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EVALUATING DEMAND SIDE FACTORS THAT AFFECT INSTITUTIONAL CREDIT USE AND PROFITABILITY OF SMALL- SCALE GROWERS OF ROOTS AND TUBERS: EVIDENCE FROM CAMEROON'S SOUTH WEST REGION

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Abstract

In this study, demand-side variables affecting the use of institutional finance with small-scale growers of roots and tubers profitability in Cameroon's southwest are investigated. Using a multi-step stratified and straightforward random sample process, 837 respondents were chosen. In study was found that as farm size grows, so

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does the likelihood of loan need. A farmer with more years of farming expertise has more opportunities to use and demand finance. Credit institutions are more willing to lend to couples because they believe they will be able to repay the loans collectively. Educated farmers are certain that using borrowing to grow their investment will yield output that will cover their loan repayments due to their knowledge of production processes and record keeping. Further, the profitability of institutional credit users for cassava, cocoyam, and yam was higher than that of non-users of institutional credit. New techniques for identifying financially disadvantaged rural poor in the Region should be created by focusing on metrics that would increase the efficiency of entrepreneurs and take them closer to the production frontier. One of these solutions may be for the government to encourage microfinance institutions to lend to businesses in the form of inputs rather than cash.

Key words: demand side, institution, credit use, root and tuber, small scale, profitability.

JEL¹⁰: Q1, Q12, R15

Introduction

Several studies have found that financial constraints have a significant negative influence on farm output, farm investment, and profit in rural areas where farmers live (Ali, Awade, 2019; Wang et al., 2019; Amanullah et al., 2019; Lakhan et al., 2020; Balana, Oyeyemi, 2022). The majority of the aforementioned research failed to provide conclusive evidence as to whether financing restrictions were caused by demand-side issues or not. As a result, in study was filled a research vacuum by examining demand-side factors that influence small-scale root and tuber crop farmers' usage of institutional finance and profitability in Cameroon's South West region by hypothesizing that the profitability of loan users is likely to be greater than the non-users.

Study sought to understand how small-scale farmers use credit and the variations in the profitability of users and non-users of credit institutions. Mentioned provides a holistic picture of existing demand-side barriers to institutional credit use. Moreover, it would also provide information (numerical estimates) on the profitability level of institutional credit users and non-users in developing countries. The findings could provide insight into the actions required to enhance the creation and application of institutional credit. It will ultimately have an impact on how policies relating to efficient and sustainable financing systems are developed and put into practice. It can also assist in finding and analyzing fresh strategies for fostering creativity and also,

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provide answers to marginal questions on how institutional credit applications could make farm businesses become more viable units in terms of profitability.

The loan is necessary as it facilitates investment and can thereby increase farmers' income and savings (Twumasi et al., 2020). Loan enhances the adoption and use of new technologies, improves productive activities, and poverty alleviation, and boosts the farmers 'quality of life (Nguyen et al., 2021; Vu, Ho, 2022). The production of agricultural goods is significantly impacted by the input-output relationship over a long period (Conning, Udry, 2005). Due to this, it is challenging for rural farmers to balance their budgets during periods of excessive spending and low revenues. Fiscal balances can reduce agricultural productivity year-round when funding is limited. Once farmers are limited in their cash flow, the number of input combinations they use may deviate from ideal levels, reducing the optimal output of consumer goods (Conning, Udry, 2005). As a result, credit's marginal contribution raises yield and output by bringing input levels closer to optimal values (Bertrand, Teuwa Nkeuwo, 2011). Following Tchouassi (2011), credit enables rural farmers to make investments and end the "vicious cycle" of impoverishment. The credit increases the income and reserves of farmers, resulting in increased investment and reinforcing high incomes. Due to stringent requirements for rural credit and lending restrictions, profit-seeking financial institutions face high operating expenses (like those related to verification, and oversight, as well as a significant financial crisis (such as those linked with jeopardy, lack of guarantee assets, or client income stability), and low profit as a result of interest rate caps set by the government (Bertrand, Teuwa Nkeuwo, 2011).

The unofficial financial lending organization, also known as "njangi" in broking language and "tontines" in French, is the most fundamental type of credit institution in Cameroon. These rotating savings organizations proliferate against the backdrop of a mostly broken banking system. They are established whenever there is an excessive demand for credit in the formal market as a result of transactional and price ceiling quantitative limitations. According to Sica and Strasser (2001), there are two different kinds of informal financial systems. The first predetermine the sequence in which participants receive funds by agreement. The second determines, by agreement, the sequence in which participants get an advance payment. The number of adherents determines the credit period and this affects the length of the credit cycle. The same amount will be shared once-a-month deprived of interest. All current round adherents who have not yet received credit are eligible to tender on the funds raised in the second round. Funds will be shared with the highest bidder. Profits from the main market are divided into small lots and sold on the secondary market. These cash funds are classified as short-term credit and must be repaid with interest on the secondary market.

