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EFFECT OF MICROFINANCE BANKS LOAN ACCESSIBILITY ON WOMEN CASSAVA PROCESSOR'S WELFARE STATUS IN SOUTHWEST NIGERIA: AN ENDOGENOUS SWITCHING REGRESSION APPROACH

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ABSTRACT

The study estimates the effect of microfinance credit loan on women cassava processor's welfare in southwest Nigeria. An endogenous switching regression model was adopted to control for a possible selection bias due to unobserved factors. Multistage sampling was used to select 200 respondents and semi-structured questionnaire augmented with scheduled interview was used to retrieve information. It was found that access to credit (especially microfinance loans) was generally low. Welfare status was also low across the respondents as the majority of the processors (95%) are in the lower boundary welfare status. The endogenous switching regression results confirmed the presence of both a positive and negative selection bias. In general, the results showed that microfinance loan significantly (p<0.05) affects the outcome of both groups. Households who are beneficiaries would have had a drop in welfare of about 10.3% less if they had not opted for the microfinance loan i.e. ATT. Similarly, households who are non-beneficiaries would have earned about 33.1% in welfare increase if they had opted for micro loans, i.e. ATU. This welfare increase gained due to participation in micro loans and the potential benefits indicates that getting a microfinance loan has a strong positive and significant effect on welfare. As a result, it is recommended that government agencies and financial institutions should collaborate with pertinent stakeholders to create policies that reduce barriers to accessing microfinance loans for cassava processing women. This could include lowered interest rate, provision of securities and guarantees, and simplification of loan applications and assessment.

Keywords: Accessibility, Cassava, Microfinance, Welfare and Women

INTRODUCTION

Cassava is a versatile crop; all parts of the plant including its root can be process into some products. These include food for human consumption, animal feeds and industrial based products, making cassava-based diets sources of dietary energy (Olowoyeye et al., 2018). Nigeria is the largest producer of cassava roots in the world with an estimated 36.8 million metric ton (MT), mostly produced by smallholder farmers on fragmented land holdings of about 1-5 ha per farmer, and at an average yield of 12 MT/ha (FAOSTAT, 2022). Notwithstanding the leading role of Nigeria in global cassava production, the country can still leverage on some enabling factors for better production and improved welfare of the smallholder producers and other actors along the cassava value chain, especially through value addition. Timely access to sufficient credit has been adjudged as one of the critical factors needed for the success of producers and other actors along agricultural value chains in Africa. Although access to credit is critical to agricultural production and welfare, farming households in Nigeria are usually confronted with poor credit access. The trend in agricultural access to credit reveals that between 1991 and 2006, the agricultural sector obtained annual average credit up to the tune of \$US500 million, which rose above \$US1 billion in 2007. Although there was a rise in credit availability between 2010 and 2014, there has been decline since then. When agricultural credit obtained was viewed as a share of total domestic credit available to all sectors in the economy, the agricultural sector was seen to be lacking. Although

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Women's participation in agri-business has attracted significant attention from policymakers, researchers, NGOs, politicians, the government sector, and international agencies. This is because it has been identified that women's involvement in income generation tends to boost family income, support children's education, improve health of family members, provide food, build assets for the family, and contribute to general development of economies (Shang, 2022). However, women have not been performing these roles because of constraints placed consciously or inadvertently on them by society, limiting them from engaging in income-earning ventures, especially in developing countries such as Nigeria. Even those who wish to venture into economic activities face both economic and non-economic challenges that limit their enterprises. The fact that women feel the scourge of poverty more than their male counterparts in developing countries cannot be overemphasized (Asongu and Le Roux, 2019). This is evident in the types of work they do, as most of them are peasant farmers and petty traders with little or no capital to expand their businesses (Adeaga et al., 2020). Furthermore, most of the attempts made by them to be empowered, to escape poverty and improve their welfare, have been met indirectly with either cultural restrictions that prevent women from owning properties, so as not to be independent of their husbands, or institutional restrictions that spell out strict conditions, such as collateral, as a condition for accessing loans. Despite these restrictions, women all over the world are becoming conscious of the fact that poverty has been feminized, that it is possible for women to be financially empowered, and that they can compete favourably with their male counterparts. Scholars at both the International and National levels have researched the activities of commercial banks towards empowering rural women. While commercial bank services provided women with start-up and working capital, and that savings led to women engaging in income-generating activities that empowered them and changed their role in society. They have been unable to cover cassava processing demography due the nature of business, rigidity in documentation and collateral requirement which poses a major challenge to women in agriculture as they find it difficult to meet these heavy requirements. Hence, its contribution to poverty reduction, especially among women in agriculture, has been questioned. Microfinance bank loans as a close alternative has been a major source of credit to women in agriculture based on exploratory research. It is therefore necessary to determine the impact of microfinance bank loans on the welfare status of cassava processing women in Southwest Nigeria which is the justification behind this study.

