) efforts should be made to make women in all regions have uniform and increased economic empowerment such as involvement in decision making of large household purchases.

References

Acharya, D. R., Jacqueline S Bell, Padam Simkhada, Edwin R van Teijlingen and Pramod R Regmi. 2010. Women's autonomy in household decision-making: A demographic study in Nepal. Reprod. Health. 2010; 7: 15. Published online 2010 July 15. doi: 10.1186/1742-4755-7-15 PMCID: PMC2914657.

Balk, D. 1994. Individual and community aspects of women's status and fertility in rural Bangladesh. Population Studies, 48 (1): 21-45.

Balk, D. 1997, Defying gender norms in rural Bangladesh: A social demographic analysis. Population Studies,51:153-172.

Ethiopian Demographic and Health Survey 2011 (EDHS 2011).

Ethiopian Demographic and Health Survey 2005 (EDHS 2005).

Ethiopian Society of Population Studies, 2008, Gender inequality and women's empowerment: In-depth Analysis of the Ethiopian Demographic and Health Survey 2005. Hashemi, S.M., Schuler, S.R. and Riley, A.P., 1996, Rural Credit Programs and Women Empowerment in Bangladesh.

Hosmer, D. and Lemeshow, S. 2000. Applied Logistic Regression (Second Ed.). New York: John Wiley and Sons Inc.

Jejeebhoy, S. J. 2000. Women's autonomy in rural India: Its dimensions, determinants and the influence of context. In:

Women's empowerment and demographic processes. Harriet B. and Gita Sen Press. New York: Oxford University Press.

Joshi, S.T. 1999. Women and development - The changing scenario. New Delhi: Mittal Publications.

Kishor, S. 2000. Empowerment of women in Egypt and links to the survival and health of their infants. In: Women's empowerment and demographic processes. Harriet B. and Gita Sen Press. New York: Oxford University Press.

Kishor, S. and Lekha, S. 2008. Understanding Women's Empowerment:

A Comparative Analysis of Demographic and Health Surveys (DHS) Data. DHS Comparative Reports No. 20. Calverton, Maryland, USA: Macro International Inc.

Morgan, S.P. and Niraula, B. B. 1995. Gender inequality and fertility in two Nepali villages. Popul Dev Rev, 21: 541- 61.

Snijders, T. and Bosker, R., 1999. Multilevel Analysis: an Introduction to Basic and Advanced Multilevel Modelling. London: Sage Publications.

UNICEF. 2006. The State of the World's Children 2007.

World Bank. 2001. Engendering development: Through gender equality in rights, resources, and voice. New York: Oxford University Press.

Appendix

Table 1: Working definitions of the socio-economic and demographic factors/variables included in the study

Variables	Values/Categories
Region	1= Tigray, 2=Afar, 3= Amhara, 4= Oromiya 5= Somali, 6= Benishangul-Gumuz, 7= SNNP 8 = Gambela, 9 =Harari, 10 = Addis Ababa, 11 = Dire Dawa (*ref*)
Place of residence	0= Rural, 1= Urban (ref)
Number of living children	0 = no, 1=1-2, 2= 3-4, 3=5+ (*ref*)
Level of education of a woman	0= no education, 1= primary, 2= secondary and above (*ref*)
Religion	0= Coptic orthodox (*ref*), 1= Protestant, 2= Muslim 3 = Others
Age of women	0= 15-25, 1= 25-34, 2= 35-49 (*ref*)
Employment status of a woman	0 = not employed, 1= Employed (*ref*)
Economic status of a household	0 = low, 1 = middle, 2 = high (*ref*)
Level of education of a husband	0= no education, 1= primary, 2= secondary and above (*ref*)

NB. Those categories of the variables in column 2 above cited as (*ref*) are used as reference categories in the multiple logistic regression results given in Table 3 below.

Table 2: Number and percentage of married women aged 15-49 that had say in large household purchases alone or jointly by social and demographic characteristics

Variable		No. of women involved	%	Total no. of women
Region	Tigray	227	48.5	468
	Afar	428	58.1	737
	Amhara	434	54	804
	Oromiya	566	65.1	869
	Somali	174	55.2	315
	Benishangul-Gumuz	215	39.3	547
	SNNP	441	62.5	706
	Gambela	245	66.4	369
	Harari	180	49.2	366
	Addis Ababa	274	80.1	342
	Dire-Dawa	220	74.6	295
Place of Residence	Rural	2347	54.8	4285
	Urban	1057	68.9	1533
Age	15-24	1421	58.2	2442
	25-34	1090	59	1849
	35-49	893	58.5	1527
Religion	Coptic Orthodox	1172	57.4	2042
	Protestant	661	65.6	1008
	Muslim	1507	56.6	2661
	Others	64	59.8	107
No of Children	No	447	71.1	629
	2-Jan	1082	57.5	1883
	4-Mar	873	56.8	1537
	5+	1002	56.6	1769
Husband's level of education	No. education	1626	53.9	3014
	Primary	1248	62.3	2002
	Secondary or higher	530	66.1	802
Employment status of women	Unemployed	2272	57.9	3922
	Employed	1132	59.7	1896

