jotaf
Journal of Tekirdag Agricultural Faculty
Tekirdağ Ziraat Fakültesi Dergisi

Mayıs/May 2022, 19(2)
Başvuru/Received: 24/01/21
Kabul/Accepted: 27/12/21
DOI: 10.33462/jotaf.867593

http://dergipark.gov.tr/jotaf
http://jotaf.nku.edu.tr/

ARAŞTIRMA MAKALESİ **RESEARCH ARTICLE**

Agricultural Bank Credit Intervention and The Application of Big Push Theory to Beneficiaries: Evidence From Nigeria

Theophilus Miebi GBIGBI

Abstract

Up till now there is shortage of empirical evidence on volume of loan received that generates big push for the farmers and the bank to curtail abuse of fund and its determinants. The purpose of this study is to examine the agricultural bank credit intervention and the application of big push theory among beneficiaries in Nigeria so as to make advocacy for a bailout intervention. A total of 295 beneficiaries were randomly selected. A questionnaire was developed, and data collection was undertaken by means of a multistage sampling technique. Descriptive statistics, regression model and t-test analysis were used to analyze the data. The mean age of beneficiaries was 46 years old. The respondents had an average household size of 6 persons with 79.3% of the beneficiaries being literate with one form of formal education or the other. About 65.4% of the beneficiaries did not subscribe to membership of farmers groups. The beneficiaries had 13 years' experience in arable crop farming. The average farm size was 1.57 ha. This tells us that the beneficiaries were small scale farmers. The result reveals that the region of big push was between $244.34-$977.37 The variables that had positive and substantial relationship with big push in the model were age of respondent, years spent in farming, education, farm size, cooperative membership, household size, collateral requirement and marital status. The outcome of the t-test indicated that there was much impact after benefiting from agricultural bank credit loan scheme in the area. The foremost constraints were collateral requirement and high interest rate. Loan acquisition procedure by agricultural bank credit should be made easier as well as the threshold of farmers financial management ability should be considered during disbursement of loan to farmers for effective utilization.

Keywords: Loan, Arable crop farmers, Agricultural bank credit, Big push, Loan threshold

Sorumlu Yazar/Corresponding Author: Theophilus Miebi GBIGBI, Department of Agricultural Economics and Extension Delta State University Asaba Campus, Asaba. E-mail: gbigbitheophilusmiebi@yahoo.com OrcID: 0000-0002-1335-7231
Atıf/Citation: Gbıgbı T.M. Agricultural Bank of Credit Intervation and The Application of Big Push Theory To Beneficiaries From Farmers: Evidence From Nigeria. . *Tekirdağ Ziraat Fakültesi Dergisi,* 19 (2), 237-247.

1. Introduction

Measures on food security and poverty alleviation have a very significant impact on the performance of farmers as most farming activities are undertaken by resource-poor farmers. Agricultural loan financing has been identified as a means of transforming the agricultural sector and revamping the Nigeria economy. According to Agbo et al. (2015) the availability of loans helps farmers to purchase non-accessible farm inputs to increase production. Having access to loan will improve grass root development by increasing their output that will improve their standard of living, enhance their use of modern technologies and enhance ways of improving their output and pay back the borrowed fund. The expansion of credit facilities is believed to have a significant positive impact on the agricultural output of farmers and income because loans would boost the acquisition of costly inputs and the adoption of alternative crops (Sarker, 2016). The availability of loans can enable the farmers to use and implement state-of - the-art technology and provide inputs for farm use so as to increase productivity and revenue (Abdallah, 2016). As such, household income growth is extremely important to ensure food security and will eventually be achieved through improved technology and increased outputs from productivity in agriculture. Access to financial markets for farmers thus influences farm productivity and income significantly (Akudugu, 2016). This led to the formation of Agricultural bank credit (ABC) to address the challenges of loan supply. ABC has been identified by making available appropriate financial intermediation to the people, who are mostly unable to provide essential collateral for access to loans from the mainstream finance market. Their aim is to influence the rural economy directly by contributing to poverty eradication.

Agricultural credit can contribute to economic development by intensifying agricultural output and its associated occupations. Credit has been a prominent feature of the strategies that have been put in place in recent years for developing world agricultural sector growth. In most strategies, credit was incorporated among the necessary constituents. Such constituents include technical support, land reform and market supply of inputs and outputs.

