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GENDER ACCESS TO MICROFINANCE BANKS' CREDIT AND PROFITABLITY OF CASSAVA PRODUCTION IN IMO STATE, NIGERIA

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ABSTRACT
This study investigated the gender inequalities in accessing microfinance credit for profitable cassava production in Imo State, Nigeria. Two-stage sampling technique was used to select 120 respondents comprising 60 male and 60 female cassava farming households. Structured questionnaire was used to collect data such as age, marital status, educational level, years of operating an account, savings in the bank, cooperative membership, collateral provision, amount of credit demanded and obtained by the farmers, as well as, costs of farm inputs and revenue of cassava output. Descriptive statistics, net income model and t-test statistics were used to achieve the objectives. The mean amount of credit obtained for female and male cassava farmers was N252,272.73 and N199,137.93 which was 80% and 76% of the amount of credit demanded respectively with the t-cal value of 0.021 less than t-crit.(5%). The farmers' net margins were N941,537.89 and N889,304.24 for female and male farmers respectively with t-cal value of 0.00138 less than t-crit.(5%). As evident from the analysis, gender of the farmers does not significantly influence their credit access and profitability in cassava production. Regression analyses showed that years of operating account, saving in bank and membership of cooperatives significantly influenced the amount of loan accessed by both gender. Cassava farmers of both gender are therefore encouraged to operate functional accounts with microfinance banks for a reasonable length of time, maintain substantial savings with the bank and form and/or join existing farmers' cooperatives to increase their access to microfinance credit and improve profitability of cassava production.

Keywords: Gender, credit assess, net income, years of operating account, cooperative membership

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INTRODUCTION
In spite of land area under cultivation for cassava production in Nigeria, the country still has lower cassava yield per hectare compared to Thailand, Brazil and Singapore (Anyanwu *et. al.,* 2012). This is consequent of the fact that cassava production in Nigeria is predominated by farming households who are faced with a mirage of problems. Such problems include illiteracy, possession and use of rudimentary implements, low farm size, lack of access to credit and inadequate skills for efficient resource combination to maximize output at minimum possible cost and therefore earn meager income from the venture (Obasi, Henri-Ukoha, Anosike & Ibekwe, 2015).

Among all the problems facing cassava production in the country, lack of credit is the most integral menace to efficient production. Ugwumba, Omojola, & Azifuaku (2014) emphasized that lack of credit access is a limiting factor to improving agricultural productivity. Rahji and Fakayode (2009)

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believed that agricultural credit access has particular importance in the context of agricultural and rural development in Nigeria because it has serious implications on farmers operation. The observation of Akpan. Ini-mfon Udoka, Offiong, & Okon, (2013) revealed that financial services sub-sector in Nigeria is largely skewed in favor of the non-agricultural activities which are believed to yield higher returns. The socio-economic characteristics of farmers, cassava farmers inclusive, make them unattractive to formal credit suppliers resulting to their low credit access from conventional banks. This predicament that farmers faced necessitated the establishment of Microfinance Banks to cater for these non-bankable categories. However, despite the monies pumped into the microfinance banks by the Central Bank of Nigeria (CBN), the farmers still complain of lack of funds to carry out their agricultural businesses. Farmers still lamented the difficulty experience in loan demand and disbursement largely due to their poor access to micro finance banks credit facility (Ugwumba *et al.,* 2014).

Empirical works on access to credit is inexhaustible, however most of them either separately investigated access to microfinance credit without recourse to gender perspective of the farmers or failed to establish gender differential in credit access and its linkage to farm profitability (Eze & Ibekwe, 2009; Shultz, 2007; Ololade & Olagunju, 2013; Owolabi, Abubakar & Amodu, 2011; Adinya, Ogbonna, Umoh & Idio, 2013; Jeiyol, Akpan, & Tee, 2013; Ugwumba *et al.*, 2014; Akpan *et al.* 2013; Ibrahim, & Aliero, 2012 and Orebiyi, Eze, Henri-Ukohia, Akubude & Ibitoye, 2011). It is the intention of this study to provide evidence based insight into gender inequalities in accessing credit for profitable agricultural activities particularly as it concerns the usage of microfinance banks' credit.

