GLOBAL JOURNAL OF AGRICULTURAL SCIENCES VOL. 5, NO. 1, 2006: 33 - 38
COPYRIGHT (C) BACHUDO SCIENCE CO. LTD. PRINTED IN NIGERIA. ISSN 1596 - 2903

AN ANALYSIS OF WOMEN PARTICIPATION IN CROSS-BORDER TRADE IN NORTHERN NIGERIA

M. A. DAMISA and N. E. TIKU

(Received 10 August, 2005; Revision Accepted 17 January, 2006)

ABSTRACT

Cross-border trade has been noted as a way to foster economic integration in Nigeria and the entire African Continent due to the independence of the official economy and the nature of its ethno cultural extensions across common border. It is on this note and the fact that the role of women contribution to the economy of this nation can never be over emphasized that this study seeks to estimate the level of satisfaction derived by women participating in cross-border trade in Northern Nigeria. The Logistic Distribution Model was used to analyse the data. It was found that the level of the women satisfaction was more responsive among other factors to source of finance and level of income.

KEYWORDS: Logit, Trade, Participation, Women

INTRODUCTION

Regional trade among developing countries promotes market and product differentiation. It expands market size, provides market for domestic manufacturing and often plays a crucial role resolving food security issues. There is therefore a growing interest in improving agricultural market integration. Cross-border trade has been viewed as a way of realizing economic integration and food security not only in Nigeria but the entire African Continent. This is because of its independence of the official economy and the nature if its ethno cultural affiliations across common border (Meagher, 1993; Omobitan, 1995). Thus cross-border trade flows and government policies that influences them are vital components of economic growth and development (Haramata, 2002)

Nigerian women have been noted to be actively engaged in cross border grain trade. Women participation in trade in Nigeria has been an age long tradition. Trading has been the most important activity of women outside the home and they account for half the labour force in trade particularly in Yoruba land (Boserup, 1970; Adeyokunnu, 1980). Due to the fact that women are assumed to play second fiddle and that cross-border trade is mostly carried out informally in the country (Sa'adu, 2002), estimating the level of women contribution to national and regional economic development is quite difficult in Nigeria. Yet the role of women in the economic development of the country cannot be ignored. Women make significant contributions to food production and to the processing of foodstuffs. They provide some 60 – 80 percent of agricultural labour and are responsible for 80% of food production in the country (Ingawa, 1999). Their contribution to the national economy not withstanding, women usually have limited access to resources and opportunities; hence their productivity remains low relative to their potential.

This study therefore determines the nature and extent of women participation in cross-border trade in Northern Nigeria. In addition, the study intends to find out the factors that limits women satisfaction in the cross-border trade.

METHODOLOGY

This study was conducted in Jibiya and Illela border markets of Katsina and Sokoto States. A double stage random sampling technique was employed in drawing sample for this study. 150 women traders were randomly sampled for this study. Data were collected using structured questionnaire. The information collected include: educational status, age, household size, security, transportation, source of finance and income of the traders. The variables were measured as indicated under the model specification. The data were analysed using the dichotomous Logit regression model. The Logit model is preferred over the Linear and Probit dichotomous models because according to Green (2000),

i. The dichotomous Logit model ensures prediction of probability of choice in the rage of 0 and 1.

ii. The model unlike the Probit model is based on the cumulative distribution function thereby making it more easier to compute and interpret than the Probit model

iii.

This model is stated thus:

$$P(Y_j = 1|X_j) = \frac{1}{1+e^{(-\alpha_0 - \beta_0 X_j)}} \quad \ldots\ldots 1$$

$$P(Y_j = 0|X_j) = \frac{e^{(-\alpha_0 + \beta_0 X_j)}}{1+e^{(-\alpha_0 - \beta_0 X_j)}} \quad \ldots\ldots$$

where

α_0 and β_0 are unknown parameters to be estimated.

$$P(Y_j = 1|X_j) = F(\alpha_0 + \beta_i X_j) \quad \ldots\ldots 3$$

and

M. A. DAMISA, Department of Agricultural Economics and Rural Sociology, Faculty of Agric, Inst. for the Agricultural Research, Ahmadu Bello University Zaria
N. E. TIKU, Department of Agricultural Economics and Rural Sociology, Faculty of Agric, Inst. for the Agricultural Research, Ahmadu Bello University Zaria

$$F(x) = \frac{1}{1+e^{(-x)}} \quad \ldots\ldots 4$$

Equation (4) is the distribution function of the logistic (logit) distribution, hence the name Logit Model.
The conditional probability involved is

$$f(y/X_j, \alpha_0, \beta_j)$$

$$F(\alpha_0 + \beta_j X_j)^y \left[1 - F(\alpha_0 + \beta_j X_j)\right]^{1-y}$$

$$\begin{cases} F(\alpha_0 + \beta_j X_j) & \text{If y = 1} \\ 1 - F(\alpha_0 + \beta_j X_j) & \text{If y = 0} \end{cases}$$

$$y = \begin{cases} 1 & \text{If i-th woman is satisfied} \\ 0 & \text{If i-th woman is not satisfied} \end{cases}$$