Small-scale farmers are often the main food producers in Nigeria. Efforts to increase the agricultural output level and boost farmers' well-being have led to ever greater loans for the agrarian sector. Hence, Semerci and Celik (2017) considering the beneficiaries status, studied the impact of agricultural subsidy to boost production of dairy cattle enterprises, reduce milk production cost, and increase farmer income in Turkey. The rural sector is comprised mainly of small-scale farmers with a low level of production. These farmers have to compete for any financial resources available with the big farmers. Any effort to increase agricultural production must first focus on the smallholder farmers who earn a limited proportion of institutional credit. In spite of this uniqueness, credit accessibility has been limited. The difficulty of smallholder farmers who produce more than 85% of domestic food supply to participate in agricultural loans has remained a fundamental problem. They usually operate subsistence agriculture, small farm sizes, with limited resources and capital as a result of which their farming business is managed from personal savings (Sadiq et al., 2015). Adequate financing for technological adoption and agricultural growth is required for small farmers.

Observations showed that sometimes farmers had difficulties of benefiting from available loan due to certain socioeconomic constraints such as level of education, accessibility to financial institution, farm size, membership of associations, contact with extension agents, and so on (Akinwale et al., 2016; Agbo et al., 2015). The unforeseen circumstances surrounding agriculture have made it an uphill task for farmers to obtained loan from financial institutions. Most financial institutions scare away the farmers with high interest rates and tedious procedures in obtaining loans. This has discouraged farmers from seeking financial help from financial institutions and arable crop farmers are no exception.

Smallholder farmers have limited access to loan facilities thereby complain of inadequate production resources. The focus on financial aid is not surprising since limited finance and loans are some of the major problems faced by the agricultural sector (Food and Agriculture Organization (FAO, 2016). Because of the restricted financial situation and inability to obtain formal loans, farmers often borrow from informal sources to pay an exorbitant interest rate, which ensures that at the end of the production season, they are left with an unreasonable net farm income. The meagre income generated by farmers is generally used for smoothing consumption, and there is nothing left to invest in agricultural resources (Sadiq et al., 2015). This makes the farmer unable to switch from peasant farming to large-scale agriculture so as to increase food self-sufficiency and diversify the economy from

its mono-component status. This research work was centered on the theory of big push which advocates investment to break the vicious circle of poverty. According to the theory of big push by Rosenstein-Rodan (1961 as cited in Currie, 2016) emphasized that countries have to move faster from one point to another to promote their own economies because moving slowly does not lead them effectively and adequately to the path of development. The theory implies that big push will enable the crop industry to move faster. The concept behind big push theory is that a large-scale investment package could help bring financial growth. In other words, for a given loan to be meaningful to a farmer, a certain minimum amount of loan should be allocated for development. This idea is that no farmer can advance along the path of economic development by "Bit by Bit" fund allocation**.** To constantly decrease poverty, the performance of the loans given by financial institutions to the beneficiaries is a crucial factor of success (Sofayo, 2017). Promoting principles in the raising and delivery of funds and questioning the absorptive capacity of beneficiaries will balance the effective flow of fund efficiency**.** A balanced growth is necessary to break the vicious circles of capital supply and demand. As such, to push the farmers out of a stagnation trap a clear statistical link between the extent of the needed push and the amount required must be established. In giving out loan the absorptive capacity of the farmers is crucial because high amount of loan beyond a certain threshold, could cause serious problem for growth. Loan volatility means the danger of a rapid loan increase beyond the management control of the farmers and financial institutions disbursing the loan (D'Espallier et al., 2016). Loan, if volatile, might be a source of macro-economic instability showing that the loan level is high beyond the control of the farmer. This can be a way by which absorptive capacity is revealed. The resultant outcome is a decreasing marginal impact of loan on growth. In order to avoid the risk of Dutch Disease affecting the fund absorptive capacity of the farmers on the loan accessed, development strategies should be tailored on loan management.

The past authors (Agbo et al 2015; Akudugu, 2016) based their research on accessibility to credit without examining how much the bank would actually give the farmers in order to maintain their sustainability. Analysis of the farmer's financial potential using big push as the basis line is strategically important. Financial intervention program needs information on the absorptive ability of the farmers to address the long-standing loan default issue. This would be a basic mechanism for achieving financial sustainability in the field of research in the crop industry.

Although the theory of big push is old but it has not been applied to the agricultural sector financing before now. Econometric data that account for structural defects, policy limitations, and inadequacies, including the quality and quantity of the loans paid out by financial institutions is lacking. Different studies to estimate the impact of agricultural loans have been carried out, but in the context of Delta State, studies have not determined the level of loans to create a big push for farmers from the ABC fund**.** This study was therefore designed to fill this important information gap.