MATERIALS AND METHODS

The Study Area

The study was carried out in Southwest, Nigeria. The region lies between latitudes 4 and 9N and longitudes 30 and 7E with a total land area of 77,818 km² and a total population of 40,803,568 (NBS, 2020). The region comprises six states: Ekiti, Lagos, Ogun, Ondo, Osun and Oyo. Several occupations, including farming, trading, government salaried positions, and the unorganized sector, are practiced by the locals.

Method of Data Collection

The data was collected from the respondents through the use of a well-structured research questionnaire, complemented with an interviewschedule to elicit the necessary information from the selected respondents.



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Sampling Procedure and Sample Size

A multistage sampling procedure was used for this study. Ondo and Oyo State were purposively selected due to the prominence of cassava processors and microfinance lending. Oyo and Ondo States are made up of four Agricultural Development Programme (ADP) zones each. The second stage therefore involves a random selection of five (5) communities in each ADP zone making a total of 40 communities. The last stage involves random selection of five (5) cassava women processors in each communities making a total of two hundred (200) cassava processing women respondents used for the study.

Analytical Technique

Welfare Index

This study employed the Household Welfare Index (HWI) to examine the welfare status of cassava processing women both beneficiaries and non-beneficiaries of microfinance bank loans. According to Kumar (2018), HWI is a composite statistic of per capita consumption expenditure, per capita expenditure on education, per capita expenditure on accommodation or housing, and per capita expenditure on health or medical treatment indicators. These indicators are used to rank households' welfare. As this index is constructed with five indicators, five distinct indices are constructed to calculate HWI which are as follows:

$$Consumption \, Index \, (CI) = \frac{1}{n} \sum_{i=l}^{n} \frac{\ln(EC_i) - \ln(EC_l)}{\ln(EC_h) - \ln(EC_l)} \qquad \dots (1)$$

$$Education \, Index \, (EI) = \frac{1}{n} \sum_{i=l}^{n} \frac{\ln(EE_i) - \ln(EE_l)}{\ln(EE_i) - \ln(EE_l)} \qquad \dots (2)$$

$$Eaucation Index (EI) = \frac{1}{n} \sum_{i=1}^{n} \frac{\ln(EE_h) - \ln(EE_l)}{\ln(EE_h) - \ln(EE_l)} \qquad \dots (2)$$

$$Health Index (HI) = \frac{1}{n} \sum_{i=l}^{n} \frac{\operatorname{m}(EH_{i}) - \operatorname{m}(EH_{l})}{\operatorname{ln}(EH_{h}) - \operatorname{ln}(EH_{l})} \qquad \dots (3)$$

$$Accomposition Index (AI) = -\frac{1}{n} \sum_{i=l}^{n} \frac{\operatorname{ln}(EA_{i}) - \operatorname{ln}(EA_{l})}{\operatorname{ln}(EA_{i}) - \operatorname{ln}(EA_{l})} \qquad \dots (4)$$

$$Accomposition Index (AI) = \frac{1}{n} \sum_{i=l}^{n} \frac{\ln(EI_i) - \ln(EA_l)}{\ln(EI_l)} \qquad \dots (4)$$

Investment Index (II) =
$$\frac{1}{n} \sum_{i=1}^{n} \frac{\operatorname{m}(EI_{i}) - \operatorname{m}(EI_{l})}{\operatorname{ln}(EI_{h}) - \operatorname{ln}(EI_{l})}$$
 ...(5)

Where,

EC = expenditure on consumption; EE = expenditure on education; EH = expenditure on health; EA = expenditure on accommodation; EI = expenditure on investment; i = individual household; h = highest value; l = lowest value; n = total number of households.

