Determinants of Informal Credit Demand and Supply among Food Crop Farmers in Akwa Ibom State, Nigeria

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Abstract

This study was designed to examine the determinants of credit demand and supply in informal credit markets among food crop farmers in Akwa Ibom State of Nigeria. A multi-stage sampling technique was adopted in selecting 96 credit-user, arable crop farmers and 24 informal credit sources from 6 villages. Primary data were collected from this total of 120 respondents through the use of a structured questionnaire. The simultaneous equation technique, using two stage least squares was employed to examine the determinants of credit supply and demand. Results of data analyses revealed that farm income, profit, education, and interest amount determined demand whereas liquidity, experience in lending and interest amount determined supply. It was from this study that informal credit suppliers consider several factors before supplying credit to the rural farmers. In line with the findings of this study, it was recommended that steps for reducing the high interest rates charged by informal credit suppliers should be taken. Education is an important factor influencing credit demand and use. Designing appropriate educational packages for farmers, both formal and informal such as evening schools and adult education programmes will be beneficial. Government and financial institutions should ensure that credit meant for farming are used for farming by putting in place measures to check abuse.

Keywords: Demand and Supply, informal credit, determinants, crop farmers

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1.0 Introduction

Irrespective of the extensive role played by the oil sector of the economy, agriculture still occupies a strategic position in the Nigerian economy. However, it is characterized by a multitude of small scale farmers scattered over wide expanse of land area, with small holding ranging from 0.05 to 3.0 hectares per farm land, rudimentary farming systems and tools, low capitalization and low yield per hectare (Ogundari & Ojo, 2007) leading to gross inadequacy of food. The food problem has been heightened by the relatively unavailability and low level of productive resources used by farmers in the country, a condition that is particularly worsened by poor use of credit. In Nigeria, empirical evidence has established a positive link between the declining agricultural productivity and limited credit facilities (Essien, 2009; Nwankwo, 1983; Nwaru, 2004). This situation threatens the capacity of farmers in their quest for sustainable production.

Credit availability to agriculture is justified when farmers are faced with low savings capacity, poorly developed rural financial markets and limited availability of appropriate farm technologies whose adoption is constrained by shortage of funds (Nwaru, 2004). The demand for credit is increased as a result

of increased economic activities in the informal sector (Tra & Lensink, 2004). This informs why farm credit has become a critical factor in modeling the growth of agricultural productivity and the development of the rural economy, which consists mainly of agriculturally based economic activities (Nwaru et al., 2004). Therefore, there were moves to popularise micro financing in Nigeria with the introduction of the Agricultural Credit Guarantee Scheme in 1970 which aimed at sensitising banks on the need to make loans accessible to micro businesses (Mejeha & Ifenkwe, 2007). This witnessed the establishment of specialised credit institutions and policies to encourage the regular banks to establish more rural branches. However, the nature and operation of these formal sources have failed not only to deliver credit to a larger proportion of the farmers but also, in promoting a viable delivery system, have caused an increase in the patronage to informal credit sources by rural farmers and other entrepreneurs (Egbe, 2000; Mejeha et al., 2007; Udoh, 2005). Apart from the inability of rural dwellers to access these relatively cheap funds, reducing the usurious rates of interest in the informal sector by lowering the cost of funds to the lenders is far from being achieved (Basu, 1997; Hoff & Stglitz, 1990).

Given these circumstances, informal credit sources are unquestionably the most popular sources of finance to the rural and urban population (Gebrekidan, 2006) because the formal credit sources have scared many food crop farmers due to the encumbrances surrounding its use (Udoh, 2005). Unregulated money supply, easy accessibility, easy liquidity and low administrative bottlenecks, collateral free lending, proximity, timely delivery and flexibility in loan transaction are some of the attractive features of informal credit sources to the farmers (Khandler & Farugee, 2001; Srinivas, 1993). Some of these informal credit sources as identified by Srinivas (1993) are relatives, friends, pawn brokers, rotating savings and credit associations, local money lenders and community groups.