The broad objective was to evaluate the big push status on agricultural bank credit beneficiaries in Delta, Edo and Bayelsa States, Nigeria. The specific objectives of the study were to;

i. identify the socioeconomic characteristics of the beneficiaries
ii. determine the impact level of ABC loan
iii. determine the big push financial baseline
iv. estimate the determinants of big push status on ABC beneficiaries
v. ascertain the constraints affecting loan access by respondents

The hypotheses tested in the study were:

H_{O1}: There is no significant difference between income level of farmers before and after ABC loan intervention
H_{O2}: There is no significant difference between output level of farmers before and after ABC loan intervention
H_{O3}: There is no significant difference between farm size of farmers before and after ABC loan intervention

2. Materials and Methods

2.1. Study area

The study covered agricultural bank credit involved in agricultural loan delivery in Delta, Edo and Bayelsa states of Nigeria. This area was chosen for the study because the major economic activities of the people is farming; with inadequate finance as one of their challenges. A multistage sampling technique was adopted in the selection of banks and small-scale arable farmers. Firstly, there was a visit to the agricultural bank credit branches in each

state to obtain the list of all the registered beneficiaries. In stage 2, two BOA branches were randomly selected from each state giving a total of six BOA branches. These were Asaba, Ughelli, Benin, Irrua, Yenagoa and Sagbama. In stage three, Ten percent (10%) of the identified loan beneficiaries were randomly selected. This gave a total of 295 respondents who were involved in the selection as presented in *Table 1*. The data for this study were obtained from primary data. Primary data were collected using structured questionnaire. Descriptive statistics, t-test and multiple regression analysis were used to analyze the data. The study used income level, output level and farm size before and after the credit intervention as proxy for big push

Table 1. Distribution of selected beneficiaries

Branches	Number of registered beneficiaries	10% of loan beneficiaries
Asaba	850	85
Ughelli	400	40
Benin	620	62
Irrua	450	45
Yenagoa	380	38
Sagbama	250	25
Total	2950	295

2.2. Model Specification

The regression model (Eq.1) was employed to achieve objective (iii) and it is explicitly stated as:

$$ALOA = \beta_0 + \beta_1 Age + \beta_2 Gen + \beta_3 Hhs + \beta_4 Edu + \beta_5 Fexp + \beta_6 Collreq + \beta_7 Msta + \beta_8 Cosoc + \beta_9 Fmsz \quad \text{(Eq.1)}$$

Where,

ALOA = amount of loan accessed ($)(proxy for big push)
Age = age of farmers (years)
Gen = gender (1 = male, 0 = female)
Hhs = household size(number)
Edu = educational attainment (schooling years)
Fexp = farming experience (years)
Collreq= collateral requirement (1=yes, 0 =No)
Msta = marital status (1 = married, 0 = single)
Cosoc = cooperative society (1 = member, 0 =non-member)
Fmsz = farm size (hectares)
b_0 = constant intercept
$b_1 \ldots b_9$ = the coefficient corresponding to $x_1 \ldots x_9$
The t-test was used to achieve the impact as represented below (Eq.2):

$$t = \frac{M1 - M2}{\sqrt{\frac{SD1^2}{N1} + \frac{SD2^2}{N2}}} \quad \text{(Eq.2)}$$

For income, where;
M_1 = mean income of farmers before ABC loan $
M_2= mean income of farmers after ABC loan (₦
SD_1^2 = variance of income of farmers before ABC loan $
SD_2^2=variance of income of farmers after ABC loan $
N_1 = number of farmers before ABC loan
N_2 = number of farmers after ABC loan
For output, where;
M_1 = mean output of farmers before ABC loan (tons)
M_2= mean output of farmers after ABC loan (tons)
SD_1^2 = variance of output of farmers before ABC loan (tons)

SD_2^2=variance of output of farmers after ABC loan (tons)
N_1 = number of farmers before ABC loan
N_2 = number of farmers after ABC loan
For farm size, where;
M_1 = mean farm size of farmers before ABC loan (ha)
M_2= mean farm size of farmers after ABC loan (ha)
SD_1^2 = variance of farm size of farmers before ABC loan (ha)
SD_2^2=variance of farm size of farmers after ABC loan (ha)
N_1 = number of farmers before ABC loan
N_2 = number of farmers after ABC loan

3. Results and Discussion

3.1. Socio-economic characteristics of beneficiaries

Most (45.8%) of the beneficiaries were in the age bracket of 46-55 years with a mean age of 46 years *(Table 2).*

Table 2. Socio-economic characteristics of ABC beneficiaries (N= 295)