X_{ij} = 1 - 8 are the socio-economic characteristics of the i^{th} woman defined as

X_1 = Age (years)
X_2 = level of income (₦)
X_3 = Experience (years)
X_4 = Household size.
X_5 = Educational background (years)
X_6 = Security (1 if low, 2 if average, 3 if high)
X_7 = Transportation (₦)
X_8 = Source of Finance (1 if personal savings, 2, if relations; 3, if traditional money lenders and 4, if financial institutions)

Age(X_1) refers to the number of years accrued to the woman trader from birth till date. It is expected that the older the woman have access to marketing information and technology in the region. It could also be that with age the individual has accumulated more capital which could be recycled into the business. However it may also be possible for younger individuals to participate more in marketing since they have more energy that could be spent on the hustling and bustling of the business.

The level of income (X_2) measures the wealth status of traders. It is expected that the sign of this coefficient be positive. The higher the value of X_2 variable, the greater is the level of involvement of the woman in the cross boarder trade. This is because the level of income of the trader determines to a large extent the degree of her purchasing power and her risk averse to the business.

The level of experience (X_3) refers to the number of years the woman has been engaged in trading. It can however be linked to the age of the woman such that older women in the business tend to have more experience. It is expected that women that have more experience to participate more since they are more knowledgeable about the market.

Household size (X_4) is the total number of individuals who live within and feed in the household. This comprises of the woman and her husband, children and other dependants. It is expected that women with large household will be driven by the desire to alleviate the economic crunch in the family to participate fully in the trade

Educational (X_5) background is a variable that measures the level of knowledge acquisition of the trader through any organised means which could either be formal or informal. This could either be positively or negatively related to the level of the woman participation in cross-border trade. It is possible for women who have acquired more education to seek for white collar jobs that are thought to pay better than trading. It is also possible for women who have acquired more education to have a better understanding of the trade and therefore be more involved in the business.

Security (X_6) refers to the level of exposure of the women to the hazards associated with the job. Such job hazards include the rate of accidents and armed robbery on the way. It is expected that high level of insecurity will force many of the women out of the business. It is however measured as a dummy variable that captures the woman's view on the issue.

Transportation (X_7) variable captures the amount of money spent by the woman from the point of goods purchase (which could either be from the farm gate or local market) to the border market. It is expected that the higher the transportation cost, the more the women will be discouraged from the business.

Source of finance (X_8) variable captures where the women source for their income for trade. It is expected that the more difficulty the women experience in sourcing for funds, the more limited will there trade be.

The marginal probabilities of factors determining women satisfaction in cross-border trade were derived from the Logit model as:

$$\frac{dP(Y_j = 1|X_j)}{dX_j} = \beta_j F'(\alpha_0 + \beta_j X_j) \quad \ldots\ldots$$

where

F' = the derivative of the Logit distribution function (iv)

The elasticity of probability of women satisfaction in cross border trade was estimated in order to determine the responsiveness of the probability with respect to j^{th} factor and this elasticity of probability of women satisfaction is defined as percentage change in probability to percentage change in the magnitude of factors influencing women satisfaction in cross border trade. It is the marginal effect of X_j on $P(Y_j = 1|X_j)$ such that the elasticity of probability is given by

$$\frac{dP(Y_j = 1|X_j)}{dX_j} = \beta_j F'(\alpha_0 + \beta_j X_j)(1 - F(\alpha_0 + \beta_j X_j)) \quad \text{.....(vi)}$$

Where

F' = Estimated probability of women satisfaction in cross-border trade.

β_j = Estimate of the Logit regression coefficient with respect to j^{th} factor

RESULTS AND DISCUSSIONS

The women cross-border traders in the study area were found to be mostly engaged in various forms of agricultural commodity marketing (Table 1).