Finally, HWI was formulated with the geometric mean of the above five normalised indices stated in equations 1 to 5 as follows:

$$HWI = \sqrt[5]{CI.EI.HI.AI.II}$$

...(6)

A household scores higher HWI when all the indicators are higher. The value of HWI ranges from 0 to 1. The ancestor of the index classifies households into one of two categories according to the value of HWI such as: 'lower level of household welfare' for HWI scores between 0 and 0.5, and 'higher level of household welfare' for scores between 0.51 and 1.0.

The Endogenous Switching Regression Model

The Endogenous Switching Regression Model was used to determine the factors influencing the accessibility of microfinance bank loans to cassava processing women in the study area. In the ESR model framework, a two-stage estimation procedure was estimated simultaneously. The first stage involves estimating the selection to determine the factors influencing the accessibility of microfinance bank loans using the probit regression model as shown in the equation below;

$$Pi (Y = 1) = (Fx_i)$$

$$Where: Y = \beta_0 + \beta i Xi + \mu_i$$

$$\dots(7)$$

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ISSN (Print): 2651-6144; ISSN (Online): 2651-6365 Website: http://www.jasd.daee.atbu.edu.ng where, Yi = Response to the accessibility of microfinance bank loans (Dichotomous variable 1 = yes; 0 = no); βi = vector of unknown coefficients; Xi = Independent variables. In the second stage, the factors influencing the accessibility of microfinance bank loans to cassava

In the second stage, the factors influencing the accessibility of microfinance bank loans to cassava processing women variables are specified for two regimes of beneficiaries and non-beneficiaries as; Regime 1 (beneficiaries); $Y_{hA} = Z'_{hA} \beta + \mu_{hA}$ if $P_h = 1$, ...(8)

Regime 1 (conclusion); $T_{hA} = Z_{hA} \beta + \mu_{hA}$ if $T_{h} = 1$, ...(0) Regime 0 (non-beneficiaries); $Y_{hN} = Z'_{hN} \beta + \mu_{hN}$ if $P_h = 1$, ...(9) Where: V_{hA} and V_{hA} are the outcome variables for beneficiaries and non-beneficiaries respectively.

Where; Y_{hA} and Y_{hN} are the outcome variables for beneficiaries and non-beneficiaries respectively; Z is a vector of Households' endowments and business performance characteristics; β is a vector of parameters to be estimated; μ is the error term.

The expected values of the outcome Y on beneficiaries and non-beneficiaries of good post-harvest practices can be expressed as in Equations (8) and (9):

Regime 1 (beneficiaries): $E(Y_{hA} | P=1) = Z' X_{hA} - \sigma_{A\epsilon} \lambda_A$...(10)

Regime 0 (non-beneficiaries): $E(Y_{hN} | P=1) = Z' X_{hN} - \sigma_{N\varepsilon} \lambda_N$

A change in the outcome due to accessibility of microfinance bank loans termed the average treatment effect on the treated (ATT), is expressed in Eq. (12) below as the difference in the expected outcomes (Olaniran *et al.*, 2021):

(11)

...(13)

ATT =
$$E(Y_{hA} / P = 1) - E(Y_{hN} / P = 1)$$
 ...(12)

$$Z(\beta_{hA} - \beta_{hN}) + \lambda_A(\sigma_{A\epsilon} - \sigma_{N\epsilon})$$

Where: $E(Y_{hA} \text{ and } Y_{hN})$ are expected outcome variables for beneficiaries and non-beneficiaries of accessibility of microfinance bank loans respectively; X_i is a vector of Households' endowments and business performance; Z is a vector of parameters to be estimated;

 λ is the inverse mills ratios; σ is the covariance of the error terms.