Variables	Frequency	Percentage	Mean/Mode
Age distribution (years)			
25-35	32	10.8	
36-45	98	33.2	
46-55	135	45.8	
56-65	30	10.2	46 years
Household size			
1-3	48	16.3	
4-6	149	50.5	
7-9	87	29.5	6 persons
10-12	11	3.7	
Educational status			
No formal education	61	20.7	
Primary education	73	24.7	
Secondary education	126	42.7	Secondary education
Tertiary education	35	11.9	
Group membership			
Yes	102	34.6	
No	193	65.4	Non- members
Farming experience			
1-5	15	5.1	
6-10	69	23.4	13 years
11-15	110	37.3	
Above 15	101	34.2	
Farm size (ha)			
Less than 1	27	9.2	
1	124	42.0	1.57 ha
2	106	35.9	
3 and above	38	12.9	

Source: (Field survey, 2020)

This suggests that they were middle aged and still active. Therefore, has the potential to be involved adequately for loan scheme. This is consistent with Gbigbi (2021) who reported farmers age between 40-59 years in Delta State. The beneficiaries had mean family size of 6 persons, indicating large household sizes among the arable crop beneficiaries. Majority (42.7%) of them having acquired secondary education, as 24.7% had primary schooling and 11.9% had tertiary education while 20.7% had no formal education. This suggest that the beneficiaries in the area are literate. This situation could have a positive impact on the productivity of the beneficiaries as most of them could possibly read and write. Educational attainment enables them to know sources of credit and ascertain

business potentials to improve the monetary base of the farm. The result concur with Ibitoye (2010) who made similar observation in Kogi State.

Many (65.4%) of the respondents did not subscribe to membership of farmers groups. This has implications for access to loan. This could have the tendency to hinder them from accessing loan easily for farming activities in the study area. The respondents had an average of 13 years' experience in arable crop farming. This implies that crop farming is an age-long venture for the respondents. The result infers that number of years spent on farming would have built a relationship between the farmer and the bank to easily access credit for increase production. The more years of farming spent could increase the capital accumulation of the farm for easy credit access.

Finally, it was revealed that most (42.0%) had between 1 hectare while 35.9% of the respondents had 2 hectares and also 12.9% cultivated 3 hectares plus and 9.2% had less than 1 hectare. The average farm size of the respondents was 1.57 ha. This tells us that the respondents were small scale farmers since the size of farmland was affected by land tenure system.

3.2. Income status of respondents before and after agricultural bank credit loan

The result in *Table 3* showed that the mean income of the beneficiaries before receiving ABC loan of between $244.34-$977.37 was $334.13 but after participation in the loan scheme, the income increased to $590.54. There was an income rise with a difference of $256.41. The result indicates a 76.74% big push among the surveyed beneficiaries. It was expected that when the beneficiaries adequately used the loan obtained to make purchases of farm inputs such as planting materials, implements, fertilizer and pay labour for sustainable production, the income will improve. This is the amount of income needed to bail-out the farmers. This results support Gbigbi (2021) finding that farmers with more access tend to have higher competency level. The result showed that the average income earned by the farmers before ABC loan of less than $244.34 was $142.52 but after benefiting from the scheme there was a positive shift of income to $204.42 giving 43.43% impact. The farmers who received income of between $977.37-$1710.39 before ABC loan had income of $834.38 but after the loan had higher income of $1291.75or 54.82%. Similarly, the beneficiaries of $1710.40-2443.42 before and after ABC loan experienced an increase of $1758.89 to $2130.54 with difference of $371.65 or 21.13%. Income class of above $2443.42 shows a shift from $3395.45 before accessing ABC loan and $4050.21 after benefiting the loan with increase of 19.28%. It implies that the beneficiaries of the selected ABC experienced an improvement in income after accessing the loan facilities than before participation thus justifying Lu and Hassan (2011) study on the effect of micro-loan programme on rural poverty alleviation in Monirampur Upazila in Bangledesh that loan programmes are performing well enough to bring better quality of life for the borrowers in the area by increasing their income, food consumption and living standard. The result suggests that the safe region for loan disbursement is the big push for both the farmers and the financial institution.