Table 1: Distribution of Respondents by Type of commodities they Trade

Commodities Traded	Frequency	Percentage
Food Crops	72	48
Poultry/ Livestock	35	23
Vegetables and Fruits	16	11
Fisheries	21	14
Others	6	4
Total	150	100

Source: Field survey 2005

The main commodity being traded is food crop. This might not be unconnected with the high demand for the food crops. This demand has increased with the food crises in the neighbouring Republic of Niger. This according to the traders means 'good business which leads to good profit'. In fact personal interviews with the traders reveal that seasonal price fluctuations for food crops increase profit margins for traders who store crops immediately after harvest and sell them later in the year. For example, in Jibia, the price of grains traded across the border increases on the average more than three times from February to September. Most of the fish being traded in the border areas are smoked fish. Other commodities being traded in the region include 'daddawa' (local spice made of locust bean seed) and dyed cloth. Women dominate the cloth-dyeing business in the study area.

Apart from the type of commodity traded, the cross-boarder women traders could also be categorised according to the size of the goods they trade in. They could hence be grouped into three categories – retailers, retailers/ wholesalers and wholesalers. Field survey (Table 2) indicated that 51% of the women cross border traders were retailers. This group of retailers do not travel. They reside in the border area where they participate in the trading activities. Some of the retailers own the businesses while others work on commission. There are retailers who act as wholesalers. These are the women who deal basically on agricultural commodities. They travel to rural markets to purchase commodities in bulk and they constitute 31% of the women traders. They claim that buying in bulk help to expand their businesses. 18% of the women traders are wholesalers. The only difference between the wholesalers and wholesaler/ retailers is in volume of goods purchased.

Table 2: Distribution of Traders by size of Trade

Type of Trade	Frequency	Percentage
Wholesale	27	18
Wholesale/ Retail	47	31
Retail	76	51

Source: Field survey, 2005

The satisfaction derived by women from cross-border trade can be determined in terms of their effectiveness and efficiency of their trade performance. Constraints such as income, family size and transportation can make women to be dissatisfied with their involvement in trading (i.e reduce their marketing performance). Table 3 shows that 69% of the women sampled are dissatisfied with cross-border trade. The improvement in women involvement in cross-border trade requires therefore, examining the socio-economic constraints that affect their satisfaction in participating in cross-border trade.

Table 3: Women Satisfaction in Cross-Border Trade

Level of Satisfaction	Frequency	Percentage
Very low	45	30
Low	58	39
Moderate	41	27
High	6	4
Very high	0	0
Total	150	100

Source: Survey data 2005

The likelihood ratio index indicated that up to hundred percent (100%) of the total variation in the dependent variable was explained by the Logit model (Table 4). The -2 log likelihood test was 0.0001; Cox and Snell R Square, 0.74 and Nagelkerke R Square, 1.00 indicating the goodness of fit of the model. 100% of the women cross-border traders were correctly classified by the model. The model chi square was 67.3% and significant at the 5% level.

Table 4: Summary of Statistics of the Logit Model Analysis

Number of women traders predicted	100%
Model Chi Square	67.301
- 2 Log Likelihood	0.0001
Cox and Snell R Square	0.740
Nagelkerke R Square	1.000

The study observed that transportation, source of finance, income and security are positively and significantly related to women satisfaction in cross-border trade at 5% (Table 5). Women use mostly public transportation to transfer their goods across the borders to local and regional markets. The women however, gave series of complains of the inefficiency of the transport system. Due this inefficiency, the women traders face frequent delays in produce delivery thereby causing perishable consumable items to loose value. In overcoming this problem, women grain traders organise themselves into groups and negotiate the easy passage of their goods using freight forwarders. As Table (5) indicated, the odds ratio associated with transportation is 8.398. It

Table 5: Maximum Likelihood Estimates for the Factors determining Women Satisfaction in Cross-Border trade in Northern Nigeria

Factors	**Coefficients**	**Exp (β)**
Age (X_1)	-3.346 (1.956)	0.035
level of income (X_2)	2.983 (1.003)	19.789*
Experience (X_3)	-3.503 (1.801)	0.030
Security(X_4)	1.815 (0.236)	6.167*
Educational level (X_5)	-13.127 (8.518)	0
Household size (X_6)	0.152 (0.092)	1.169
Transportation (X_7)	2.127 (0.688)	8.398*
Source of Finance (X_8)	-6.020 (2.123)	0.003*
Constant	-2.296 (1.754)	0.101

Figures in parenthesis are the standard errors
*Significant at the 5% level

therefore implies that if the transportation system should be improved by a unit increase of its variable a unit of X_7), then the odds that the women traders becoming more satisfied in the cross-border trade (i.e Y=1) increases more than eight fold *ceteris paribus*. This therefore means that the probability of the women traders being satisfied with cross-border trade changes to 0.89 as a result of the transport improvement. If the transport variable further increases by two units, then the probability of the women satisfaction changes to 0.99. A probability of 0.99 is quite a large response.

