Determinants of Credit Demand by Smallholder Farmers in Kenya: an Empirical Analysis

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Abstract

In many developing countries, official credit programmes have been used as important components of rural development. However, the failure to properly identify the credit needs of the target groups has been blamed for the limited success experienced in many of such credit programmes in the developing countries.

With the use of farm level cross sectional data from Nakuru district of Kenya, this article analyses the significance of institutional lending terms and conditions in determining farmers' demand for credit. The results show that such terms and conditions significantly, but negatively, influence farmers' demand for institutional credit, effectively discouraging them from seeking such credit. The insignificance of interest rate in determining demand for credit, reinforces the use of nonprice credit rationing in allocating credit funds to farmers. The article proposes the use of a market rate of interest as a means for reducing such rationing and increasing the access of more small scale farmers to credit.

1   Introduction

Credit can be seen in the context of financial intermediation. Among other things, an effective financial intermediation contributes to development by facilitating resource mobilisation and efficiency in the allocation of such resources (VON PISCHKE, ADAMS and DONALD 1983). In many developing countries, there has been a trend to increase the flow of credit especially to the small scale farming sector. For a long time, credit has been viewed as an important tool for promoting the development of agriculture. However, the importance of credit not withstanding, an important contention has been its timing. When should credit be available in order to maximise its benefits? Two views have dominated here. The supply leading view - in which credit should precede technological innovation in order to induce economic growth, and the demand following view - in which the provision of credit should respond to the existing demand for financial services. According to the demand following view, credit can only be useful when the development process has began and peasants have shown themselves as willing to invest

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from their own resources (MILLER 1977; DONALD 1979; PENNY 1983). Credit can therefore become an instrument of progress only after there has been some development, and farmers have shown themselves as willing and able to invest wisely. The provision of credit to small scale farmers has mainly been criticised for not considering the farmers' ability to utilise additional funds effectively.

In many developing countries, "official" credit programmes have become important components of development expenditure (IQBAL 1983). Meeting the credit needs or demand by farmers has often been the main reason behind efforts soliciting support for credit programmes (VON PISCHKE 1991). However, despite this emphasis on credit, their empirical basis has been surprisingly weak as evidenced by the limited success of such credit programmes. Certain important issues have however received inadequate attention, among them the link between the demand for credit and the institutional factors influencing it. The failure to properly identify the credit needs of the target group has been widely blamed for the limited success of many credit programmes in the developing countries. In many such programmes, credit has been offered according to the perceived needs, and not the amount of funds or any other resources that farmers could be expected to reasonably handle, therefore not incorporating any risks that the farmers face. Desai and Mellor (1993), state that although credit provides the basis for increased production efficiency, the institutions for credit provision may be inadequate for these needs. Formal loans must therefore be better suited to the borrowers' needs for them to be accepted.

Credit demand by farmers depends on many factors, among which the forms of production and the extent of market integration are important. In most cases, the demand for credit is not in accordance with what the financial institutions provide. The rural population's need for credit cannot therefore be established simply by observing the funds they receive since this is often merely a reflection of the existing supply system (SCHMIDT and KROPP 1987). Agricultural lending should therefore be organised so as to be able to recognise the productive lending opportunities in their areas of operation. The existing financial institutions can then be seen in terms of their roles in meeting the credit demand of the target groups. This leads to greater efficiency of allocation in the lending operations through a clear identification of true credit demand, which is, in turn, determined by the borrowers' ability to manage credit financed investment and to service the debt (ROBERTS 1985).

Empirical work on the demand for credit by small scale farmers offer different explanations for the lack of demand for formal credit among the rural poor (ADAMS and NEHMAN 1979, LONG 1968, PANI 1966). Factors determining the demand for credit therefore deserve special examination and evaluation. The significance of credit demand draws from the fact that the appropriateness of any credit programme to the production objective of farmers is important for it to succeed (ATIENO 1994). Factors determining the borrowing behaviour of farmers therefore need to be analysed. Among the factors important in determining the borrowing behaviour of farmers are the institutional lending terms and conditions, which apart from being used to ensure the continuity of the credit programmes, also influence farmers' access to credit and their borrowing decisions.

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Where the credit duration, terms of payment, required security and the provision of supplementary services do not fit the needs of the target group, potential borrowers will not apply for credit even where it exists, and when they do, they will be denied access (SCHMIDT and KROPP 1987).