Methodology

Imo State is located in the South Eastern Zone of Nigeria (within the rainforest zone) and lies within latitudes $5^0 40^l$ and $7^0 5^l$ North and longitudes $6^0 35^l$ and $8^0 30^l$ East (Ohajianya & Onyeweaku, (2003): The State is divided into three main agricultural zones, namely Owerri, Okigwe and Orlu. It is further divided into 27 Local Government Areas. The State is characterized by tropical climate with high humidity and temperatures that range between 1500mm to 2300mm and 34^0C to 37^0C respectively (NPC,2006). The main crops grown in the area include cassava, cocoyam, yam, maize, melon and vegetables (green, fluted pumpkin, water-leaf, bitter leaf, etc). There are a number of Microfinance Banks (MFBs) that provide finance to agricultural operations and they are spread across the Owerri, Orlu and Okigwe Agricultural Zones of Imo State. Two-stage sampling technique was used for the study. In the first stage, two microfinance banks were purposively selected from each of the three Agricultural zones of the state to have six MFBs selected for the study. In the second stage, separate lists of male and female cassava farmers, who were customers of the bank and that demanded for loan facility were collected from each of the selected microfinance institutions and these formed the sampling frames for the study. At the third stage, random sampling technique was employed to select 60 male and 60 female cassava farming households from the sampling frame making a total of 120 respondents. The primary data was collected through the use of structured questionnaire which were administered to the respondents and personal interview in the course of the study. Structured questionnaire was used to collect data on age, marital status, level of education, amount of microfinance bank credit demanded and obtained, costs of farm inputs and revenue of cassava output. Descriptive statistics such as mean, percentage distribution, and frequency counts,

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net income model and t-test statistics were used to achieve the objectives of the study.

The net income model is given as:

$$TR = P_q Q \quad \ldots eqn\ 1$$

$$TVC = \sum P_x X_i \quad \ldots eqn\ 2$$

$$TC = \sum P_x X_i + TFC \quad \ldots eqn\ 3$$

$$GM = P_q Q - \sum P_i X_i \quad \ldots eqn\ 4$$

$$\pi = P_q Q - \sum P_x X_i + TFC \quad \ldots eqn\ 5$$

where: $\pi =$ net income, P_q = unit price of the output sold in the market,

Q = Quantity of the Output sold

TR = Total Return of the production, TVC = Total Variable Cost includes costs expended on land preparation, acquisition of planting material, weeding, fertilizer application, harvesting and transporting farm produce to the market, TFC = Total Fixed Cost comprise the cost of farm land purchased or hire, depreciation of farm tool such as cutlass, hoes or wheelbarrow and interest on borrowed loans, P_x = unit price of farm variable inputs used, X_i= Quantity of farm variable inputs used.

The t-test statistics was used to compare the amount of loan accessed and profitability of loan benefiting male and loan benefiting female cassava farmers' beneficiaries. This is specified as:

$$t_{cal} = \frac{U_1 - U_2}{\sqrt{\frac{\delta_1^2}{n_1 - 1} - \frac{\delta_2^2}{n_2 - 1}}} \quad \ldots\ldots\ldots\ldots eqn\ 6$$

Where

U_1 = Mean value of credit obtained/net farm income/ of loan benefiting male farmers

U_2 = Mean value of credit obtained/net farm income of loan benefiting female farmers

δ_1^2 = Variance of credit obtained/net farm income of loan benefiting male farmers

δ_2^2 = Variance of credit obtained/net farm income of loan benefiting male farmers

n_1 = Number of loan benefiting male farmers

n_2 = Number of loan benefiting female farmers

Decision criterion: The decision rule is that if t_{cal} is greater than t_{tab}, we reject the null hypothesis and accept the alternative hypothesis.

Results and Discussion

Socio-economic Characteristics of Cassava Farmers

Table 1 presents the socio-economic characteristics of the cassava farmers in the area, it is shown that the mean ages were 49.5 years and 44.5 years for female and male cassava farmers respectively and 31.67% of them were in age range of 41 – 50 years representing the mean class in both categories. Majority of farmers in both genders are relatively young and agile, and this result is similar to the findings of Ololade and Olagunju, (2013). However, female farmers have a higher mean age than their male counterparts. The mean educational level was 12.9 years and 13.1 years for female and male farmers respectively. About 90% of the female farmers had above primary education as against about 93.33% of the male farmers who had above primary education; this implies that male farmers are more educated than their female counterpart in the area which could enhances their ability to understand and evaluate new production technologies and this in extension have positive effect on their demand and utilization of credit. According to Orebiyi *et. al.,* (2011),

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the level of education of a person not only increases his farm net income but also enhances his ability to understand and evaluate new production technologies. The mean household size was 5 persons in the households of male and female headed farmers respectively. About 35% of the female headed households had more than average household size while 30% of the male headed households had a similar household size. This implies that female headed households had higher household size than male headed households although both farmer categories had adequate household size and each member is a prospective source of farm labour and stakeholder. However, large family size could have multiplier effect on the poverty status of the household as indicated by Adinya *et. al.*, (2013).