The second form of revolving financial savings institution is extra flexible, allowing individuals at all income levels to join. Individual members of a lending stock have the same access to the money collected as a joint fund. Fresh donations are divided into money packages based on the number of participants and the number of loans they request at each step. In the majority of circumstances, an arbitration body is available to meet everyone's needs. The typical loan period in this situation is one month, with interest rates ranging from 5 to 10% monthly. To alleviate resource poverty among rural farmers in Cameroon, agricultural credit has become a key resource in agricultural output. Institutional and non-institutional schemes have been formed, but their effectiveness in meeting the credit needs and outcomes of food crop producers has remained a point of contention (Amin et al., 1999).

Faced with the constraints that small-scale root and tuber crop farmers face, Cameroon's government has developed several initiatives to help them cope with their activities, including a rural credit scheme that has provided credit to rural populations over time, and a loan agreement for the growth of the root-and-tuber industry through a program for public development of the subsector which has a total budgetary allocation of 22 million USD, as a component of the nation's overall development plan (Dufour, 2013). By promoting the roots and tubers (R&T) subsector, the National Development Programme for Roots and Tuber (PNDRT) intends to improve the food security and livelihoods of rural people, particularly vulnerable populations such as women and young people, as advised by International Fund for Agricultural Development (IFAD, 2011). The struggle to secure credit continues, and efforts to boost earnings and close the income gap in rural settlements appear to be only partially successful. Some of this resourcefulness may have been developed by the government in response to rural residents' requests for low-cost financing for rural occupational activities since they are unable to coordinate self-help efforts. Traditional rural market operators have not been forced out of the market despite government involvement in the development of alternative credit institutions. Finance remains a limiting issue in expanding agricultural production, despite these efforts to enhance lending markets.

The findings showed that as farm size increases, the demand for loans increases too. A farmer with more years of farming expertise has more opportunities to use and demand finance. Credit institutions are more willing to lend to couples because they believe they will be able to repay the loans collectively. Educated farmers are certain that using credit will boost their investment which will yield output that will cover their loan repayments following their knowledge of production processes and record keeping. Further, the profitability of institutional credit users involved in cassava, cocoyam, and yam production was higher than the profitability reached

by the non-users of institutional credits. The findings of survey corroborate that the role played by financial institutions cannot be overemphasized in the productivity of small-scale growers of roots and tubers.

Literature Review

Definition of credit

The definitions of “credit” have changed over time. Some people refer to it as a “loan,” while others use the term “borrow” for qualified credit. According to Ntsama (2000), credit is a loanable fund that enables people to buy products, services, or both now and promise to pay for them later. The implication is that credit can be used to temporarily transfer assets or the usage of such assets from a person or an organization that has them to a person or an organization that does not. However, Meyer et al. (2004) clearly distinguished between a loan and a credit. For as long as he hasn’t used his credit “asset” by trading it for a loan, the farmers can use it as an asset or financial reserve when they need it. In addition to beginning to pay interest when a farmer switches from credit to a loan, he also uses up a portion of his capacity and, as a result, a portion of his future borrowing power. According to Khalid (2013), credit is the “monetary” or money facet of capital resources, which are typically characterized as things that are used but not essentially consumed throughout the production stages. Credit is the process of getting control over the use of money, products, and services in exchange for the promise to repay at a later time, according to Adegeye and Dittoh (2000). A loan is often exchanged for some form of proof of debt obligation, except for transactions involving friends or family members where loans are issued entirely based on the borrowers’ good credit and financial standing. Mortgages on land, buildings and pledges of trees or food crops can all serve as evidence (Konings, Walsh, 1999). Credit is a tool used to facilitate the temporary transfer of purchasing power from one person or organization to another (Meyer et al., 2004). Credits serve as the foundation for function-specific specialization, which increases output and efficiency.

Factors that influence farmers’ use of institutional credit

Khalid (2013) and Kumar et al. (2007) assessed credit utilization by small-scale farmers in Zanzibar and Bosnia and Herzegovina respectively. Their results show that age, sex, marital status, capital, revenue, and degree of credit awareness are variables that impact the access to and utilization of credit. Tang and associates (2010) found that farm holding and age are factors that significantly influence the demand for credit. Sekyi and associates (2017) found that age is negatively related to credit constraints. Chandio and Jiang (2018) have been discovered that factors such as time