This article analyses the significance of the institutional lending terms and conditions and other factors in determining the farmers' borrowing decisions, and demand for credit in Nakuru district of Kenya with the use of cross sectional primary data.

2 Methodology

2.1 Specification of the Empirical Model

The empirical model consists of an equation representing the demand for funds. Theoretically, the demand for credit funds is determined by farmers' initial resource endowment, current and expected income, a measure of investment opportunity and current and expected output prices.

Assessment of the initial endowment of the farmer is necessary to take account of the farmers' repayment capacity in case of failure in the intended project. In this analysis, this was "proxied" by the amount of land owned by the farmer. Land confers both status and security on the owner such that it offers a reasonable measure of initial endowment.

A common variable used to measure investment opportunity is the research expenditure, based on the assumption that research expenditure in a region results in enhanced investment opportunity and signify a commitment by the government to continue improvements in agriculture (IQBAL. 1983). Due to unavailability of this information, the value of farm investment made by the farmer in his farm was used as a measure of investment opportunity. This was based on the argument that farmers' investment in his farm is a response to the favourable investment opportunities available in the region.

Expected income was "proxied" by both farm and non-farm household income. This was intended to account for the variation in demand for funds that result from variations in household income. It would be expected that the greater the expected future income, the higher the tendency to borrow in anticipation of it.

The current and expected output prices were excluded since they were considered invariant in cross section data.

To reflect the effect of the lending terms and condition, on the demand for credit, institutional factors were also included in the model. These include:

Collateral value, noninterest credit costs, farming experience and interest rate.

The functional relationship between credit demand and the factors determining it was therefore specified as follows:

$$D = f(FY, NFY, LN, IR, NIC, FE, CV\ e)$$

Where the variables are defined as follows:

> D is demand for credit funds by households
> FY is farm income
> NFY is nonfarm income
> LN is land
> IR is interest rate
> NIC is the non interest credit costs
> FE is Farming experience
> CV is the collateral value
> e is the error term

2.2 Data Type and sources

Primary cross sectional data was used in the analysis. This was collected by administering structured questionnaires to sampled farmers in Nakuru district of Kenya. These were the farmers who had received credit from the two main credit sources in the district, Agricultural Finance Corporation and the Cooperative societies. In chosing the sample, stratified and systematic random sampling techniques was used.

3   Results and discussion

Assuming a linear relationship between credit demand and the specified variables, a multiple linear regression model was estimated to establish the significance of the selected variables. The general form of the model is given as follows

$$Y = a + bX_i + u_i$$

> Where Y is the dependent variable
> a is the constant term of the regression
> b_i is the regression coefficient
> X_i is the vector of the independent variables
> u_i is the error term

The results are presented in table 1.

From the results farm income, nonfarm income and the interest rate were not statistically significant at any conventional level of significance. The remaining variables were found to be statistically significant at the 1 % and 5 %-levels. The F-ratio was also significant showing the significance of the explanatory variables in explaining changes in the demand for credit by the surveyed farmers. The R^2 of .39 shows that only 39 % of the changes in demand for credit are explained by changes in the specified variables. There are other factors which are not captured by the theoretical and institutional factors specified in the study. These results are however not unique for a cross sectional study of this kind. Similar studies, Iqbal (1983) estimated the demand function for farmers in rural India and only found an R^2 of .08 and .14 for his samples.

Table 1: Regression Results of the Factors Determining the Demand for Credit by Farmers in Nakuru District, 1991. Source: Computed from survey data 1992

Independent Variable Coefficient	Estimated	T-value
Constant	9.46	14.316**
Farm income	-.001	-.725
Nonfarm income	.002	.523
Total land owned	.07	3.333**
Farming experience	-.05	-3.168**
Collateral value	.004	1.881*
Interest rate	-.02	-.719
Non-interest credit costs	.003	3.194**
R^2	.44	
Adjusted R^2	.39	
F-ratio	8.88**	

** Significant at the 1 %-level.
* Significant at the 5 %-level.

The dependent variable is the amount of funds applied for by the farmers. The explanatory variables are defined as follows:

- Farm income is the gross value of farm production during the period studied;
- Nonfarm income is the total income earned from activities other than farming;
- Total land owned is the total area of land by the farmers in acres;
- Farming experience is the number of years that the farmer has been engaged in the same activity;
- Collateral value is the value of land or produce given as security for the loan;
- Interest rate is the rate of interest that the farmer is charged for the loan by the institution;
- Non-interest credit costs are the costs other than interest, incurred by the farmers in the process of acquiring credit like application fees, transportation and other miscellaneous costs.