The mean farm experience was 15.15 years and 13.40 years for female and male farmers respectively. About 60% of the female farmers have above the average farm experience as against about 50% of their male counterpart with similar farm experience. This implies that female farmers had been into farming for a longer time than their male counterpart which could positively affect their cassava production profitably. According to Onyeneke and Iruo (2011), experience in farm business enhances output and performance. About 53.33% and 43.33% of female and male cassava farmers were married respectively, translate to large household size which would help in farming operations as a source of cheap labour as collaborated by Obasi *et. al.,* (2012). The mean farm size was 2.78ha and 2.08ha for female and male farmers respectively and more women cultivated cassava than their men counterpart as cassava production is predominant among women folks because it is easier to cultivate, harvest and process. This negates the findings of Akpan, *et. al.,* (2013) who stated that most rural farmers have farm holdings of less than 1ha. About 53.33% of the female farmers are members of cooperative societies while 61.67% of the male farmers are members of cooperative societies. It is indicative that male farmers belong to cooperative societies more than their female counterpart. Liverpool – Tasie, Kuku, and Ajibola, (2011) reported that membership of cooperative is an important social capital for accessing microfinance credit in Nigeria due to the identified importance of trust and homogeneity for social group performance.

Amount of loan demanded and obtained by cassava farmers in the study area by gender

According to Table 2, the mean amount demanded is N315,909.09 and N260,714.29 for the female and male cassava farmers respectively. The mean amount obtained was N252,272.73 and N199,137.93 for the female and male farmers respectively. On percentages basis, female cassava farmers obtained 80% of the amount of credit demanded as against 76% for their male counterpart. It is indicative that women farmers obtained higher amount than their male counterpart. The implication is that those that demanded and eventually accessed the credit could have obtained it from the bank after satisfactorily fulfilled necessary conditions in accessing microfinance credit. However, the denial might be due to failure to some of them to provide tangible collateral or third party guarantor as surety for the loan applied. The result of the t-test showed that t-calculated was 0.021 and lesser than t-critical value at 5% level of significant hence the null hypothesis of no significant difference between the loan accessed by female and male farmers in the study area was accepted, it implies that there is no significant difference between the amount of loan obtained by the female farmers and male farmers in the study area.

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Profitability of cassava production by cassava farmers by gender in the study area

As indicated in Table 3, the total variable cost expended on cassava production was 89.05% of total cost for the female farmers and 87.74% of the total cost for male farmers. The cost of planting and harvesting were 4.31% and 5.46% of total cost for the female farmers respectively and 4.19% and 0.94% of the total cost for male farmers respectively. The fixed cost accounted for 10.95% of the total cost for the female farmers and it was 12.26% for the male farmers. Also, cost of borrowed capital was 3.61% of the total cost for the female farmers and 3.22% of the total cost for the male farmers and the depreciation cost of assets was 0.69% of the total cost and 0.63% of the total cost for female and male farmers respectively. The value of cassava output was N1,616,370.00 and N1,558,200.00 for the female and male cassava farmers respectively, their gross margins were N1,015,457.53 and N971,303.83 for the female and male farmers respectively and the net margin were N941,537.89 and N889,304.24 for female and male farmers respectively. This gave net margin per hectare was given as N336,682.69/ha and N427,550.12/ha for the female and male farmers respectively. It could be inferred that both gender operated profitable business venture. The t-calculated was 0.00138 and less than t-critical value at 5% level of significant hence the null hypothesis of no significant difference between the net income of female and male farmers in the study area was accepted implied that there is no significant difference between the profitability of female farmers and male farmers in the study area.

Factors affecting the amount of loan accessed by the cassava farmers

Based on the result of the regression analysis of the female cassava farmers as presented in Table 4, Cobb-Douglas functional form was selected as lead equation because it has the highest R^2 value~~s~~ (0.8192) with F-value of 82.252 ($p<0.0.00$). The estimated coefficient of multiple determination (R^2) indicates that the variations in the explanatory variables in the model explained 81.92% in the variation of the amount of loan accessed by the female cassava farmers, the remaining 19.08% of the total variation in amount of loan accessed is explained by excluded variables from the regression (omitted variable) as captured by the error term.