Thus, the independent (explanatory) variables that will be used for probit and ESR model are specified below; $X_1 = Age$ (in years); $X_2 = Sex$ (Male= 1, Otherwise= 0); $X_3 =$ Household size (No.); $X_4 =$ Business experience (years); $X_5 =$ Marital status (Married = 1, Otherwise= 0); $X_6 =$ Membership of association (Yes =1, No =0); $X_{7=}$ Profitability of the business (NGN); $X_8 =$ Education level (in years); $X_9 =$ Cost of raw materials (NGN); $X_{10} =$ Cost of processing raw materials (NGN); $X_{11} =$ Interest Rate on microfinance loans (Beneficiaries only); $X_{12} =$ Access to market; $X_{13} =$ Technological adoption; $X_{14} =$ Labour availability

RESULTS AND DISCUSSION

Socio/Demographic Characteristics of the Farmers

Tables 1 shows the demographic characteristics of beneficiaries, non-beneficiaries and the pooled sample. The indicators measured comprise of age, gender, marital status, the household size, and the level of education, experience, extension visits and nature of the processing work.

The results revealed that the mean age of the sampled beneficiaries was 47 years while those of the non-beneficiaries is 49 years. The modal age range was found to be 41-60 years for both the beneficiaries and non-beneficiaries. The minimum and maximum age for both groups was also observed to be 25 and 75 years respectively. Also, the result of the inferential statistics (t-stat = 1.60) shows that there is no noteworthy difference between the ages of the two groups of processors. Meaning that it cannot be conclusively said that the non-beneficiaries are older than the beneficiaries. Age has been conjectured to assume a quadratic function in agricultural activities. In summary, without making any definitive assertions, it is clear that based on the age distribution obtained in this study, it can be inferred that the cassava processing population in the study area is economically active and agriculturally viable. This result validates the findings of



ISSN (Print): 2651-6144; ISSN (Online): 2651-6365 Website: http://www.jasd.daee.atbu.edu.ng Ogunyinka and Oguntuase, (2020). The distribution of the respondents by sex revealed that all the cassava processors in the study area were females. Generally, the low/no involvement of men in the cassava processing enterprise suggests that it is probably a gender specific business which may also be labour intensive. This aligns with the purposive selection of gender group as women are more generally involved in cassava processing. This result corroborates the findings of Odekina *et al.* (2024) who reported more female involvement in cassava processing. However, other factors may contribute to this female sole involvement in this enterprise.

The distribution of the respondents by household size showed that an ample amount, (52.3%) of the respondents have household sizes ranging between 6-10 persons while about 47.7% of the respondents have less than 5 family members. The mean household size of both the microfinance loan beneficiaries and non-beneficiaries were also found to be 5 and 6 members respectively.

The mean difference between these two groups was statistically significant at 5% level of significance implying a noteworthy difference between their household sizes. Families with larger household sizes are likely to easily meet their labour needs. It has also been opined that a larger household size can in many cases warrant a hunt for more finance so as to meet the need of the home.

Results in Table 1 also showed that overwhelming majority of the processors, i.e, 85% of the respondents were married, 4% single, widowed and divorced while just 3% occupy the separated group. Marital status as a household indicator is used to determine stability as it is normally believed that married household heads tend to be more stable in their agricultural ventures and opened to favourable changes than the unmarried ones (Oppong-Yeboah, 2015). Furthermore, this depicts there is the availability of family labour for their processing activities. This result agrees with the findings of Obisesan, (2014) who reported that marital status plays an important role in agricultural development.

Results in Table 1 showed the result of the educational status of the respondents. Findings of this study shows that, majority (61.9%) of the respondents have post-primary education of about 6-12 years. This suggests that most of the farmers/processors are literate enough to make informed decisions to use or dis-use an innovation/technology/aid/grants/loan. This aligns with the study of Odekina *et al.* (2024), who posited that education facilitates participations in interventions.