Table 3. Income status of respondents before and after agricultural bank credit loan

Loan threshold ratio ($)	Average Income before($)	Average income after($)	Income difference	% increase (impact)	Remark
< $244.34	142.52 (25.4%)	204.42 (9.5%)	61.90	43.43	
$244.34-$977.37	334.13 (50.5%)	590.54 (38.3%	256.41	76.74**	Big push
$977.37-$1710.39	834.38 (18.6%)	1291.75 (36.9%)	457.37	54.82	
$1710.40-$2443.42	1758.89 (4.1%)	2130.54 (9.2%)	371.65	21.13	
>$2443.42	3395.45 (1.4%)	$4050.21 (6.1%)	654.76	19.28	

Source: (Field survey, 2020)

3.3. *Contributing factors of big push*

The result in *Table 4* showed that the linear regression model was chosen as lead equation based on the level of R^2 value of 0.5830 and number of significant explanatory variables implying that 58.3% variability in amount of loan accessed was explained by the independent variables included in the model. The coefficient of age was positively significant at 5% probability. This indicates that a unit increase of the age of respondents will lead to a corresponding decrease in the amount of loan accessed from agricultural bank credit. This was because farmers that were older by age were considered to be ineffective. This result is in agreement with Asogwa et al. (2014) findings that inverse relationship exists between age and loan accessibility in Nigeria.

The variable household size was positive and statistically significant at 5% level. This implies that an increase in household size of the respondent will lead to a corresponding increase in the volume of loan accessed. This is because as the numbers of the members of the farmers' household increases, the farmer has a cheap source of labour which paves way for increased productivity and the possibility of the farmer to pay back the loan borrowed. Also, if the members of the household are gainfully employed, it will increase the ease of repayment as the household members might contribute to that effect. The result is consistent with Edet et al. (2017) earlier findings that an increase in the number of household members tends to increase farmers' household spending which increases the farmers' likelihood of demanding credit facilities for agricultural production.

Table 4. Contributing factors of big push

Variable	*Parameters*	*Linear*	*Semi-log*	*Exponential*	*Double-log*
Age(years)	X_1	0.3256457	51995.15	-6.89e-07	0.0771409
		(2.12)**	(-3. 35)***	(-0.68)	(-3.29)**
Gender	X_2	33540.47	4298.599	0.0578525	0.007523
		(1.27)	(1.58)	(0.91)	(1.70)
Household size	X_3	0.1835633	-60546.74	-0.0000112	-0.0831077
		(2.06)**	(-0.75)**	(-0.82)	(-0.37)
Education	X_4	8466.472	250861	0.0132236	0.4192702
		(5.02)***	(1.59)	(4.88)***	(4.20)***
Farming experien	X_5	49892.55	91346.54	0.0901201	0.1686359
		(5.06)***	(0.89)	(2.70)**	(4.52)***
Collateral demand	X_6	23822.06	60825.13	0.0315788	0.0839502
		(4.32)***	(2.62)**	(3.57)***	(1.28)
Marital status	X_7	94391.04	197355.5	0.1663004	0.3388996
		(3.43)**	(2.82)**	(1.67)	(2.21)**
Cooperative membership	X_8	16888.89	128348.1	0.0228168	0.185657
		(4.30)***	(3.21)**	(3.42)**	(4.74)***
Farm size	X_9	163776.4	230909.3	0.345894	0.4881234
		(7.29)***	(7.22)***	(9.60)***	(-.61)***
Intercept	b_0	630287.7	2404006	13.37907	16.24467
		(8.54)***	(6.80)***	(13.02)***	(28.93)***
R^2		0.5830	0.5523	0.5540	0.5301
F-ratio		44.23	39.02	48.02	35.68

Source: (Field survey, 2020) *, ** and *** is significant at 10%, 5% and 1% level of probability

The coefficient of education was positive and significant at 1% probability level, this conforms to a priori expectation. The implication is that an increase in educational status will leads to an increase in the farmer's ability to access loan. This might be as a result the exposure that comes with education. Farmers who are educated make better decisions in choosing loan options and the requirements that comes with it. Adegbite and Adeleye (2011) found out that higher educational qualification of the farmer increases his chances of accessing loans.

The coefficient of farming experience was positive and significant at 1% level of probability, which agrees with a priori expectation. This implies that any increase in farming experience will lead to a corresponding increase in loan accessibility**.** The findings from Nouman et al. (2013) show a positive connection between access to agricultural credit and farming experience. In addition, Yehuala (2008) has noticed that farmers with a greater agricultural background have much stronger ties to cooperatives and other established credit sources such as established banks and NGOs. As a result, experienced farmers would be more likely than unexperienced farmers to receive loan from financial institutions. This result is in line with other research results (Akudugu et al., 2012).

The variable collateral requirement was positive and significant at 1% level. This means that the higher the ability to secure collateral, the higher the possibility of the farmer acquiring the required loan. This is because most of the financial institutions usually demand collaterals before given out loan to farmers due to high default rate. The variable marital status had a positive coefficient and has significant effect on loan access at 1% level. The positive relationship between the marital status of the farmers and their ability to access loan is because married farmers are perceived to be responsible and far-sighted with finance than unmarried individuals; as a result, the loan facilitators rely on their strength of financial responsibility and through that can liberally give them loan. The result concurs with Ololade and Olagunju (2013) that married loan applicant stood a better chance to obtain loans than those who were single. The coefficient of cooperative membership was positive and significant at 1%.