lag, lending procedures, distance to loan sources, and interest rates influence loan accessibility. Asiamah and associates (2021) found that marital status and education significantly influence the demand for loans. Though, some lenders' lending limits and requirements must be followed for borrowers to receive a loan. When borrowers feel that these criteria are unsuitable, they either decide not to apply for loans or learn that their application has been denied. Due to the lack of tangible collateral and processing costs associated with institutional lending, formal institutions prevent landless individuals from accessing loans (FAO, 2009). Fall (2008) found that the majority of small and medium-sized businesses rarely borrow money from financial institutions. Their inability to save much money and the meager returns on their little farming investments cause them to suffer. Furthermore, the likelihood that farmers will get finance is decreased by bureaucracy, a lack of collateral, a short payback period, a failure to adopt new technology, and a lack of expertise in loan utilization (Ibiang et al., 2012). According to Koloma (2010), factors that affect credit utilization on the supply side include high transaction costs and administrative bottlenecks in credit applications, insufficient credit information, strict bank requirements, the location of lending institutions, and bureaucratic procedures in banks that result in late disbursement of loan facilities to farmers. Some loans, however, are limited available to specific economic sectors, e.g., in poor nations, only a small number of formal institutions are ready to finance agriculture. Fouillet and Augburg (2007) listed the variables that affected credit outreach and noted that a wide range of variables has been mentioned in the literature as having an impact on microfinance outreach. The variables include demand-side variables that mostly fit assets, age, occupation, education, and health. The supply-side variables that affect credit costs include things like the distance to the closest institution, interest rate, etc. Mpuga (2004) divided demand-side factors influencing access to financial facilities into two categories: characteristics of individuals or families, and characteristics of financial institutions. Individual traits include age, education, marital status, sex, income, etc. (Silong, Gadanakis, 2020).

Study Procedure

Area of research study

Research was conducted in the South West part of Cameroon. With a population of 1,316,079 and a land area of 25,410 km². The South West Region is one of the ten regions that make up the Republic of Cameroon (Fogwe, 2014). The South West Region lies between the Equator's latitudes of 4 and 6 degrees north and the Greenwich Meridian's longitudes of 8 and 10 degrees east. The North West Region hems in the South West Region to the north, the West and Littoral Regions to the

east, the Atlantic Ocean to the south, and Nigeria to the east. Fako, Meme, Kupé-Muanenguba, Manyu, Lebalem, and Ndian are the six divisions that constitute the region. There are at least five sub-divisions within each of mentioned divisions (Fogwe, 2014).

Sample population

All listed smallholder root/tuber crop growers in the area of study were included in the study. According to the Regional Delegation of Agriculture, there are 2,845 smallholder root/tuber growers registered. As collecting data from the overall smallholder root/tuber growers would be impractical and expensive, the study used a sample of the smallholder root/tuber growers who used institutional credit during the fiscal year 2019-2020 and were classified into two groups: users and non-users.

Sample dimensions and sampling techniques

For sample selection, a stratified, multi-stage random sampling procedure was adopted. Firstly, three Divisions were chosen at random from among the six Divisions. Secondly, two Subdivisions from each of the three Divisions that were previously selected were observed, in total six Subdivisions. A Council area was purposefully chosen from each of the Subdivisions in the third stage. This was done to guarantee that the council districts chosen have at least one financial institution. Finally, from each council area, respondents were selected after stratifying them purposively into three root/tuber crop types (cocoyam, cassava, and yam farmers). The three crops purposively selected constitute the three most important staple root/tuber crops in the study area in terms of income, production, and contribution to food security (FAOSTAT, 2012). The pattern sizes of the diverse strata have been received through randomization to get the respondents for the diverse strata using Djoumessi et al. (2018) and Obianefo et al. (2020) to reap the pattern length of the study.

A list of all registered small-scale farmers growing yams, cocoyam, or other root crops for the market was used to choose the sample (those who used credit and those who did not use the credit), previously obtained from the Regional and Sub Divisional delegations of the locality. The list of required information relates to the name of the farmer, community name, amount of used loan, and time of taking the loan.

The study's sample size was determined following Djoumessi et al. (2018). It was used from a sample frame of 1,193; 916; and 736 registered Cassava, Cocoyam, and Yam farmers respectively. It is expressed as follows:

$$n = \frac{N}{1+Ne^2}$$

Where:

n = samples taken.

N = population.

e = confidence interval (5% or 0.05).

1 = constant.

Table 1. Sample size selection plan (margin of error 5%)

Division	Sub Division	Council/ Town	Crops			Overall sample size
			Cassava	Cocoyam	Yam	
Fako	Muyuka	Ekona	329	228	209	
	Limbe	Mabeta	191	198	71	
	Manyu	Mamfe	161	168	105	
	Eyumojoock	Ekok	183	105	138	
	Ndian	Ekondo titi	228	138	86	
		Mundemba	101	79	127	
Total Sample Frame spread per crop			1,193	916	736	
Total sample size per crop			300	278	259	837
Users			119	87	117	323
Non-Users			181	191	142	514

Source: Djomo et al., 2021.

The sample size therefore comprised a selection of 837 farmers engaged in farm activities, producing either cocoyam, cassava, or yam for the market (Table 1.). Out of all who used financial facilities for agricultural output, there were 323 growers available (producing food crops – cassava, yam, and cocoyam) during the fiscal year 2020-2021, while 514 producers represent those who did not use financial facilities. They were selected purposively based on the availability of a list of registered credit users and non-users while keeping the homogeneity of the sample. From the mentioned list, producers who did not use financial facilities were selected from the vicinity of the producers using financial facilities and having similar socioeconomic traits based on their environmental settings (income levels, total wealth, access to education and health facilities, cultural values and farming practices), as the financial facilities users. Choice was made to make the sample units more homogeneous in terms of socioeconomic traits and to lessen the likelihood of inclusion of outlier observations.