Therefore analyzing the factors influencing the demand for and supply of credit would have significant policy implications which would be helpful in redressing the relative decline from low patronage of credit facilities. The major objective of this study is to analyze the determinants of credit supply and demand in the informal credit markets amongst food crop farmers in Akwa Ibom State of Nigeria.

2.0 Literature Review

Agricultural credit has been variously defined by authors. According to Nwaru (2004):

> agricultural credit is the present and temporary transfer of purchasing power from a person who owns it to a person who wants it, allowing the later the opportunity to command another person's capital for agricultural purposes but with confidence in his willingness and ability to repay at a specified future date. It is the monetization of promises and exchanging of cash in the present for a promise to repay in future with or without interest. Without the willingness and ability to repay, the promise to repay at a future date would be futile.

Credit can be in cash or in kind; however, our concern here is those in cash. This control over the use of money, goods and services of another person (Adegeye & Dittoh, 1985) termed credit is at a price usually regarded as the interest rate (Ellis, 1992), which is required to be paid together with the amount borrowed at a specified future period.

Credit is an instrument whose effectiveness depends on the economic and financial policies that go with it (Nwaru, 2004). If well applied, credit should increase the size of farm operations, introduce innovations in farming, encourage capital formation, improve marketing efficiency and enhance farmers' consumption (Nwagbo, 1989; Nwaru, 2004). However, Udoh (2005) reported that the demand for credit tends to be a derived demand, which indicates the borrowers will demand for credit based on the need for it and the satisfaction to be derived.

The demand and supply of credit is influenced by several factors such as personal attributes of the individual, area specific attributes and credit source attributes (Udoh, 2005). These attributes influence individuals differently irrespective of their gender such that what might determine the demand for credit by a particular female farmer might be different from what determines credit demand by another farmer. For instance, in studying informal lenders and formal credit groups in Madagascar, Zeller (1994) indicated that informal lenders and group members obtain information about the wealth, indebtedness and income potential of loan applicants and hence ration loan demands an in-depth view of total household wealth and leverage of the household. In line with this, Nwaru (2004) examined rural credit markets and resource use in arable crop production in Imo State, Nigeria, using multiple regression analysis by the two stage least squares. The result revealed that credit demand was significantly influenced by interest rate, educational level of farmer, amount borrowed previously, farm size and gross savings, while gross income of lender, total cost of lending, source of loan (whether formal or informal), worth of loan application and previous loan repayment significantly influenced credit supply.

The total amount of money a borrower would have asked for given a favorable borrowing and investment conditions will also depend on the age of the farmer, farm size, educational level of the farm household head, distance of technical services (km), household size, socio-economic associations such as age grade, co-operative societies and farmer and women associations (Ewuola & Williams, 1995). Considering the rate of interest and profitability as one of borrowing and investment conditions, a farmer would borrow funds when the expected rate of return from the project is greater than the cost of the borrowed funds. According to Sylvanus (2003),

> expected income ($_eY_t$), output gap (Y_{-t}), the real rate of interest (R_t) and the expected inflation rate ($_eP_t$) explained the real demand for credit (L^d_t). The demand for credit is expected to depend negatively on the real rate of interest as bank business customers may be expected to delay investment when interest rates are rising. The inflation rate is used here as a proxy for general macro-economic conditions and is negatively related to demand for credit. In addition, expected decline in inflation may also affect credit demand by increasing the real cost of debt payment. Furthermore, the study revealed that income is expected also to affect credit demand positively. The inclusion of output gap (Y_{-1}) as an explanatory variable is intended to gauge the impact of the deviations of the output from its long-term trend.