Most of the women traders complain that the profit they make is only barely enough to take care of their family obligations. Very little is always left behind which cannot help them to expand their business. In times of need, the women traders turn to their only source: relatives and traditional financial lenders. These sources only provide a small amount of credit with very often short term payment requirements. There is an inverse relationship between the traders' satisfaction and the source of finance coefficient. This is because most of the traders do not access to modern financial institutions. Their most ready sources are money lenders who normally charge large interest rates that the women do find healthy to their businesses. A few however source income from relations and very few others from cooperatives. The odds ratio associated with income level is 19.789. This brings about a probability change of 0.95 in the level of satisfaction of the women in their trade with just a unit important of the variable.

The women traders complained of increased incidents of physical assaults and robberies while en route to markets. Women traders therefore travel in groups to ensure their security while others have stopped travelling to some specific markets they consider as 'security risk zones'

The marginal probabilities of the significant factors influencing women satisfaction in cross border trade were also estimated at three levels of the significant factors based on equation (1) and the result is presented in Table 6.

Table 6: Predicted probability of the Socio-Economic Factors Affecting Women Participation in Cross-border Trade in Northern Nigeria

Factor	Minimum	Average	Maximum	Average Marginal Probability	Average Elasticity of Probability
X_2	1	2.96	6	0.472	1.739
X_4	1	1.66	3	0.287	0.593
X_7	1	3.98	5	0.337	1.667
X_8	1	3.14	5	0.952	3.724
Probability	0.71	0.80	0.98	NA	NA

NA=Not Applicable

The marginal estimates were done to view the extent of influence of the significant factors on women participation in cross-border trading. The women satisfaction was more responsive to source of finance, followed by level of income, transportation and least by security. It is pertinent to note here that even though the women are more responsive to the sources of finance (X_8) , the odds ratio associated with sources of finance is just 0.003. In other words the probability that a unit change in X_8 will bring about satisfaction in the women trade is a mare 0.003 *ceteris paribus*. This is however quite low. The explanation of this is improvement in the source of finance variable without improving on the other significant factors will not improve the satisfaction of the women in their trade. It is either they will not be able to pay back the loan or the loan itself will be diverted to meet other obligations. Whatever help that will be rendered to the women should be one that will improve upon their level of income. That is only when the satisfaction of the women in their occupation will be improved.

CONCLUSION

The women response to their significant factors is quite elastic: meaning that a small improvement in the significant factors could bring a wide improvement in the job satisfaction of the women. This will enhance the marketing efficiency of their product. The level of income and source of finance were a major constraint to the cross-border women traders; in view of the economic significance and political importance of their activity, agricultural credit institutions could grant loans to these women at low interest rates *ceteris paribus*. This act could have a multiplier effect on the general improvement of agriculture in the country.

REFERENCES

Adeyokunnu, T. O., 1980. Women and Agriculture in Nigeria. Study commissioned by the Trading Research centre for women. Addis Ababa.

Boserup, E., 1970. Women's Role in Economic Development Publisher. Earthscan Publications Limited, London.

Green, W. H., 2000. *Econometric Analysis*. 4th Edition. International Edition. Parentice Hall International Inc.

Haramata, C., 2002. A Globalising World. Bulletin of the Dry Land People, Policies and Programme. 41: 3-6.

Ingawa, S. A., 1999. Welcome Address at the National Workshop for Women in Agriculture held in FACU, Sheda-Abuja, Nigeria. 31st August-2nd September

Meagher, K., 1993. Informal Integration or Economic Subversion? The Development and Structure of Parallel Trade in Sub-Saharan Africa. A Paper Presented for the IDRC/ ECOWAS.International Conference on West African Integration.

Omobitan, O. A., 1995. Cross-Border Trade between Nigeria and its Neighbours (Nigeria-Benin Cross-Border Trade). A Paper Presented for the Regional Workshop on the Monitoring of Trade between Nigeria and the Neighbouring Countries, Cotonou, Benin.

Sa'adu, B., 2002. Determinants of Cross-Border Trade. Regional Bulletin of Cross-Border Trade Monitoring. Cotonou, Benin. July – September.