Method of Data Collection

A systematic questionnaire and interview approach were used to collect primary data. Questionnaires and interviews were applied to previously selected 837 producers from the study area. The used survey tool was divided into sections based on the required information. The questionnaire was given to the respondents by trained enumerators, while some of them are active as extension agents.

Data Analysis Techniques

To accomplish the study's aims, descriptive and inferential statistical analyses under obtained data were performed. The demand side variables affecting institutional credit use and profitability were particularly assessed using a binary regression model and a gross margin analysis, respectively.

Theoretical Framework and Estimation Technique

The binary logistic regression model

The drivers of institutional credit use were examined using a random utility framework as a binary dependent variable with jointly exclusive and thorough results. Let us consider the institutional credit use (ICU) model by assuming that ICU is dichotomous where institutional credit will be used when the net benefits of using the credit are higher than not using it. Suppose the difference between the net benefits of using and not using institutional credit (IC) is symbolized by $I^* I^* > 0$ indicating that the net benefits of IC use exceed that of IC non-use. Although I^* is unobserved, it can be formulated as a function of some observed characteristics in the following latent variable models:

$$\begin{aligned}
 I_i^* &= \beta X + u_i \\
 I_i &= 1[I_i^* > 0] \\
 f(u_i) &= \frac{\exp(-u_i^2)}{[1 + \exp(-u_i)]^2}
 \end{aligned} \tag{1}$$

Where,

X = Vector of observed characteristics: x_{1i} = age, x_{2i} = size of the household; x_{3i} = education, x_{4i} = farm size; x_{6i} = extension services, x_{7i} = farming experience (in years); x_{8i} = Gender (Dummy: 1 - male, 0 - female), x_{9i} = membership in farmers' cooperative/association (Dummy: 1 - member, 0 - otherwise), x_{10i} = professional

training (Dummy: 1 - yes, 0 - otherwise); I_i = use of IC (1 = yes, 0 = no); $f(u_i)$ = standard logistic distribution; \exp = exponential operator; β = vector of parameters to be estimated; u_i = statistical error term assumed to be logistically distributed. The probability of a household using IC can be expressed as:

$$\Pi_i = P(y_i = 1 | X) = \Lambda(\beta X) \quad (2)$$

Where,

$P(y_i = 1 | X)$ = conditional probability that the i^{th} household uses IC, while $\Lambda(\beta X)$ = logistic cumulative density function (CDF). Previous model could be later estimated by probit, supposing that the error term in (1) follows a logistic distribution, (2) can be estimated using a logistic regression model. Logistic regression model can be written towards the log of the odds (odds are generally determined as the probability of using IC divided by the probability of not using) as:

$$\ln(\Pi_i / 1 - \Pi_i) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_{10} x_{10i} + \varepsilon_i \quad (3)$$

Following equation (4), the logit can be defined as the natural logarithm of the odds with the range of values at the left-hand side of equation (4) between $-\infty$ and $+\infty$. Alternatively, equation (4) can be specified in terms of the odds of using IC as:

$$P(y_i = 1) / P(y_i = 0) = \Pi_i / 1 - \Pi_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_{10} x_{10i} + \varepsilon_i \quad (4)$$

Note that the range of values on the right-hand side of (5) can assume to lie between 0 and ∞ . Rearranging (5), the underlying probability of a successful outcome is deriving from:

$$\Pi_i = \exp(\beta_0 + \beta_1 x_{1i} + \dots + \beta_{10} x_{10i} + \varepsilon_i) / [1 - \exp(\beta_0 + \beta_1 x_{1i} + \dots + \beta_{10} x_{10i} + \varepsilon_i)] \quad (5)$$

Equations (3) – (5) are the same. For practical purposes, however, equations (3) and (5) are typically computed because they give both the likelihood of success and the estimates. However, it is interesting to note that the parameters in models (3) through (5) cannot be estimated using ordinary least squares since the probability to use IC is unknown. But by using the maximum likelihood estimator (MLE), the parameters can be estimated consistently. According to Greene and Hensher (2009), the log-likelihood function of the logistic distribution can be stated as:

$$\ln(\beta | X, y) = \sum_{i=1}^n (1 - y_i) \ln[1 - \Lambda(\beta' X)] + y_i \ln \Lambda(\beta' X) \quad (6)$$

It is also common in the literature to interpret the logit model using the marginal effect of the regressors on the probability to observe a positive outcome. But considerations should also be given on whether the regressors are discrete or continuous. For continuous and discrete regressors, the marginal effect was estimated here as:

$$\partial E(y_i|X)/\partial x_i = \Lambda(\beta' X) [1 - \Lambda(\beta' X)] \beta \quad (7)$$

$$\partial E(y_i|X)/\partial x_i = [P(y_i = 1|\bar{X}_{(d)}, d_i = 1) - P(y_i = 1|\bar{X}_{(d)}, d_i = 0)] \quad (8)$$

Where,

$\bar{X}_{(d)}$ is the mean of all other variables in the model while d_i is a given dummy regressor. Greene and Hensher (2009) argued that "simply taking the derivative concerning binary variable, as if it were continuous provides an approximation that is often accurate".