Women's level of education	No	2037	55.70%	3660
	Primary	942	61.6	1529
	Secondary or higher	425	67.6	629
Economic Status	Low income	1346	60.7	2216
	Middle income	533	56.3	947
	High income	1525	57.4	2655
Total		3404	58.5	5818

Table 3: Binary multiple logistic regression model fit results

Variables/factors	B	S.E.	Wald	df	Sig.	aOR	95% CI for OR	
							Lower	Upper
Region			171.369	10	.000*			
Tigray	-1.043	.167	38.906	1	.000*	.353	.254	.489
Afar	-.604	.159	14.440	1	.000*	.547	.400	.746
Amhara	-.754	.157	23.188	1	.000*	.470	.346	.639
Oromiya	-.322	.155	4.298	1	.038*	.725	.534	.983
Somali	-.754	.179	17.822	1	.000*	.471	.332	.668
Benishangul-Gumuz	-1.339	.166	64.832	1	.000*	.262	.189	.363
SNNPR	-.439	.161	7.429	1	.006*	.645	.470	.884
Gambela	-.344	.177	3.757	1	.053	.709	.501	1.004
Harari	-.977	.174	31.466	1	.000*	.377	.268	.530
Addis Ababa	.189	.194	.941	1	.332	1.208	.825	1.768
Place of residence (rural)	-.383	.085	20.446	1	.000*	.682	.577	.805
Number of living children			48.590	3	.000*			
No child	.611	.104	34.311	1	.000*	1.843	1.502	2.261
1-2	-.086	.071	1.440	1	.230	.918	.798	1.056
3-4	-.029	.073	.164	1	.686	.971	.842	1.120
Husband's level of education			11.807	2	.003*			
No	-.148	.101	2.136	1	.144	.863	.708	1.052
Primary	.075	.098	.581	1	.446	1.077	.889	1.305
Economic status			8.131	2	.017*			
Poor	-.209	.073	8.130	1	.004*	.811	.702	.937
Middle	-.079	.080	.961	1	.327	.924	.789	1.082
Constant	1.369	.171	63.774	1	.000*	3.931		

* Significant at 0.05

Table 4: Deviance-based chi-square tests

	Random Intercept-only Model	**Random Intercept and Fixed Effect Model**	**Random coefficient model**
Deviance-based chi-square value	209.75	132.71	281
$Var(U_{oj}) = \sigma_0^2$	0.2377125	0.1703786	0.2302845
$Var(U_{2j}) = \sigma_{2j}^2$			0.0555
p-value σ_0^2	0.013132	0.01538	0.03454
p-value σ_{2j}^2			0.0094
AIC	7690.43	7610.246	7471.95

Table 5: Estimates of the random coefficient in the Multilevel Logistic regression model

Variable	Coefficient	Std. Er.	Z	P>z	95%Conf. interval	
Place of residence (rural)	-.4985502	.2007493	-2.48	0.013*	-.892011	-.105088
Husband's level of education						
No education	-.1723862	.1037186	-1.66	0.097	-.375671	.0308986
Primary	.0639531	.1000092	0.64	0.523	-.132061	.2599675
Number of living children						
No	.6673915	.106083	6.29	0.000*	.4594726	.8753104
1-2	-.0564753	.0734028	-0.77	0.442	-.200342	.0873915
3-4	-.0324106	.0742031	-0.44	0.662	-.177846	.1130249
Economic status						
Low income	-.4481346	.439385	-1.02	0.308	-1.30931	.4130442
Middle	-.1987291	.2324873	-0.85	0.393	-.654395	.2569377
_cons	.9673452	.5087514	1.90	0.057	-.029789	1.96448
Random-effects Parameters						
Region: Identity						
var(Place of residence)	.3161157	.2040352	1.5493194	0.060652	.089216	1.120081
var(economic status)	.4776879	.2501645	1.9094951	0.02809*	.1711477	1.333268
var(_cons)	.2302845	.12668	1.8178441	0.03454*	.078346	.6768813
cov(Place of residence , economic status)	.2883742	.1890355	1.5255028	0.127134	-.082128	.658877
cov(Place of residence ,_cons)	-.1340421	.1341564	-0.999148	0.31772	-.396984	.1288997
cov(economic status , cons)	-.2021342	.1465241	-1.379528	0.16774	-.489316	.0850477
Deviance-based chi-square =	281.00, d.f.=6 Prob>chi2=0.0000, Deviance =7441.95, AIC = 7471.95					