This means that membership of cooperative society is a strong determinant of loan accessibility and concurs with a priori expectation. This is because cooperative societies usually aide their members when they want to access loan facilities. They also act as trustees or agents of the farmers. The findings are congruent with Beck's (2007) that establishment of farmers' groups empowers them to develop their agricultural techniques and managerial skills, thus reducing transaction costs and making collective action more advantageous. Group participation and commitment, control and improve credit access as they collectively guarantee members' loans (Akudugu, 2012).

The variable farm size bore positive relationship with the amount of loan accessed by the farmer. This means that a unit increase in farm size of the farmer the more likelihood of equivalent increase in the amount of loan access. Elias et al. (2015) opined that large land holdings increased the probability of the farmer accessing loans from financial institutions as the farmer can cultivate in large quantities with improved technology to offset his debts.

3.4. Constraints affecting loan access by respondents

The result in *Table 5* showed that majority 60.3% of the respondents agreed that collateral requirement needed by financial institutions limits their access to loan in the study area. Most farmers in the study area are poor and do not have the needed collateral to access loans that would influence big push. Often times, financial institutions scare away the farmers with high collateral requirements.

Table 5. Constraints affecting loan access for big push by respondents

Constraints	Frequency	Percentage	Rank
Collateral requirement	178	60.3	1st
Interest rate	162	54.9	2nd
Distance	156	52.9	3rd
Loan rationing	144	48.8	4th
Repayment rate	139	47.1	5th
Loan default	138	46.8	5th
Awareness level	133	45.1	7th
Bureaucratic process	124	42.0	8th

Source: (Field survey, 2020) *Multiple responses*

The result concurs with Okojie et al. (2010) study on access to financial services by rural women in Edo state. About 54.9% of the farmers complained of high interest rate which dissuade them loan access. The interest rate charged by financial institutions is on the high side for the farmers. This has affected farmers patronage of formal financial institutions. Hence the government established loan scheme with low interest rate to ensure farmers access to agricultural loan **(**Mgbenka and Mbah, 2016**)**. Distance was identified by 52.9% of the respondent as a factor affecting access to loan. Most farmers complained that the distance travel from resident to locations of financial institution increase their transaction cost beyond control. Loan rationing was also a limiting factor to farmers' access to loan as opined by 48.8%. When the actual amount needed for a production is not obtained then room for further agricultural expansion cannot be guaranteed.

3.5. Testing of Hypotheses

3.5.1. Effects of big push on beneficiaries income, output and farm size

The result in *Table 6* indicated the mean income of the beneficiaries of the ABC loan before and after participation. Before participation the mean farm income of the beneficiaries was $1430.42 while after the participation the mean income was $ 4229.17. This result signified that after the participation the farm income of the beneficiaries had considerably increased. This is because there was increase in the average farm income of the beneficiaries by $2798.76. This also implies that after the participation of ABC loan scheme, the living standard of the beneficiaries has gone far above the poverty line (i.e above $1 dollar per day). This is an indication that ABC has contributed positively to the mean income of the beneficiaries. The result of t-test analysis on income in *Table 7* showed the value of (t=15.07 < P 0.05) level. This means there was a significant difference in the mean income of the beneficiaries after accessibility of ABC loan. This means the loan accessed has enable them to purchase inputs for increased production and adoption of new technologies applicable to the vocation. The participation of farmers in the ABC scheme had tremendously brought empowerment, improved their skills and

investment power in farm and non-farm activities. This suggests that participation in ABC loan scheme has brought about remarkable increase in beneficiaries' income compared to when they did not participate in the scheme.

The result in *Table 6* further revealed the mean output of the beneficiaries before and after participation in ABC loan scheme. Before ABC loan the beneficiaries' mean farm was 1.73 tons while after the benefiting, the output was 3.21 tons. This showed that the mean farm output of the beneficiaries increased positively by 1.48 tons. The increase in farm output could be attributed to the ABC scheme through funding of projects and training the beneficiaries received which helped them in effective utilization of borrowed loan for economic activities. This indicates that there was a positive change in the economic activities of the beneficiaries for improved production. The result indicate further that the participation in ABC intervention has brought a significant difference between output before and output after (t= 13.60 < p 0.05). This is an indication that the ABC has significantly increased the farm output of respondents. This could be because they would engage in sustainable farming, which would increase their output for income generation. The findings showed that the big push is the best amount for both ABC and the farmers in loan disbursement. This is agreement with Ani (2014) that Fadama III significantly increase the income of participants in Nigeria.