Farm income, although having the expected sign of its coefficient, was not statistically significant. Other studies on credit demand (NYIKAL 1990) also found farm income not to be significant in determining the demand for credit funds in rural Kenya. This could be explained by the fact that in comparison to the factors which define the lending criteria (like participation in the funded activity), income is relatively less significant.

Interest Rates and the Non-interest Credit Costs

While the interest rate is not significant, the non-interest costs of credit is statistically significant at 1 %. The non-interest borrowing costs of credit have earlier been found to strongly affect the willingness of the rural poor to seek loans and therefore constitute a more appropriate price for credit to the farmers (ADAMS and NEHMAN 1979). This is mainly due to the elaborate application procedures which disproportionately increase the cost of credit to smaller farmers. Demand for credit is largely less elastic with respect to interest rate, compared to other non-interest costs of credit. This is particularly true where interest rates are kept artificially below the market rate of interest. Desai and Mellor (1993) however show that although real interest rate is a relatively less important variable than other variables in influencing demand for rural credit by farmers, it is a more important determinant in the low-income countries than in the middle-income or high income countries. This can be explained by the high inflation rates and the subsidised interest rates in these countries which make the cost of funds artificially very low.

Previous studies on rural demand for credit in Kenya also show that interest rate or factors related to it are statistically insignificant, or less significant in the demand for credit (DESAI and MELLOR 1993). David and Wyeth (1978) looking at commercial bank loans in rural areas of Kenya found that farmers normally express insensitivity to the level of interest charged on their loans, and would not be affected by an increase in interest rate variations in terms of the amount of credit they would like to borrow.

Interest rate, although having the expected negative coefficient, is not statistically significant. Where interest rates are set below market rates, it no longer becomes a determining factor in farmers' demand for funds, a fact confirmed by and reinforcing the existence of nonprice credit rationing in the credit market. The widely used concessional rates and the large transaction costs discourage the financial institutions from lending to the rural poor. The differences in these costs also affect the small farmers' willingness to seek loans. Hence, borrowing transaction costs like application fee, forced purchase of other lender services, travel expenses and time for credit services become more relevant consideration in assessing farmers demand for credit services.

The positive coefficient of the non-interest credit costs however needs further discussion. It implies that as the non-interest costs of credit increases (in this case application and transportation costs), the amount of credit demanded by the farmers also increases. In reality, this means that as the application and transportation costs increase, raising the farmers' transaction costs, it becomes uneconomical to apply for small amounts of credit. Small farmers who cannot afford large amounts of loans or the high transaction costs are therefore, in effect, sieved off by the elaborate application procedure. This is because such costs make up a large part of the borrowing costs for many small farmers but much less for the large farmer (see ADAMS and NEHMAN 1979). It can be argued that at low transaction costs, farmers can apply for low amounts of credit economically. But considering the cost of the intended project and the minimum viable level of farm activity that can be funded, low amounts of credit might neither be feasible nor useful.

The transaction costs are also important because they influence the net returns obtained by the farmers from such credit services. Hence, whereas interest rates are set low as an incentive to increase credit to farmers, the objective is defeated by imposing strict lending criteria which only ration out credit to small farmers with limited resources. This argument is also supported by the positive and significant coefficient of the collateral value.

Institutional Lending Terms

The credit allocation problems within the financial institutions, particularly the widely used concessional interest rates and the large lender transaction costs greatly discourage the financial institutions from lending to the rural poor. It has been suggested that applying high interest rates on farm credit would in fact allow less stringent requirements for security which are normally the decisive barriers for many small enterprises (ADAMS and NEHMAN 1979; SCHMIDT and KROPP 1987). This is proved by the findings of the regression analysis which show the main security requirements (land owned and value of collateral) as significant determinants of credit demand by farmers. Evidence from the Grameen Bank also shows that high-cost credit can keep the influential nontarget group from a targeted credit programme, by eliminating the rationing of credit (MAHABUB 1988), hence helping to ensure its success.