A priori expectation: coefficients $\beta_1, \beta_3, \beta_4, \beta_7$, and β_{10} are expected to be positive, while $\beta_2, \beta_5, \beta_6, \beta_8$, and β_9 are expected to be negative

Gross margin

The gross margin was determined by deducting the costs derived from crops grown from the gross income gained for crop realization. Costs are associated with crop production operations, harvesting, and marketing. The gross margin could be expressed as:

$$GM = TR - TVC$$

Where:

$$TR = \Sigma P Q$$

$$TVC = \Sigma C X$$

P = Market Unit Price of output (agro-food product);

Q = Quantity of output;

C = Unit cost of the variable inputs;

X = Quantity of the variable inputs;

GM = Gross margin (FCFA/ha);

TR = Total revenue (FCFA/ha);

TVC = Total variable cost (FCFA/ha).

Results and Discussion

The Cox and Snell R square (coefficient of determination), (R^2) was 0.807, indicating that 80.7% variation in small-scale farmers' use of institutional credit is explained by variations in the selected regressor. It suggests that the model has the power to change small-scale farmers' use of institutional credit. The Nagelkerke R^2 (adjusted) also supports the claim with a value of 0.605 or 60.5%. Calculated result implies that the selected regressor explains the behavior of small-scale farmers' use of institutional credit at an 80.7% level of confidence. The classification table (Table 2.) indicates that on average there was 91.1% of the appropriateness of the selected model.

Findings also demonstrate that, at the 5% level of probability, farm size significantly and favorably influences whether small-scale farmers in the study area employ institutional loans. The findings suggest that as the size of the operation of the farm increases, the chances of credit need increase 15.9 times, implying the need for a better source of credit facility which can meet the requirement of larger loan size increases, which makes farmers turn to institutional sources of credit. Gained outcome is in line with the presumption that more money will be needed to hire labor as farmers raise the scope of their operations, as in Ammani (2012) findings. With an "odd ratio" of 1.313, farm experience had a favorable and significant impact on farmers' likelihood of using institutional loans at the 5% level. Mentioned matches the a priori prediction. The conclusion is that a farmer has more opportunities to use credit the longer they have been farming. Additionally, the likelihood that a farmer will ask for credit increases by 1.3 times for every additional year of agricultural experience. Gained outcome is probably a result of the micro-entrepreneurs being more familiar with the essence of the business and the requirement for credit as their years of experience expand, which will promote business growth. Marriage has a favorable effect on credit consumption, according to the analysis of the marital status, while the effect was significant at the 5% level of probability with an "odd ratio" of 7.148. This indicates that having a married farmer increases the likelihood of financial facilities uses by 7.148 times. So, a married couple might jointly assume the risk of obtaining and utilizing credit with the expectation that they could repay it commonly. Besides, cause of this status, credit institutions are more comfortable extending credit to married couples. The observation is consistent with Asiamah et al. (2021) findings that marital status, household size, and gender all enhance the likelihood of accessing and using financial services.

Findings further indicate that farmers who had access to professional training had a favorable and statistically significant impact on how often they used institutional financing, at a 1% level of likelihood. The 'odd ratio' for education indicated 11.422,

meaning that educated farmers have higher chances (11.422) of using credit. Previous matches the a priori prediction implying that trained farmers could master production techniques and record keeping and are sure that the use of credit in expanding their investment must produce output that will carter for their loan repayments.

Gender, age, level of education, household size, extension services, and membership to group associations were variables that do not significantly influence farmers' choice to use institutional credit.

Table 2. Demand side factors influencing institutional credit use

Variables	Coefficient	S.E.	Wald	P-value	Odd ratio
Gender	-0.502	0.529	0.903	0.342	0.605
Age	-0.032	0.065	0.240	0.624	0.969
Education	0.498	0.425	1.374	0.241	1.645
Household size	0.161	0.191	0.705	0.401	1.174
Farming Experience	0.272	0.073	13.739	0.000*	1.313
Professional training	2.436	0.582	17.537	0.000*	11.422
Extension services	-1.560	0.599	6.783	0.210	0.210
Marital Status (single)	1.957	1.170	2.796	0.094	7.075
Marital Status (married)	1.967	0.680	8.361	0.004**	7.148
Farm size	5.023	0.790	40.445	0.00*	15.921
Membership in association	-0.890	0.578	2.376	0.123	0.410
Constant	-13.272	3.064	18.883	0.000	0.000
-2 loglikelihood	112.568				
Cox snell R ²	0.605				
Nagelkerke R ²	0.807				
χ^2	54.267			0.000	
Classification table	91.1				

Source: Djomo et al., 2021.

