

Impact of Credit Use on Resource Productivity of Sweet Potatoes Farmers in Osun-State, Nigeria

F. I. Olagunju

*Department of Agricultural Economics and Extension, Ladoke Akintola
University of Technology P.M.B 4000, Ogbomoso, Nigeria
E- mail: olagfunk@yahoo.com*

KEYWORDS Sweet potatoes; credit use; impact; productivity; marginal value product

ABSTRACT In the face of excruciating poverty in the rural economy where in farmers are major players, credit is necessary for capital formation, diversified agricultural production and efficiency in agricultural resource-use. This paper thus examines the credit-linked differences in production knowledge among sweet potatoes farmers in Osun-State. The objectives relates to socio-economic differences and resource use efficiency between farmers producing with credit and farmers producing without credit. In this while, the study was able to access the impact of credit on the resource productivity of the sweet potatoes farmers. A sample of 140 farmers comprising 60 that used credit and 80 that did not was randomly selected for detailed study. Primary data obtained from them were analyzed by Marginal Value Product and Multiple Regression Technique. Results indicated that farmers that produced with credit use resources efficiently than those without credit.

INTRODUCTION

Agricultural credit has long been identified as a major input in the development of the agricultural sector in Nigeria.

According to Shepherd (1979) credit determines access to all of the resources on which farmers depend. Consequently, provision of macroeconomic policies and enabling institutional finance for agricultural development has been directed to the provision of infrastructure capable of facilitating agricultural development with a view to enhancing the contribution of the sector in the generation of employment, income and foreign exchange (Olomola, 1997).

One of the reasons for the decline in the contribution of agriculture to the economy is lack of a formal national credit policy and paucity of credit institutions, which can assist farmers. Credit or loanable funds is viewed as more than just another resource such as labour, land, equipment and raw materials (Rahji, 2000).

Therefore, by injecting capital into agriculture, it is possible to increase the rate of agricultural development since credit has frequently been considered as one of the main factors in overcoming agricultural stagnation that helps to expand farmland size and production (Olagunju, 2000)

Oladunni, (1992) affirmed that credit facilities as well as the use of agricultural capital and labour resources accelerate adoption process and

expand the scale of production. He further ascertained that with the introduction of credit, the farmers would be able to make possible a better combination of resources that can be employed to facilitate an increase in resource productivity.

Therefore an increase in the food production would lead to an improvement in the welfare of the farmers and consequently a reduction in their poverty and food insecurity levels.

This study is based on the resource productivity of credit user and non credit user in respect of sweet potatoes crop farmers in Osun State, Nigeria. Resource productivity refers to the abilities of the farmers to put their resources into best use that will increase yield which will in turn boost the returns. Hence the study examines the socio-economic difference between the two groups and also evaluates the resources use efficiency between them.

METHODOLOGY

The study was conducted in Osun State of Nigeria. A multistage sampling technique was used. A sample of five (5) Osun State Agricultural Development Programme (ADP) zones was purposively chosen so as to concentrate on the sweet potato farmers. The listing of the sweet potato farmers in the chosen zone was done with the assistance of the OSADEP Staffs. The questions posed enable the compilation of two

lists for each study location that is sweet potato farmers that use credit and those that did not. These lists formed the frames from which separates samples of 60 credit using farmers and 80 non credit using farmers were chosen, by a simple random sampling technique. Cross-sectional data were collected from these samples in 2003/2004 cropping season.

Frequency distribution and percentages were used to examine the socio-economic characteristics of the two groups while double log, semi-log and linear production functions were fitted to evaluate and compare resource use efficiency between the two groups. The marginal value product (MVP) of inputs derived from the production models were compared with their respective acquisition costs.

Multiple regression technique was employed to investigate the relationship between sweet potatoes and various inputs used in its production.

The function can be explicitly stated as

$$Y = f(X_1, X_2, \dots, X_7)$$

Where

Y = Output (N)

X_1 = Farm size (ha)

X_2 = Education (years)

X_3 = Age (years)

X_4 = Labour (man-day)

X_5 = Fertilizer (Kg)

X_6 = Planting materials like vine cuttings, agrochemicals (N)

X_7 = Fixed Cost or capital (N) including capital services from farm implements and tools, machinery, depreciation and interests charges,

repairs and other operating expenses.