Using a probit model to study the determinants of demand for credit, Dutta & Magabich (2004) reported that

> individual characteristics, household characteristics, repayment ability variables that reflect the individual's ability to secure a loan and other

factors affecting the individuals' decision such as having social events and responsibilities, religious beliefs, application cost, availability of lender in local areas and availability of a mediator affected farmers' demand for credit. The result of that study revealed that male individuals were less likely to apply for credit than female individuals. This may reflect the male's ability for self-financing or the ability to access other credit markets or lack of demand for micro credit. Being single and having a tendency for being financially independent from family, being the head of household, having enough knowledge about sources of credit, availability of microfinance providers and having effective loans schemes were reported to increase the probability of applying for loans.

The negative experiences faced by farmers and entrepreneurs in the formal financial market have brought about a renewed interest in the operations of the informal financial market and its place in the mobilisation and allocation of funds (Srinivas, 1991). Favorable comments on the workings of indigenous savings and credit groups as autonomous (self-help) institutions, have brought home the fact that the informal sector is made up of several other actors and modalities of financial intermediation, than those of money lenders, traders, and landlords (Bourma, 1979). Thus, while there can be little doubt of the formal sectors' superiority over the informal sector, when it comes to financing large scale economic development and projects of national and regional importance, the role and the strength of informal finance agents in small-scale economies and their subsequent importance to low income households should not be under-estimated (Srinivas, 1993).

Formal credit institutions are bogged down in their functions by government regulatory controls, interest rate limits, loan ceilings, collateral requirements, high administrative and procedural costs, and subsidized discounts (Srinivas, 1991). These processes consequently reduce their share of the credit market leaving a huge gap in the demand and supply of credit (Hoff et al., 1994). This is where the informal credit markets move in with the advantages of unregulated money supply, easy accessibility, easy liquidity, low administrative and procedural costs, little or no collateral, and flexibility in interest rates and repayment schedules (Srinivas, 1993).

Informal operations are therefore highly heterogeneous, with a wide variety of operations and services, including information lending and borrowing, using a wide variety of debt instruments (Germidis, 1990). Srinivas (1991) pointed out that the common elements which run through informal credit arrangements is their informality, adaptability and flexible options. This reduces their transaction cost and gives them comparative advantage and economic rationale over formal finance. Srinivas (1993) further indicated that

> the informality in informal finance is characterized by unregulated and non-subsidized finance, easy accessibility, loan availability in very small size and for short periods, low administrative and information costs, little or no collateral, flexible and variable interest rates, highly flexible transactions and repayments tailored to individual needs. However, as a result of the above characteristics, flexibility dominates informal credit operations and this enables them to reach borrowers beyond the profitable reach of the formal sector with lower transaction costs.

3.0 Methods

Akwa Ibom State is located in the South Eastern part of the rain forest zone of Nigeria. The State lies between N 4.33 - 5.33 and E 7.25 – 8.25. It lies along the South Eastern coastal plains bordered by Cross River, Rivers, Abia and Ebonyi States. The State has an extensive shoreline 129kms in length long and surrounds the Qua Iboe River Basin and the eastern parts of both the lower Cross River Basin and the Estuary of the Imo River. Its climate is typically tropical, hot and humid (Akwa Ibom State Ministry of Economic Development, 2004).

Akwa Ibom State is made up of 31 Local Government Areas divided into the six Agricultural Zones of Uyo, Ikot Ekpene, Oron, Eket, Abak and Etinan. It is also densely populated with a population of about 3.9 million people (National Population Commission, 2006). According to the Akwa Ibom State Ministry of Economic Development (2004), the farm families are characterised by eight to ten members with 80% of the farmers owning their land. Furthermore, the average farm plot is below one hectare with many farmers still allowing short fallow periods. The main crops grown are cassava, oil palm, maize, plantain, cocoyam, okro, fluted pumpkin, water leaf, rice, rubber, and raffia palm. Other crops grown in lesser quantities are mangoes, citrus, cocoa, kola and cowpeas. The State has a bimodal rainfall pattern with the rains lasting, on the average, for eight to nine months followed by a short dry season. The rains are heavy and begin March and end in November, peaking in July and September. The weather can also support appropriate crops all round the year (Akwa Ibom State Ministry of Economic Development, 2004). Most small scale farmers in the State depend on informal sources for finance and these sources range from local money lenders, neighbours, relatives, friends to rotating savings and credit associations (Udoh, 2005).