Furthermore, Table 1 shows the results of years of experience of cassava processors. The average experience recorded from pooled data is 15 years with a minimum of 3 years and a maximum of 33 years. About 45.3% of the beneficiaries and 29.9% of the non-beneficiaries have an experience of less than 10 years. Also, 43.3% and 43.7% of the beneficiaries and non-beneficiaries respectively fell within the experience range of 11-20 years. A wide standard deviation of 6.74 and 7.69 for both the beneficiaries and the non-beneficiaries respectively suggests that there is a wide disparity between the years of experience of the respondents. The mean years of experience in the study area among cassava processors was approximately 13 years and 16 years for the beneficiaries and non-beneficiaries respectively. The inferential test on mean difference shows there is a difference between the two groups of processors.

The results of membership of association as reported in Table 1 also revealed that about 71.6% of the sampled respondents do not belong to an association while 28.4% belongs. It was observed that the majority (about 66.0%) of the beneficiaries belonged to an association which is considerably higher when compared to their non-beneficiary counterparts where by only 14.6% are members. Some of the advantages of belonging to a social group is that there is availability of

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information for informed and better decision making as well as ideas and other form of social capitals. Agricultural cooperatives for instance provide benefits to members at a minimal or no cost. They also pool their resources in achieving great feats. Farmers/processors are able to learn and gain experiences from each other as it pertains to the use of a new innovation in a social system **Table 1: Distribution of respondents by Demographic Characteristics**

Characteristics	Pooled (n = 197)	Beneficiaries(n ₁ = 53)	Non-beneficiaries (n ₂ = 144)
Age (years)			
21-40	46(23.4)	18(34.0)	28(19.4)
41-50	140(71.1)	30(36.6)	110(76.4)
>60	11(5.6)	5(9.4)	6(4.2)
Mean	48.6	46.9	49.3
Standard deviation	10.24	11.90	10.18
(t-stat = 1.604)			
Marital Status			
Single	8(4.06)	7(13.2)	1(0.7)
Married	167(84.8)	42(79.2)	125(86.8)
Widowed	8(4.06)	2(3.8)	6 (4.2)
Divorced	8(4.06)	1(1.9)	7(4.9)
Separated	6(3.05)	1(1.9)	5(3.5)
Household size			
<5	94(47.7)	32(60.4)	62(43.1)
6-10	103(52.3)	21(39.6)	82(56.9)
Mean	5.6	5.3	5.7
Standard deviation	1.4	1.4	1.3
(t-stat = 2.06**)			
Years of schooling			
<6	43(21.8)	8(15.1)	35(24.3)
7-12	122(61.9)	32(60.4)	90(62.5)
>12	32(16.2)	13(24.5)	19(13.2)
Mean	10.9	11.7	10.5
Standard deviation	3.6	3.7	3.5
(t-stat = 2.28**)			
Cassava processing experience			
(Years)	67(34.0)	24(45.3)	43(29.9)
<10	86(43.7)	23(43.4)	63(43.7)
11 - 20	44(22.3)	6(11.3)	38(26.4)
>30	15.4	13	16.3
Mean	7.42	6.74	7.69
Standard deviation			
(t-stat = 3.08)			
Membership of association	56(28.4)	35(66.03)	21(14.6)
Yes	141(71.6)	18(33.7)	123(85.4)
No			· · · ·
Extension contacts per year	95(48.2)	9(17.0)	86(59.7)
Yes	87(44.2)	44(83.0)	43(27.8)
No	× /	. /	

Figures in parentheses are percentages;

Source: Field survey, 202

Finally, the results in Table 1 also showcased the frequency of extension contact. Extension contact has been found to be a key aspect in innovation/technology usage (Akudugu *et al.*, 2012). The knowledge that an innovation/aid/loan exists as well as the know-how in its usage and benefits are what is usually brought to bear by the extension agents. Extension education also attempts to



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simplify complexities associated with the usage of new technology or an intervention. Majority of the beneficiaries had no extension visit in the last one year while it is the other way round for their non-beneficiary counterpart who reported at least an extension visit in the last one year.

Welfare status of cassava processors

This section is on the Mean expenditure on household basics by beneficiaries and nonbeneficiaries and the overall welfare status of cassava processors in the study area.