The coefficients of educational level (1.3011), years of operating account (0.1848), major occupation (1.9455), provision of collateral (0.1429), farming experience (0.6777), amount of savings in the applicant's banks account (0.8181) and membership of cooperative organization (0.2802) were positive and significant at 5% showing that an increase in any of these variables will increase the chance of increased amount or full access to credit of the microfinance bank. For instance, a high level of education is an added advantage in terms of borrowing especially in formal financial institutions. Also, a lengthy period of operating a bank account help bank to check the borrower's character and ability to maintain a healthy relationship. In the same vein, ability of a farmer to present valuable collateral will increase his likelihood of accessing formal credit. The increased amount of savings in the bank will show how committed a customers is to the bank and will increased his/her chance of obtaining a large amount of loan from the bank. Equally, there is direct relationship between membership of cooperative society and microcredit repayment because of the benefit of social capital it offers. These findings are in term with Oboh and Ekpebu (2011) and Onyeagocha (2012) that obtained similar results. However, the coefficients of age (-0.1937) and household size (-0.4717) were negative and significant at 5% indicating that an increase in the age and household size of the female cassava farmer will result in

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decrease in the amount of loan accessed. It means that a relatively aged farmer with large household size may be considered as not capable to operate a viable cassava production The bank may be cautious of the fat that he may divert the funds to solve personal and family matters rather than investing it in cassava production. Adinya *et. al.* (2013) reported that similar findings.

For the male cassava farmers, exponential functional form was selected as lead equation because it has the highest statistically significant R^2 value (0.8257) with F-value of 48.795 ($p<0.0.00$). The estimated coefficient of multiple determination (R^2) indicates that the variations in explanatory variable used in the model explained 82.57% in the variation of the amount of loan accessed by the male cassava farmers, the remaining 17.43% of the total variation in amount of loan accessed is explained by excluded variables from the regression (omitted variable) as captured by the error term. The coefficients of age (0.1826), educational level (0.3581), years of operating account (0.1930), household size (0.2367), major occupation (0.3137), provision of collateral (0.3417) and farming experience (0.1296) were positive and significant at 5% showing that increase in any of these variables will increase the amount of loan accessed significantly. It is significant to note that aged male farmers with large households size received higher amount of credit unlike their female counterparts.

This might be attributed to the agility they exhibited at this age and ability to coerce their household members into farm labour. These findings are consistent with Ugbajah (2011), Udensi, Essien, Alobari, & Naenwi M-Epbari , (2014) and Ohajianya and Onyeweaku, (2003).

Conclusion and Recommendations

It was evidenced that gender of a cassava farmer is insignificant to amount of loan accessed and profitability of his/her cassava production venture. This negated existing literatures that indicated credit access parity between genders and its influence on profitability of agricultural venture. Based on the determinants of credit access across gender pointed out in the regression analysis, it is recommended that cassava farmers of both genders should to operate functional accounts with microfinance banks for a reasonable length of time, maintain substantial saving with the banks and form themselves into farmers' cooperatives or join existing ones to facilitate access to microfinance credits.

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APPENDIX

Table 1: Socioeconomic Characteristics of the Respondents

Socio-economic characteristics	**Female Farmers**		**Male Farmers**	
Age	Freq	%	Freq	%
21 – 30	3	5	7	11.67
31 – 40	9	15	15	25
41 – 50	19	31.67	19	31.67
51 – 60	19	31.67	15	25
61 – 70	10	16.66	4	6.66
Mean	**49.5years**		**44.5years**	
Educational level				
None (0)	1	1.67	0	0
Primary Edu. (1-6)	5	8.33	4	6.67
Secondary Edu.. (7-12)	16	26.67	22	36.67
B.Sc./HND (13-16)	26	43.33	19	31.66
Postgraduate Edu. (17-21)	12	20	15	25
Mean	**12.9years**		**13.1years**	
Household size				
1-3	21	35	21	35
4-6	24	40	21	35
7-9	12	20	14	23.33
10-12	3	5	4	6.67
Mean	**5persons**		**5persons**	
Farm Experience				
1-5	9	15	11	18.33
6-10	13	21.67	11	18.33
11-15	2	3.33	8	13.33
16-20	8	13.33	8	13.33
21-25	9	15	12	20
26-30	19	31.67	10	16.67
Mean	**15.15 years**		**13.40 years**	
Marital Status				
Single	10	16.67	12	20
Married	32	53.33	26	43.33
Widowed	10	16.67	10	16.67
Divorced	8	13.33	12	20
Farm size (ha)				
< 1	17	28.33	23	38.33
1 – 3	22	36.67	24	40
4 – 6	18	30	13	21.67
7 – 9	3	5	0	0
Mean	**2.78ha**		**2.08ha**	

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Co-operative Membership				
Yes	32	53.33	37	61.67
No	28	46.67	23	38.33