A multistage sampling technique was used in this study. Two Agricultural Zones, *Uyo* and *Abak* were randomly selected from the six Agricultural Zones of the State. In the second stage, six Local Government Areas (*Uruan, Ibesikpo, Uyo, Etim Ekpo, Abak, Ukanafun*) were randomly selected from the two Agricultural Zones. In the third stage, one clan each was randomly selected from each of the six chosen Local Government Areas. These clans were *Ibiaku Uruan, Ibesikpo Asutan, Uyo, Uruk Ata, Otoro*, and *Ikot Akpan*. One village each was then randomly selected from each of the clans selected in the last stage. The villages were *Utit Uruan, Nung Udoe, Ikot Akpa Abia, Nkwot, Uruk Uso*, and *Idem*. From each of the chosen six villages, a list of informal credit sources was obtained from the village secretaries who were the key informants. These formed the sampling frames from which samples of four respondents were randomly selected per village. In all a total of 24 informal lenders were randomly selected for detailed study. Another list of food crop farmer borrowers was obtained from the selected lenders from each village. These formed the sampling frame from which 16 borrowers were randomly selected from each village, making a total of 96 borrowers. Data collection on some of the socio-economic characteristics of the respondents and their credit operations was based on the 2007 farm year. Primary data were collected from the chosen samples using structured questionnaires.

Data analysis was by regression analyses. The simultaneous equation model was employed here and the estimation was done using two stage least squares. The implicit functional forms were specified thus (Gallagher, 2001; Katchova, 2005; Nwaru, 2004):

$$CRD = f(EDU, FIC_{t-1}, HHS, INT, GEN, PRF_{t-1}, FZE, U_i) \qquad (1)$$

$$CRS = f(LIQ, LEV, EIL, GEN, SUR, INT, U_i) \qquad (2)$$

Where CRD is Credit Demand in (₦) measured by the total amount the farmer asked for whether or not he was given. EDU is the educational level of the farmer measured by the total number of years the farmer spent in receiving formal education. FIC_{t-1} is farm income (₦) measured by the income of the farmers from farming in the previous year. HHS is household size, describing the number of people living with the farmer and whose responsibilities he bears. INT is interest amount (₦) measured by the total amount the farmer paid as interest charges on money borrowed. Gen is gender of the farmer which was defined as unity for male farmers and zero otherwise. PRF_{t-1} is gross farm profit of the previous year (₦). FZE is the farm size in hectares measured by the total land area under arable crop production. CSS is Credit Supply (₦) measured by the total amount of money the lender was willing to make available for borrowing. LIQ is the liquidity of the lender, measured by current asset/current liability of his farm business. LEV is the business leverage of the lender measured by current debt/owners equity. EIL is the experience in lending measured by the number of years the lender has been in the business of lending. SUR is provision of a surety or guarantor for loans (binary; unity if surety or guarantor was considered and zero otherwise). INT is interest amount (₦) measured by the total amount the lender received as interest charges on money lent. U_i is the error term assumed to fulfill all the assumptions of the classical linear regression model.

Equations (1) and (2) were subjected to simultaneous equation analysis. The identification conditions of the system of equations were considered. They were found to be over identified and therefore estimated by using the two-stage least squares method.