Table 6. T-test on selected variables before and after big push

Paired	Variables	Mean	Mean difference	Std. Deviation	T	Df	Sig(2-tailed)	Remark
Pair 1	Income before ABC ($)	1430.42	2798.76	17.67	15.07	294	0.000	Significant impact
	Income after ABC ($)	4229.17						
Pair 2	Output before ABC (tons)	1.73	1.48	1.683	13.60	294	0.000	Significant impact
	Output after ABC (tons)	3.21						
Pair 3	Farm size before ABC (ha)	1.12	1.56	0.83	11.28	294	0.000	Significant impact
	Farm size after ABC (ha)	2.68						

Source: (Field survey, 2020)

The impact of ABC on beneficiaries was determined by comparing their farm size before and after they became beneficiaries. The mean farm size before ABC was 1.12ha which increased to 2.68ha after benefiting. The result revealed that there is a mean difference of 1.56ha in the farm size of beneficiaries after becoming participants of ABC scheme. The difference in farm size was significant at (t= 11.28 < p 0.05) level of significance. This is an indication that ABC has significantly increased the farm size of respondents. This could be because they would engage in sustainable production to increase their output and income. It implies that the beneficiaries of the selected ABC experienced an improvement in farm size after accessing the loan facilities than before participation. This concurs with Abdullah et al. (2016) study on women participation in credit programme in Malaysia. Similarly, this study agrees with Gbigbi (2020) on the impact of an intervention on farmers output, income and farm size in Nigeria

4.Conclusions

The big push intervention from agricultural bank credit scheme on farmers beneficiaries in Nigeria was investigated in this study. Results show that the region of big push was between $244.34-$977.37. The result reveals that there was substantial improvement as a result of the big push. Big push of the farmers was influenced by age, household size, education, farming experience, collateral requirement, marital status, cooperative membership and farm size. The outcome of the t-test also shows that agricultural bank credit loan had positive effect on smallholder farmers' income, output and farm size. The major constraints of the beneficiaries were loan access, high interest rate, collateral, low level of awareness, loan rationing, repayment rate, loan default and high level of illiteracy. The beneficiaries should be encouraged to subscribe to membership of cooperative society. This will enable them to easily access micro finance loan because most of these groups dispense loan to their needy members. Loan acquisition procedure by agricultural bank credit should be made easier as well as the threshold of farmers financial management ability should be considered during disbursement of loan to farmers for effective utilization**.**

References

Abdallah, A. (2016). Agricultural credit and technical efficiency in Ghana: is there a nexus? *Agricultural Finance Review*, 76(2),309-324.

Abdullah, A.l.M., Muniady, R., Yukthamarani, P.P., Zainol, N.R.B., Mohamad, M.R (2016). Micro-enterprise development initiatives and entrepreneurial competencies, innovativeness, and social capital in Malaysia. *Development in Practice*, 26(8),1094-1110.

Adegbite, D. A., Adeleye, O. A. (2011). Determinants of farmers' access to micro-loan in Oyo State, Nigeria. Journal of Agricultural Research and Development, 10 (1)

Agbo, F. U., Iroh, I. I., Ihemezie, E. J. (2015). Access to loan by vegetable farmers in Nigeria: A case study of Owerri agricultural zone of Imo State, Nigeria. *Asian Journal of Agricultural Research*, 9, 155-165.

Akinwale, J.A., Ladele, A.A., Olajide, B.R. (2016). Yield differentials among participating and non-participating rice farmers in public/private partnership in Benue and Ogun States, Nigeria..*Agrosearch* 16(1),23-37.

Akudugu, M. A (2016). Agricultural productivity, credit and farm size nexus in Africa: A case study of Ghana, *Agricultural Finance Review*, 76 (2),288-308.

Akudugu, M. A. (2012). Estimation of the determinants of credit demand by farmers and supply by rural banks in Ghana's Upper East Region. *Asian Journal of Agriculture and Rural Development*, 2(2), 189.

Akudugu, M. A., Guo, E., Dadzie, S. K. (2012). Adoption of modern agricultural production technologies by farm households in Ghana: What factors influence their decisions?

Ani, I.I. (2014). Impact of national fadama II development project on agricultural productivity in Federal Capital Territory, Abuja. Unpublished post field seminar M.Sc. Thesis presented to the Department of Agricultural Extension and Communication University of Agriculture, Makurdi. p67.