A separate production function was fitted to each category of farmers as well as pooled data.

Different forms of production such as linear, Semi-Log and double log (Cobb-Douglas) were tried and the final choice of production function for economic analysis was based on conventional economic statistical and econometric criteria (Koutsoyiannis, 1981).

RESULTS AND DISCUSSION

The means and the standard deviations of the socio-economic characteristics of the two groups of respondents were summarized by Table 1. Considering the sweet potato output, on the average, the value was smaller for farmers without credit than for those with credit. The difference between the outputs is not significant at 5% probability level; this may be due to the fact that farmers without credit make use of smaller physical inputs than their counterparts. For instance, they used less of hired labour (X_4), fertilizer (X_5) and less likely to use factor service (X_1) due to small area of land cultivated. This can be confirmed from Table 2 with 20% of farmers with no credit having no access to tractor and 50% of those farmers with credit having access to tractor use.

The results of the estimated model was summarized and presented in Table 3. Results from the linear production function is selected as the lead equation based on (i) the magnitude

Table 1: Mean value and standard deviation of socio-economic characteristics of the respondents.

Variables	Description	Farmers Producing with credit	Farmers without credit	Pooled data
Y	Sweet potatoes output	₦58,754.56 (34432.13)	₦43,652.03 (39562.51)	₦51,203.30 (36997.32)
X1	Land area (ha)	2.84 (0.82)	1.01 (0.98)	1.93 (0.9)
X2	Education (years)	8.56 (2.01)	5.69 (3.88)	7.13 (2.95)
X3	Age (years)	40.36 (7.86)	44.3 (8.23)	42.33 (8.05)
X4	Labour (man-day)	19.23 (4.82)	18.16 (5.12)	18.7 (4.97)
X5	Fertilizer (Kg)	765 (352.6)	376.4 (466.45)	570.7 (-580.3)
X6	Planting material (N)	₦6,275.00 (46.2)	₦6,315.00 (46.8)	₦6,295.00 (46.5)
X7	Capital (N)	₦3,256.10 (38.1)	₦4,357.70 (40.56)	₦3,806.90 (39.33)

Source: Data Analysis, 2005
Standard Errors are in brackets.

Table 2: Distribution of respondents by tractor service.

Description	Farmers with credit	Farmers without credit	Pooled
Tractor Use	50%	20%	35%

Source: Field survey, 2005

of R (ii) the significance of F-value (iii) the t-values and (iv) the appropriateness of the signs of the regression coefficients. The F-ratio value is statistically significant at 1 percent for the pooled data which implies that the model is adequate for use in further analysis.

The coefficients of determination (R^2 was 67.87% for the pooled data, 78.56 for farmers with credit and 63.87% for farmers without credit). This implies that the independent variables explain at least 68% of the variability in sweet potatoes output in the study area.

For the pooled data, farm size (X_1), labour (X_2) and planting materials (X_6) are positively and significantly related to sweet potatoes output.

The results for the farmers without credit are poor; this could be an indication of inefficient use of the available resource and inability to acquire additional capital for expansion. The results obtained for the farmers with credit indicated that they are resourcefully efficient than their counterparts producing without credit. This result is expected (Desai and Mellor, 1993) and points to the positive impact of credit on sweet potatoes production. The coefficients for hired labour and planting materials are statistically significant at 1% for farmers with credit and at 10% for farmers without credit. The coefficient for hired labour is positively signed indicating a higher level of use intensity for this input for the farmers that used credit. An alternative strategy for enhancing efficiency of these farmers would be through an efficient credit use. The negative sign for the coefficient of planting materials