4.0 Results

4.1 Estimated Credit Demand Function

The estimated credit demand function was summarized and presented in Table 1. The F- ratio was statistically significant at 1 percent. This implies that the sample data fit the model and that the independent variables are important explanatory factors of the variations in credit demand. The R^2 was 0.6910 indicating that about 69% of the variation in the amount of credit demanded by food crop farmers was explained by farm income, household size, profit, farm size, gender of the farmer, level of education, and interest amount payable. However, the coefficients for household size, farm size and gender of the farmer were not significant even at the 10% level.

The co-efficient of farm income was statistically significant at 1% and, in conformity with *a priori* expectations, it was positively signed. *Ceteris paribus*, increase in farm income would lead to increased saving which could be re-invested leading to increased business activities and a concomitant increase in credit demand. Moreover, lenders would prefer to grant credit facilities to farmers whose income is high because they have higher chances of repaying the loan. This result reflects the pecking order theory which states that firms will first use internal equity financing, followed by external debt financing and finally external equity financing. This result is in agreement with Nto (2006) & Essein (2009) who reported a positive and significant relationship between credit demand and farm income. Nwaru *et al*. (2008) reported a positive relationship between credit demand and saving (used as a proxy to measure the influence of farm and nonfarm sources of income on credit demand).

Table 1. *Estimated Credit Demand Function*

Variable	Coefficient	Standard Error	t-ratio
Intercept	-53995.480	26231.800	-2.058**
Farm Income	0.291	0.109	2.670***
Household Size	719.925	3313.877	0.217
Profit	0.715	0.325	2.200***
Farm Size	-2192.263	6333.153	-0.346
Gender	-0.958	0.617	-1.55
Education	6164.737	1629.933	3.782***
Interest	-7.584	0.877	-8.648***
R^2	0.6910		
R^{-2}	0.6690		
F-ratio	32.654***		

Source: Computed from field survey data, 2008
***, **, * = statistically significant at 1, 5, and 10 percent respectively.

The coefficient for farm profit was significant at the 5% level and positively signed. This conforms to *a priori* expectations and to Essein (2009). Increase in profit would lead to increase in amount of credit demanded. Nwosu (1998) noted that profitability is a criterion for granting loans by banks and other credit agencies to the farmers. This implies that a major tool for repositioning the rural credit markets would be to provide anappropriate rural socioeconomic enviroment that will yield the enabling environment for higher levels of farm business successes, incomes and profit.

The level of education of the farmer was statistically significant at the 1% level and maintained the right *a priori* positive sign with credit demand. This result is in line with Nwaru (2004), who explained that educated farmers are more amenable to risk taking than non-educated ones because they are better equipped to access, evaluate and understand improved production techniques. This implies that as education is made more functional and accessible to farmers and other rural entrepreneurs, policies and programmes for sustainable farm credit provisioning should also be considered.

Amount the farmer pays as interest on money borrowed was significant at the 10% level and had a negative sign. This is in agreement with *a priori* expectations and with the results from Desai & Mellor (1993), Eboh & Akpomedaye (1995), Nwaru (2004) and Essein (2009). Interest is the unit cost for taking credit. *Ceteris paribus,* as the price increases, credit demand decreases and vice versa.

4.2 Estimated Credit Supply Function

The estimated credit supply function was summarized and presented in Table 2. The F-ratio was statistically significant at 1%. This implies that the data fit the model and that the independent variables were important explanatory factors of the variations in credit supply. R^2 has a value of 0.9750 which implies that 98% of the variation in the amount of credit supplied was explained by interest amount, experience in lending, leverage, liquidity, and availability of surety.

In conformity with *a priori* expectations, liquidity was significant at 1% and positively signed, implying that as the liquidity of the lender increases, supply of credit increases. That is, informal lenders will respond to higher level of liquidity by adjusting upwards their credit supply. This result is in line with Tra et al. (2004) & Essein (2009) who indicated that informal lenders readily disburse credit to prospective borrowers based on the level of their liquidity.