Table 2 shows the Mean per capita expenditure on household basics by beneficiaries and non-beneficiaries. Per capital expenditure is derived by dividing the household expenditure by the household size of the respondents. Total monthly expenditure for the beneficiaries was calculated to be 39,468.33 while those of the non-beneficiaries as 28,597.7. A t-stat value indicating a 10% level of significance indicates that there is a significant difference between the total monthly expenditure of the two groups. This means that beneficiaries of microfinance loan spent more than their non-beneficiaries from their enterprise haven gotten enough capital to scale up their business. The table also show that households of the spent N1,104.4, N795 and N880 more on education non-food and investment respectively than their non-beneficiary household expends N6996, N785 and N311 on food, health and accommodation respectively. The t-stat estimates of these variables indicates that there is a significant difference between the two groups. As expected, more is expended on food by the two groups.

Beneficiaries (N)	Non-beneficiaries (N)	t-stat
4,620.4	3,516.7	1.426
22,098.8	15,102.2	2.174**
3,568.5	2,773.7	1.336
2,995.2	2,210.3	1.772*
1,110.23	799.0	2.459**
5,075.2	4,195.9	0.989
39,468.33	28,597.7	1.917*
	Beneficiaries (₦) 4,620.4 22,098.8 3,568.5 2,995.2 1,110.23 5,075.2 39,468.33	Beneficiaries (ℕ) Non-beneficiaries (ℕ) 4,620.4 3,516.7 22,098.8 15,102.2 3,568.5 2,773.7 2,995.2 2,210.3 1,110.23 799.0 5,075.2 4,195.9 39,468.33 28,597.7

Table	2.	Mean	expenditure on	household	hasics	hv	heneficiaries	and not	n-benefi	icia	ries
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Source: Field survey, 2024; Note: *, ** and *** represents significance at 10%, 5% and 1% respectively.

Table 3 represents that the majority of the beneficiaries (90%) and non-beneficiaries (99) are below the 0.5 welfare level mark. This implies that as far as welfare is concerned, the majority of the cassava processors are not doing fine in terms of welfare.

Table 3: Welfare status of cassava processo

Welfare status	Beneficiaries	Non-beneficiaries
Low (≤ 0.5)	95 (90.00)	105 (99.06)
High (> 0.5)	1 (10.00)	1 (0.94)
Mean	0.2700	0.1835
tstat: 2 53**		

Source: Field survey, 2024; Note: *, ** and *** represents significance at 10%, 5% and 1% respectively.

The mean welfare score for the beneficiaries and non-beneficiaries are 0.27 and 0.18 respectively. This implies that although the two groups are in the low status of welfare, the microfinance loan beneficiaries were better-off. The test statistics of 2.53 relates that there is a significant difference between the welfare of the two groups.

Effect of microfinance loan on cassava processor's welfare.

According to Table 4, the correlation coefficients $\rho 1$ and $\rho 2$ for the selection equation with outcome equation for beneficiaries and non-beneficiaries, are significantly different from zero.



<u>ISSN (Print): 2651-6144; ISSN (Online): 2651-6365</u> Website: http://www.jasd.daee.atbu.edu.ng This indicates that processors who choose to opt for microfinance loan may have a higher welfare status than those processors who would be assigned at random. Also, it indicates the presence of sample selectivity biases. Furthermore, the likelihood-ratio tests for joint independence of the three equations for welfare (LR = 17.68, p = 0.047), indicate that the error term of selection equation, the error terms of outcome equations of both beneficiaries and non-beneficiaries, are jointly dependent. The ESR model estimates all the three equations which are the selection equation and the outcome equations for beneficiaries and non-beneficiaries by full information maximum likelihood (FIML) estimation as shown in Table 4. The second stage of ESR, estimates are discussed here since the results of the determinants, i.e., the first stage, were discussed in the