Table 3: Estimated production function

Variable	Pooled n = 140	Farmers with credit n=60	Farmers without credit n = 80
Constant	18,205.72	14,292.75	37,481.32
X1	16341.75*** (5.32)	17923.14*** (5.21)	5521.85 (0.42)
X2	467.38 (0.72)	863.21 (0.92)	854.32 (0.83)
X3	659.19 (1.36)	2122.72 (2.01)	463.42 (0.57)
X4	1576.36*** (3.67)	1756.18*** (2.18)	1275.41* (0.98)
X5	10.17 (1.81)	28.15** (2.06)	11.26 (1.96)
X6	0.41*** (3.57)	0.31*** (3.46)	-0.27* (-1.87)
X7	0.43 (1.34)	0.22 (1.04)	-0.09 (-0.57)
R2	67.87%	78.56%	63.87%
R-2	52.80%	63.21%	42.71%
F-ratio	6.78%***	7.81%***	4.20%***

Source: Computed from field data, 2005

*** Sig. At 1%

** Sig. At 5%

* Sig. At 10%

Values in the bracket are the t-values

suggests that the farmers without credit have a lower level of use intensity for this input. Since this variable is measured in monetary terms, it implies that credit use enables the farmers to have access to better production technologies, which results to lowering of the costs associated with the use of planting materials such as vine cuttings and agro chemicals.

The coefficient of fertilizer (X_5) is significant at 5% for farmers with credit and also positively related with the output, this therefore indicates an efficient use of the resource by the farmers.

The marginal productivity of farm size (X_1), labour (X_2), fertilizer (X_3), planting materials (X_4) and capital (X_5) were estimated with each of their cost. This is presented in Table 4.

Considering the pooled sample, the marginal

Table 4: Marginal value productivity and economic efficiency.

Variable	Pooled Data			Farmers with credit			Farmers without credit		
	MVP	Factor cost ₦	Efficiency ratio	MVP	Factor cost ₦	Efficiency ratio	MVP	Factor cost	Efficiency ratio
X_1	1834731	-	-	19241.8	-	-	17136.8	-	-
X_2	1857.12	700	2.65	12.08	700	1.39	648.13	700	0.93
X_3	18.5	12	1.54	975.34	12	1.01	9.95	12	0.83
X_4	6634.41	6300	1.05	7535.32	6200	1.22	5423.42	6400	0.85
X_5	4347.3	3800	1.14	3467.61	3300	1.05	2876.36	4400	0.65

Source: Computed from field survey, 2005.

productivity of land was the highest. The values are greater among farmers with credit than farmers without credit. The high value of land may be explained by the increasing productivity of sweet potatoes vine in the area, which results from easy availability of improved cultivars. However, the MVP of land cannot be compared with its acquisition value because land is neither sold nor rented in the area. Farmers are given automatic permission for the use of land (in most case) so long it is not being cultivated by the owner.

The MVP of labour is much higher than the average wage rate for pooled data and farmers with credit while it was lower than the average wage rate for the farmers without credit. The later result tends to conform with the common assumption of very low productivity of labour in traditional agriculture. Since the MVP of hired labour is much higher for the former results, it is therefore suggested that the family labour should be valued below the market wage rate.

The marginal productivity of fertilizer, planting materials and capital were positive for all data categories. The resource-use efficiency ration of fertilizer and capital are approximately unity for farmers with credit use suggesting an optimal use of these resources. The positive but less than unity MVP of fertilizer, planting materials, labour and then capital indicate under-utilization of the resources thereby resulting in lower output for farmers without credit. Hence, to increase efficiently, more resources should be obtained by getting more funds or credit.

CONCLUSION

The farmers without credit are under-utilizing labour input, fertilizers, capitals and planting materials devoted to sweet potatoes production

relative to their counterparts that produce with credit.

Sweet potatoes farmers that produced with credit were found to be resourcefully more efficient than their counterparts that produced without credit. Moreover, they have higher use intensities for hired labour and lesser for planting materials. These indicate the potency of credit in optimal reallocation of farm resources for efficient use.

The use of credit facilities would therefore translate to higher resource employment and capacity utilization, increased output and income, and reduce poverty in the rural economy, especially among the farmers.

Based on this study, it is therefore recommended that economic policies that will ensure provision of credit to the farmers in the study area should be put in place.

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