Field Survey, 2020

Table 2: Amount of loan demanded and obtained by cassava farmers by gender

	Female Farmers		**Male Farmers**	
Amount demanded	**Freq**	**%**	**Freq**	**%**
0 (None)	16	26.67	11	18.33
50,000 – 100,000	3	5.00	7	11.67
150,000 – 200,000	7	11.67	18	30
250,000 – 300,000	13	21.67	10	16.67
350,000 – 400,000	13	21.67	4	6.67
450,000 – 500,000	6	10	9	15
Above 500,000	2	3.33	1	1.67
Total	60	100	60	100
Mean	**N315,909.09**		**N260,714.29**	
Amount obtained				
0 (None)	38	63.33	31	51.67
50,000 – 100,000	2	3.33	6	10
150,000 – 200,000	8	13.33	12	20
250,000 – 300,000	6	10	10	16.67
350,000 – 400,000	5	8.33	0	0
450,000 – 500,000	1	1.67	1	1.67
Total	60	100	60	100
Mean	**N252,272.73**		**N199,137.93**	
Amount demanded (AD)		N315,909.09		N260,714.29
Amount obtained (AO)		N252,272.73		N199,137.93
% loan obtained = (AO/AD)*100		80		76
Ho: $AO_f = AO_m$				
t-cal				**0.021**
t-tab (5%)				**1.980**

Source: Field Survey, 2020

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Table 3: Profitability of cassava production by farmers that accessed the Mfb loan's by gender

	Female				Male			
Items	**Qty**	**Unit price**	**Total value**	**%TC**	**Qty**	**Unit price**	**Total value**	**%TC**
Cost of cassava stem	75.32	593.17	44,678.52	6.62	169.61	546.19	92,638.77	13.85
Labour on slashing	4.39	2,789.52	12,240.35	1.81	19.47	2,468.52	48,051.27	7.18
Labour on ridging	43.54	4,492.31	195,588.17	28.98	39.92	3,582.59	143,028.85	21.38
Labour on moulding	13.96	3,825.44	53,396.83	7.91	18.69	3,137.24	58,636.45	8.77
Labour on planting	13.80	2,107.16	29,078.76	4.31	18.13	1,547.65	28,058.93	4.19
Labour on fertilizer application	25.85	2,040.32	52,742.16	7.82	36.89	1,970.60	72,698.21	10.87
Labour on weeding	18.53	5,719.85	105,988.80	15.71	24.33	2,369.36	57,649.79	8.62
Labour on harvesting	31.60	1,162.81	36,750.25	5.45	3.56	1,771.79	6,308.40	0.94
Cost of fertilizer	5.73	10,262.50	58,804.13	8.71	4.54	15,147.58	68,770.00	10.28
Cost of chemicals	5.50	1,221.21	6,716.67	1.00	5.09	1,396.77	7,110.85	1.06
Cost of manure	11.57	425.86	4,927.83	0.73	10.18	387.63	3,944.65	0.59
Total variable cost			**600,912.47**	**89.05**			**586,896.17**	**87.74**
Rent on farmland	4.42	10,152.73	44,826.88	6.64	5.21	10,805.63	56,340.91	8.42
Dep_shovel			302.00	0.04			262.00	0.04
Dep_hoe			339.47	0.05			373.33	0.06
Dep_cutlass			270.00	0.04			322.38	0.05
Dep_basin			473.33	0.07			480.50	0.07
Dep_bicycle			1705.00	0.25			1382.25	0.21
Dep_wheelbarrow			1358.89	0.20			915.65	0.14
Dep_watercan			291.25	0.04			407.22	0.06
Total Depreciation cost			4,739.94	0.69			4,143.33	0.63
Cost of capital borrowed			24,352.82	3.61			21,515.35	3.22
Total fixed cost			**73,919.64**	**10.95**			**81,999.60**	**12.26**
Total cost			**674,832.11**	**100.00**			**668,895.76**	**100.00**

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Cassava output sold	15.39	105,000.	**1,616,370.00**	14.84	105,000.00	**1,558,200.00**
Gross margin = TR – TVC			1,015,457.53			971,303.83
Net margin = GM – TFC			941,537.89			889,304.24
Average farm size			2.78			2.08
Net margin per ha			336,682.69			427,550.12
Ratios						
Operating return = TVC/TR			**0.37**			**0.38**
Gross ratio = TC/TR			**0.42**			**0.43**
Fixed ratio = TFC/TR			**0.05**			**0.05**
Rate of return on Investment = NM/TC			**1.40**			**1.33**

Source: Field Survey Data, 2020

Testing the significance difference between profitability of female and male cassava farmers (t-cal) = 1.377e-3

t-crit (5%) = 2.001