Note: * significant at 1% level, ** significant at 5% level.

Profitability of Institutional Credit Users and Non-users

Gross Margin Analysis per Hectare for Users and Non-users of credit

The next tables (Tables 3., 4. and 5.) are shown data linked to gross margin per hectare analyses for users and non-users of institutional credits for cassava, cocoyam, and yam production, respectively. Results show that small-scale cassava farmers who used institutional credit had a gross margin per hectare that ranges between 443,320 FCFA to 815,200 FCFA with a mean of 740,370 FCFA, while those who do not use the institutional credit had a gross margin per hectare that ranges between 238,125 FCFA to 644,905 FCFA with a mean of 422,785 FCFA. The profitability has been

increased if the achieved mean gross margin per hectare is compared to the value of 723,000 FCFA/ha, as found by Nchare (2007) in the analysis of the profitability of selected tuber crops in the Center Region of Cameroon. The difference could be explained by the time worth of money as well as by differences in the adaptability of crops in observed areas.

Findings also show that cocoyam farmers who used institutional credit had a gross margin per hectare that ranges between 295,100 FCFA to 667,565 FCFA with a mean of 563,510 FCFA, and those who did not use institutional credit having a gross margin per hectare that ranges between 149,540 FCFA to 466,540 FCFA with a mean of 236,580 FCFA.

For small-scale yam farmers who used institutional credit, the gross margin per hectare ranges between 1,174,280 FCFA to 2,453,575 FCFA with a mean of 2,144,970 FCFA, while those who did not use institutional credit had a gross margin per hectare that ranges between 500,405 FCFA to 1,600,030 FCFA with a mean of 969,485 FCFA.

The findings generally indicate that contrary to non/users, users of institutional credit for root/tuber crops production within the surveyed region had larger gross margins. Gained results are consistent with the results of Erhabor and Emokaro (2007), who found that in Nigeria, farmers who used loans fared better financially than those who didn't.

Table 3. Distribution of gross margin per hectare for users and non-users (cassava farmers) of institutional credit in the South West Region of Cameroon

Category	Total Revenue (FCFA*/ha)	Total-variable cost (FCFA/ha)	Gross Margin (FCFA/ha)
Users			
Mean	1,493,200	752,830	740,370
Maximum	1,918,600	1,103,400	815,200
Minimum	1,237,200	793,880	443,320
Non-Users			
Mean	1,068,375	645,590	422,785
Maximum	1,758,750	1,113,845	644,905
Minimum	623,330	385,205	238,125

Source: Djomo et al., 2021.

Note: * 1 USD = 570 FCFA (the average exchange rate in 2021).

Table 4. Distribution of gross margin per hectare for users and non-users (cocoyam farmers) of institutional credit in the South West Region of Cameroon

Category	Total Revenue (FCFA/ha)	Total-variable cost (FCFA/ha)	Gross Margin (FCFA/ha)
Users			
Mean	1,079,975	516,465	563,510
Maximum	1,859,745	1,192,180	667,565
Minimum	609,000	313,900	295,100
Non-Users			
Mean	491,610	255,030	236,580
Maximum	1,301,780	835,240	466,540
Minimum	253,000	103,460	149,540

Source: Djomo et al., 2021.

Table 5. Distribution of gross margin per hectare for users and non-users (yam farmers) of institutional credit in the South West Region of Cameroon

Category	Total Revenue (FCFA/ha)	Total-variable cost (FCFA/ha)	Gross Margin (FCFA/ha)
Users			
Mean	3,445,230	1,300,260	2,144,970
Maximum	4,371,175	1,917,600	2,453,575
Minimum	2,525,510	1,351,230	1,174,280
Non-Users			
Mean	2,054,015	1,084,530	969,485
Maximum	3,554,670	1,954,640	1,600,030
Minimum	1,132,810	632,405	500,405

Source: Djomo et al., 2021.

Conclusion and Recommendations

Despite the fact information provided by the farmers was based on memory recall, as they kept few or no proper records of their farming activities. The study used a total of 837 small-scale growers of root and tuber crops to assess the demand side parameters influencing institutional loan use and profitability for sustainable growth of small-scale root and tuber crop farms in South West Region of Cameroon. According to findings, farm size, training, marital status, and farming experience have significant and positive influences on the decision of farmers to demand institutional credit. The gross margin per hectare for both statuses related to credit use is positive, implying the indication that the farm activity could be profitable with or without credit use. It is therefore recommended:

- i) New methods for identifying the economically left-out countryside poor in the Region should be established by emphasizing factors that would increase farmers' productivity and bring them closer to the frontier of production.
- ii) Given that there is a serious issue of substitutability and diversion of credit, the government should encourage microfinance institutions to give loans in form of inputs rather than cash to farmers as a significant portion of the loan is used for unintended purposes.
- iii) To make it simple for farmers to receive credit, the majority of institutional sources of funding, such as financial institutions and Non-Governmental Organizations, should establish branches in the surveyed region. This might be accomplished by the government creating a supportive environment, such as loosening the requirements for opening commercial banks in rural areas and giving non-governmental groups a yearly payment to cover the expense of managing such loan programs in rural areas.
- iv) A similar study in a broader area could be carried out using panel data so that it will provide more insight into different levels of output about credit use over some time.