Table 2. *Estimated Credit Supply Function*

Variable	Coefficient	Standard error	t-value
Intercept	-944527.64	23226.94	-4.070***
Liquidity	5.290	1.283	4.123***
Leverage	-1694.016	1529.736	-1.017
Surety	1140.484	9871.654	0.115
Gender	1.978	0.413	4.789***
Experience in lending	413.168	207.475	1.991*
Interest	40.625	2.619	15.116***
R^2	0.9750		
R^{-2}	0.9710		
F-ratio	242.473***		

Source: Computed from field survey data, 2008
***, **, * = statistical significant at 1, 5, and 10 percent

The coefficient of gender is significant at the 1% level and positively signed. This is in line with *a priori* expectations. Informal credit suppliers will usually disburse credit depending on the gender of the farmer. Since this is a dummy variable defined as unity for males and zero for females, it implies that male lenders supplied more credit facilities than their female counterparts. This result might be explained by the observation from authors like the World Bank (2005) & Johnson (2006) which indicated that the female gender at individual, household, and wider community and national context are affected by financial, economic, cultural, political and legal obstacles. This requires appropriate economic policies to deal with these obstacles as they pertain to the female lenders while at the same time strengthening the economic activities of the male lenders.

The coefficient for experience in lending was significant at 10% and has a positive relationship with credit supply. This agrees with *a priori* expectations and the reports from Nwaru *et al.* (2004) & Essein (2009). The number of years a lender has been involved in lending may give an indication of the practical knowledge he has gained on how to overcome the problems associated with lending at minimal costs. Such practical knowledge would help him to handle loan applicants better; critically sorting them for honesty and genuineness. Nwaru *et al.* (2004) observed that this would lead to a reduction in the risk of his loan portfolio and an increase in the supply for credit. Therefore, experience in lending should be considered as a critical factor in modeling the development of informal rural markets.

In the credit market, interest is paid by the borrower to encourage the creditor to forgo his potential command over current output and future investment possibilities (Nwachukwu, 1994) and to cover the cost he incurred in administering and possibly supervising the loan (Nwaru, 2004). Therefore,

interest is the price of money lent. The coefficient for interest amount was positively signed and statistically significant at 1%. The implication of this result is that as the rate of interest increases, credit amount supplied will equally increase *ceteris paribus*. This result is consistent with *a priori* expectations and Nwaru (2004), who reported that interest receivable played a significant and positive role in determining the volume of credit supplied.

5.0 Discussion and Conclusions

This study was designed to examine the determinants of credit demand and supply in the informal credit markets by food crop farmers in Akwa Ibom State of Nigeria. Primary data were collected from the chosen sample of 120 food crop farmers using a structured questionnaire. The analyses of data using simultaneous equations by the two stage least squares model to estimate credit demand and supply functions revealed that interest amount significantly influenced both functions at 1% and signed according to *a priori* expectations. Other significant determinants of credit demand include farm income, profit and education, household size and farm size. Credit supply was significantly influenced by liquidity and experience in lending. Leverage and surety had no significant influence on credit supply though they were appropriately signed.

It could be concluded from this study that informal credit suppliers consider several factors before supplying credit to rural farmers. In line with the findings of this study, it is recommended that steps for reducing the high interest rates charged by informal credit suppliers should be taken. Education was an important factor influencing credit demand and use. Designing appropriate educational packages for farmers, both formal and informal such as evening schools and adult educational programmes, will be good. Government and financial institutions should ensure that credit facilities meant for farming were used for farming by putting in place measures to check abuse. This is because it has been observed that farmers sometimes borrow money in clear understanding that it is meant for farming and then divert the borrowed funds to some other uses.

Finally, it should be noted that, extending credit alone is not a sufficient condition to reduce poverty and improve productivity and income. Therefore, additional intervention that goes hand in hand with micro financing should be implemented. That is, securing an appropriate operational environment for informal credit operators and markets for their products as well as providing appropriate educational services, training and skill development on how to manage effective and efficient business are needed amongst the operators of rural credit markets.

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