Asogwa, B.C., Abu, O., Ocheche, G.E. (2014). Analysis of peasant farmers access to agricultural loan in Benue State, Nigeria. *British Journal of Economics, Management and Trade*. 4(10), 1525-1543.

Beck, T. (2007). Financing Constraints of SME's in developing Countries. Evidence, determinants solutions. *Journal of International Money and Finance* 31(2): 401-441.

Currie, L. (2018). The big push and balanced and unbalanced growth. Institutional Economics Magazine. *Rev.econ.inst.vol.20 no.39 Bogotá July / Dec.2018.* http://dx.doi.org/10.18601/01245996.v20n39.04.

D'Espallier B., M. Hudon, Szafarz. A. (2016). Aid volatility and social performance in microfinance. *Nonprofit and Voluntary Sector Quarterly*, 46 (1),116-140.

Edet G.E., Etim Nsikak-Abasi. A. (2017). Credit Accessibility to Poor Rural Farmers: A Logistic Regression Approach. *American Journal of Business, Economics and Management*. 5(3):18-24.

Elias, S., Ahmad, I.M., Paul, B.L (2015). Determinants of access to agricultural loan for small and marginal farmers in Nigeria: A case study of Owerri agricultural zone of Imo State, Nigeria. Asian Journal of Agricultural Research, 9,155-165.

FAO. (2016). Nigeria at a Glance. Available at www.fao.org/nigeria-at-a-glance/en (Accessed on 01July 2016). http://www.ajol.info/index.php/jard/article/view/74029.

Gbigbi, T.M. (2021). Technical efficiency and profitability of cassava production in Delta State: A stochastic frontier production function analysis. *Journal of Tekirdag Agricultural Faculty,*18(1),21-31.

Gbigbi TM. 2020. Impact of multinational oil firms' corporate social responsibility on agricultural development in host communities in Nigeria. *Black Sea Journal of Agriculture*, 3(2): 146-154

Ibitoye, S.J.(2010). The influence of farm size, educational status and farm income on adoption of maize varieties in Kogi State, Nigeria. American-Euro Asian Journal of Sustainable Agriculture 4(1),20-25.

Lu, W.C., Hassan, M.A. (2011). Effect of microloan programme on rural poverty alleviation: An empirical study of four major microloan organization at Monirampur Upazila in Bangladesh. *African Journal of Agricultural Research*, 6(26), 5742-5746.

Mgbenka, R.N., Mbah, E.N. (2016). A review of smallholder farming in Nigeria: Need for transformation. *International Journal of Agricultural Extension and Rural Development Studies*, 3(2):43-54.

Nouman, M., Siddiqi, M. F., Asim, S. M., Hussain, Z. (2013). Impact of socio-economic characteristics of farmers on access to agricultural credit. *Sarhad Journal of Agriculture*, 29(3), 469-476

Okojie, C., Monye-Emina, A., Eghafona, K., Osaghae, G., Ehiakhamen, J.O. (2010): Institutional environment and access to microfinance by self-employed women in the rural areas of Edo State. NSSP Brief No.14. International Food Policy Research Institute: Washington. D.C.

Ololade, R. A. and Olagunju, F. I. (2013). Determinants of access to loan among rural farmers in Oyo State, Nigeria. *Global Journal of Science Frontier Research Agriculture and Veterinary Sciences*, 13(2), 16-22.

Sadiq, M.M., Kolo, M.D., Akerele, F.O. (2015). Determinants of loan constraints of farming households participating in National Special Programme for Food Security (NSPFS) in Niger State, Nigeria. *Global Journal of Agricultural Economics and Econometrics*, 3(1), 114-120.

Sarker, M. N. I. (2016.). Role of banks on agricultural development in Bangladesh. *International Journal of Ecology and Development Research*, 1(1), 010-015.

Semerci, A., Celik, A.D.(2017).Reflections of Animal Husbandry Subsidies on Dairy Cattle Enterprises: A Case Study of Hatay Province-Turkey. *Journal of Tekirdag Agricultural Faculty*,14(2),92-100.

Sofayo, S. A. (2017). Credit risk management techniques and loan portfolio quality of Nigerian commercial banks (2006-2015). A Ph.D thesis submitted in the department of business administration and marketing Babcock business school Babcock University Ilishan-Remo Ogun State Nigeria.

Yehuala, S.(2008). Determinants of smallholder farmers access to formal credit: The case of Metema Woreda, North Gondar, Ethiopia (Unpublished master's thesis). Haramaya University, Ethiopia