The most common form of collateral required by the institutions is land and marketed produce. Hence the higher the value of collateral required, the higher the amount of credit that will be applied for by the farmer. That is, farmers who can offer higher values of collateral will go for higher amounts of loan as compared to those who cannot. This case is more true for the co-operative societies where the amount of loan disbursed is equated to the value of the marketed produce. Hence the more they produce for the market, the more credit they can get from the co-operatives. The farmer's ability to use additional funds is not taken into account and this might only lead to increased inequality where farmers at low levels of production who are constrained by lack of financial resources do not get the financial means to enable them raise their production above current levels.

Land owned has a positive coefficient as expected. The higher the amount of land owned, the higher the amount of loan that the farmer is likely to apply for. Farmers with small areas of land will apply for small amounts of credit which might not be adequate for his activity nor correspond to his ability to manage additional investment.

Farming experience has a negative coefficient and is statistically significant at the 1 %-level, implying that the more experienced farmers are likely to apply for less credit while those with less farming experience are likely to apply for more. This could be explained by an aspect of managerial ability whereby farmers with more experience either know how much credit they need for their activities, or how much they expect to get from the institutions.

4   Conclusions

From the results displayed in the forgoing sections, the main conclusion that can be drawn is that institutional lending terms and conditions employed by the credit institutions do not address the nature of credit demand by farmers in the district. This is due to the elaborate application procedures with its implications for noninterest costs to farmers, the eligibility criteria and security requirements. Elaborate application procedures, displayed in document processing, application fees and transportation costs which culminate in the significance of the noninterest costs of credit in farmers' demand for credit. As the noninterest credit costs of credit increase, it becomes uneconomical for farmers to apply for small amounts of credit. Small farmers who cannot afford large amounts of credit are effectively seaved off from credit applications. Measures to simplify the application procedures and reduce the transaction costs are therefore necessary.

The use of land as collateral ignores the farmers' ability to use funds. Farmers whose land ownership do not reach the minimum requirement are disqualified from receiving credit although their capacity to use additional funds has not been fully exploited. Land as collateral also does not necessarily guarantee loan repayment by farmers at all, hence it can be argued that its use as a means of securing loans mainly acts to restrict demand for credit by small scale farmers who do not have adequate land.

The use of concessional interest rates reinforce the nonprice rationing criteria on various credit programmes to restrict farmers' demand for credit. This is explained by the non significance of interest rate in determining demand for credit funds. Since the interest rates charged is relatively low compared to the opportunity cost of funds, it becomes a less significant consideration in farmers' borrowing decisions, who become less responsive to it. This article therefore shows that the low interest rates makes it a less significant factor in the demand for credit, necessitating the use of non price rationing criteria to control the demand. This provides an important policy instrument for improving the supply of credit to farmers. Increasing the interest rate on farm credit to commercial rates would reduce the use of nonprice rationing and allow the allocation of funds to the most profitable uses. This will allow increased access of small scale farmers to credit since the use of subsidised credit simply implicitly implies the rationing out of small scale farmers who do not meet the other allocation criteria. So long as small scale farmers are willing to pay the "high" market rates of interest, they should be qualified to receive credit since this will be a reflection of their willingness and ability to invest credit funds in into profitable uses which will enable them to repay the loan and realise a net gain. However, it should be observed that there is a limit to how much the interest rates can be increased without choking off rural demand for funds. In addition, the use of non-preferential rates of interest may not necessarily lead to increased access to credit if the other noninterest credit costs both to the farmers and the institutions are not rationalised.

Determinanten von Kreditnachfrage bei Kleinbauern in Kenia: Eine empirische Analyse

Zusammenfassung

In vielen Entwicklungsländern sind offizielle Kreditprogramme wichtige Instrumente für die ländliche Entwicklung. Die nicht genau identifizierten Kreditbedürfnisse der Zielgruppen ist oft Ursache für den geringen Erfolg solcher Programme.

Mit Daten aus dem Nakuru Distrikt analysiert die Arbeit die Signifikanz der institutionellen Kreditbedingungen im Hinblick auf die Nachfrage der Bauern, die unter den Bedingungen negativ ist. Die Arbeit befaßt sich mit Vorschlägen zur Verbesserung der Situation.

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