References

1. Adegeye, A., Dittoh, J. (2000). *Essentials of Agricultural Economics*. Impact Publishers Nigeria, Ibadan, Nigeria.
2. Ali, E., Awade, N. (2019). Credit constraints and soybean farmer's welfare in subsistence agriculture in Togo. *Heliyon*, 5(4):e01550
3. Ammani, A. (2012). An Investigation into the relationship between agricultural production and formal credit supply in Nigeria. *International Journal of Agriculture and Forestry*, 2(1):46-52.
4. Lakhani, R., Channa, S., Magsi, H., Koondher, A., Wang, J., Channa, A. (2020). Credit constraints and rural farmers' welfare in an agrarian economy. *Heliyon*, 6(10):1-9
5. Amanullah, W., Khan, I., Channa, S., Magsi, H. (2019). Farm level impacts of the credit constraints on agricultural investment and income. *Pakistan Journal of agricultural science*, 56(2):511-521.
6. Wang, J., Siraj, A., Shah, F., Huang, T. (2019). Economic impact of formal credit constraints on technical efficiency of wheat: Evidence from Sindh Pakistan. *Fresenius Environmental Bulletin*, 28(8):5888-5899

7. Amin, N., Tawah, R., Amin, A. (1999). *Financial Sector Reform and Women's Survival Strategies*. World Bank, Rural Development Group, Washington, USA.
8. Asiamah, T., Steel, W., Ackah, C. (2021). Determinants of credit demand and credit constraints among households in Ghana. *Heliyon*, 7(10):e08162.
9. Balana, B., Oyeyemi, M. (2022). Agricultural credit constraints in smallholder farming in developing countries: Evidence from Nigeria. *World Development Sustainability*, 1:1-12.
10. Bertrand, M., Teuwa Nkeuwo, M. (2011). *Articulations entre Banques Commerciales et Institutions de Microfinance en Afrique Sub-saharienne: cas du Cameroun*. Unpublished working paper, Centre for European Research in Microfinance (CERMi), Brussels, Belgium, retrieved at: https://mpra.ub.uni-muenchen.de/33015/1/MPRA_paper_33015.pdf, 15th September 2022.
11. Chandio, A., Jiang, Y. (2018). Determinants of credit constraints: Evidence from Sindh, Pakistan. *Emerging Markets Finance and Trade*, 54(15):3402-3410.
12. Conning, J., Udry, C. (2005). *Rural Financial Markets in Developing Countries*. In: *Handbook of Agricultural Economics, and Agricultural Development: Farmers, Farm Production and Farm Markets*, Evenson, R., Pingali, P., Schultz, T. (eds.), chapter 15, Elsevier, Amsterdam, the Netherlands, pp. 1-86.
13. Djomo, C., Rayner, T., Ndaghlu, N., Ukpe, U., Gama, E., Esuh, D., Mohamadou, S., Chahul, E., Oben, N. (2021). *Survey towards Cassava, Cocoyam and Yam production*. Internal data, University of Buea, Cameroon.
14. Djoumessi, Y., Kamdem, C., Afari Sefa, V., Bidogzeza, J. (2018). Determinants of Smallholder Vegetable Farmers Credit Access and Demand in Southwest region, Cameroon. *Economics Bulletin*, 38(2):1231-1240.
15. Dufour, D. (2013). *In Cameroon, a dynamic cassava value chain with weaknesses*. E-portal of the CGIAR, Montpellier, France, retrieved at: www.rtb.cgiar.org/news/in-cameroon-a-dynamic-cassava-value-chain-with-weaknesses/, 25th September 2022.
16. Erhabor, P., Emokaro, C. (2007). Relative Technical Efficiency of Cassava Farmers in the Three Agro-ecological Zones of Edo State, Nigeria. *Journal of Applied Sciences*, 7(19):2818-2823.
17. Fall, A. (2008). *Impact du crédit sur le revenu des riziculteurs de la vallée du fleuve Sénégal*. Thèse pour l'obtention du Diplôme de Doctorat en Economie et Gestion du Développement Agricole, Agro-alimentaire et Rurale, Université Montpellier, France.