previous section. The model estimates of the variables against household welfare for microfinance loans beneficiaries and non-beneficiaries are presented in the third and fourth columns of Table 4 For the beneficiaries of the microfinance loan, the variables that are significantly and positively associated with welfare are household size and income from other source. This implies that beneficiaries have a greater chance of increasing their welfare with an increase in these variables. The cost of cassava tubers and cost of processing equipment associated negatively and significantly. This implies that as the cost of cassava tuber/equipments increases, there is a fall in the welfare status of the processor in the beneficiary group. With regards to non-beneficiaries, education, access to microfinance loan and household size were significant and associated positively. This implies that increase in these variables translates to increase in welfare amongst the non-beneficiaries. On the other hand, cost of processing equipment significantly and negatively associated with welfare for non-beneficiaries. This implies welfare falls as the cost of processing equipment increases (Mojo *et al.*, 2017; Wossen *et al.*, 2017; Kumar *et al.*, 2018; Yisa *et al.*, 2020; Dada *et al.*, 2023; Sanchi *et al.*, 2022).

Variables	Beneficiaries	of MFL		Non-beneficia	aries of MI	FL
	Coeff	Std err	p-value	Coeff	Std err	p-value
Processing experience (Years)	-0.334	0.447	0.457	0.291	0.409	0.479
Membership of association (Yes $= 1$;	453.01	2801.74	0.872	-0.329	0.246	0.183
No = 0)						
Household size	0.103***	0.033	0.003	0.193***	0.050	0.000
Income from other source (Naira)	0.427***	0.007	0.000	-0.178	0.137	0.196
Education (Years)	-1.061	0.848	0.216	1.098**	0.479	0.024
Cost of cassava tubers (Naira)	-0.060***	0.021	0.005	0.143	0.429	0.739
Cost of processing equipments (Naira)	-0.043**	0.019	0.023	-0.464***	0.015	0.002
Distance to market (Km)	-0.314	0.956	0.744	0.076	0.135	0.575
Income from cassava processing	-0.303	0.822	0.714	0.207	0.182	0.258
business (Naira)						
Labour costs (Naira)	-0.003	0.023	0.886	0.004	0.005	0.424
Interest rate	3.362	8.298	0.687	0.787	0.639	0.221
Access to Microfinance loan	-	-	-	0.208***	0.058	0.000
Sigma_1 0.122						
Sigma_2 0.042						
rho_1 0.544***						
rho_2 0.633**						
Prob > chi2 0.0000						
Log likelihood -77.5903						
LR test of Indep. 0.0470						

Table 4: Effect of microfinance loan on cassava processor's welfare

Source: Field survey, 2024; Note: *, ** and *** represents significance at 10%, 5% and 1% respectively.



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Finally, after estimating the parameters of the ESR model, the predicted household welfare status under actual and counterfactual conditions was estimated. The results are given in Table 7 The estimates of ATT indicates that microfinance loan significantly affects the outcome of both groups. For instance, households who are beneficiaries would have had a drop in welfare of about 10.3% less if they had not opted for the microfinance loan. This is an average treatment effect on treated (ATT), or the welfare gap between benefitting or not benefitting. Similarly, households who are non-beneficiaries would have earned about 33.1% in welfare increase if they had opted for micro loans, i.e., the average treatment effect on untreated (ATU). This welfare increase gained due to participation in micro loans and the potential benefits indicates that getting a microfinance loan has a strong positive and significant effect on welfare.

Table 7: ESR results: Average treatment effects

Outcome	ATT/ATU	Std Err.	t-test	P-value
Welfare status				
Beneficiary	0.103***	0.018	5.74	0.000
Non-beneficiary	0.331**	0.150	2.20	0.021

Source: Field survey, 2024; Note: *, ** and *** represents significance at 10%, 5% and 1% respectively.

CONCLUSION AND RECOMMENDATIONS

The study concluded that microfinance bank loans are instrumental in enhancing the welfare status of cassava processing women in Southwest Nigeria. The findings indicate that these loans are crucial for providing the financial capital necessary for women to expand their processing capacities. This expansion not only improves the productivity and efficiency of their operations but also significantly contributes to their economic empowerment and household welfare. To this end, it is therefore recommended that government agencies and financial institutions should collaborate with pertinent stakeholders to create policies that reduce barriers to accessing microfinance loans for cassava processing women. This could include lowered interest rate, provision of securities and guarantees, and simplification of loan applications and assessment.

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