18. FAOSTAT (2012). *Country profiles: Cameroon*. Data base of the Food and Agriculture Organization of the United Nations (FAOSTAT), Rome, Italy, retrieved at: www.fao.org/faostat/en/#data/QC, 19th August, 2022.
19. FAO(2009).*Improving Rural Financial Markets for Developing Microenterprises*. Food and Agriculture Organization of the United Nation (FAO), Rome, Italy, retrieved at: www.fao.org/docrep/007/, 15th September 2022.
20. Fogwe, Z. (2014). Agrarian Community Wetland Resources as Triggers of Intermittent Interaction conflicts in the Bali Nyonga basin of the Western Highlands of Cameroon. *Sci-Afric Journal of Scientific issues, Research and Essay*, 7(80):462-468.
21. Fouillet, C., Augsburg, B. (2007). *Spread of the Self-Help Group Banking Linkage Programme in India*. International Conference of Rural Finance Research: Moving Results, 19-21 March, FAO, Rome, Italy, pp. 1-9.
22. Greene, W., Hensher, D. (2009). Ordered choices and heterogeneity in attribute processing. *Journal of transport economics and policy*, 44(3):331-364.
23. Ibiang, O., Adinya, I., Ibom, L., Eni, L., Ibekwe, H., Ukorebi, B. (2012). Analysis of Credit Accessibility and Utilization among Intensive Small- Scale Pig Farmers in Central Cross River State, Nigeria. *Journal of agriculture, forestry and the social sciences*, 10(1):55-80.
24. IFAD (2011). *Roots and Tubers Market Driven Development Programme*. Portal of the International Fund for Agricultural Development (IFAD), Rome, Italy, retrieved at: www.ifad.org/en/web/operations/project/id/1100001238/country/cameroon, 26th September 2022
25. Khalid, M. (2013). *Access to Formal and Quasi-Formal Credit by Smallholder Farmers and Artisanal Fishermen: A Case of Zanzibar*. Mkuki na Nyota publishers, Dar es Salaam, Tanzania.
26. Koloma, Y. (2010). Effets de seuil dans la relation entre l'accès au microcrédit et l'amélioration du bien-être des bénéficiaires. *Mondes en développement*, 152(4):13-30.
27. Konings, J., Walsh, P. (1999). Disorganization in the process of transition: Firm-level evidence from Ukraine. *Economics of Transition*, 7(1):29-46.
28. Kumar, A., Singh, D., Kumar, P. (2007). Performance of rural credit and factors affecting the choice of credit sources. *Indian Journal of Agricultural Economics*, 62(3):297-313.
29. Meyer, R., Roberts, R., Mugume, A. (2004). *Agricultural Finance in Uganda: The Way Forward*. Technical report, GIZ, Bonn, Germany.

30. Mpuga, P. (2004). *Demand for Credit in Rural Uganda: Who Cares for the Peasants?* In: Conference on growth, poverty reduction and human development in Africa, Centre for the Studies of African Economies, Oxford, UK.
31. Nchare, A. (2007). *Role of credit institutions in enhancing resource productivity and efficiency*. AERC Research paper no. 165, African Economic Research Consortium, Nairobi, Kenya, pp. 8-41.
32. Nguyen, D., Nguyen, T., Nguyen, Q. (2021). Analysis of factors affecting the accessibility of official credit for households in Thua Thien Hue province. *Hue University Journal of Science: Economics and Development*, 130(5A):49-62.
33. Ntsama, E. (2000). *Etude Relative et a la Revision du systeme de Financement du PRSSE*. Rapport Definitive, MINFI, Yaounde, Cameroon.
34. Obianefo, C., Nwigwe, C., Meludu, T., Anyasie, I. (2020). Technical efficiency of rice farmers in Anambra State value Chain development programme. *Journal of Development and Agricultural Economics*, 12(2):67-74.
35. Sekyi, S., Abu, B., Nkegbe, P. (2017). Farm credit access, credit constraint and productivity in Ghana. *Agricultural Finance Review*. 77(4):446-462.
36. Sica, J., Strasser, B. (2001). Tontines in Cameroon: Linking Traditional and Semi-formal Financial Institutions System. *Development and Cooperation*, 1:21-22.
37. Silong, A., Gadanakis, Y. (2020). Credit sources, access and factors influencing credit demand among rural livestock farmers in Nigeria. *Agricultural Finance Review*, 80(1):68-90.
38. Tang, S., Guan, Z., Jin, S. (2010). *Formal and informal credit markets and rural credit demand in China*. In: AAEA, CAES & WAEA Joint Annual Meeting, July 2010, Denver, USA, Agricultural & Applied Economics Association, Milwaukee, USA, pp. 1-27.
39. Tchouassi, G. (2011). Macroeconomic analysis of informal financial markets: Empirical Analysis from Central African Countries. *Journal of Development and Agricultural Economics*, 3(4):150-156.
40. Twumasi, M., Yuansheng, J., Ntiamoah, E., Akaba, S., Kwabena, N., Boateng, L. (2020). Access to Credit and Farmland Abandonment Nexus: The Case of Rural Ghana. *Natural Resources Forum*, 46(1):3-20.
41. Vu, H., Ho, H. (2022). Analysis of Factors Influencing Credit Access of Vietnamese Informal Labors in the Time of COVID-19 Pandemic. *Economies*, 10(1):1-11.