

Farm Credit Constraint and Inclusive Growth in Selected Areas of Coimbatore District— Probit Analysis

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INTRODUCTION

One of the key objectives of the eleventh plan is inclusive growth. Financial inclusion has become an issue of concern to all economies of the world. The NABARD working group on financial inclusion (2007) had defined financial inclusion as the process of ensuring access to financial services and timely and adequate credit needed by vulnerable groups such as weaker sections and low income groups at an affordable cost. In India, the total flow of agricultural credit had increased from Rs.885.16 crore in 1950-1951 to 1,17,899 crore in 2005-2006.

Though there was increase in the flow of institutional credit, the non-institutional credit accounted for 38.9 percent in the year 2002. (All India Debt and Investment Survey, 2002). It revealed that notwithstanding the outreach of banking, the formal credit has not been able to adequately penetrate the informal financial markets. Rather, it seems to have shrunk in some respects in recent years (Throat, 2006). It revealed the absence of adequate institutional credit in agriculture even after various agricultural credit policy oriented reforms.

The small and marginal farmers constitute 80 percent of the operational holdings and cultivate nearly 36 percent of the area in India. Due to their small holdings, they are disadvantageously placed with respect to their access to technology, capital, credit and other institutional support (Sidhu and Gill, 2006).

The share of commercial banks in their lending to marginal farmers was only around 20 to 30 percent during 1972-2005, whereas the medium and large farmers had received more than 45 percent of the share during the same period.

METHODOLOGY

The study is based on the primary data. The Coimbatore is one of the agriculturally advanced districts in Tamilnadu and surrounded with more agricultural research stations. Among 19 community development blocks in the district, the Thondamuthur block was the high credit intensive block based on the average availability of credit in the district. Hence the Thondamuthur block was selected for the study. The period of the study was pertaining to the crop year 2005-2006. The farmers were classified as credit constrained and credit unconstrained, based on the survey responses of the farmers. In the post stratification, there were 51 credit constrained and 74 credit unconstrained farmers in Thondamuthur block.

A farmer is credit constrained when he demands more than the availability of credit from the credit institutions. Hence credit constraint and the financial exclusion is a function of farm and farmer characteristics affecting both availability and demand for credit. The availability and demand for credit were determined by a set of farm and farmer characteristics such as area under cultivation, farming experience, education, family size, non-farm income and availability of own fund to invest.

The probability of a farmer to be credit constrained is estimated, based on the above farm and farmer characteristics using probit equation

$$G^* = \gamma z + \varepsilon \text{ (Feder et al., 1990 and Foltz, 2004)}$$

where G = probability of a farmer to be credit constrained or credit unconstrained.

γ = parameter co-efficient

Z = area under cultivation (in hectares), farming experience (in years), education (in years), family size (in number), non-farm income (in Rs.) and availability of own fund to invest (in Rs.), all being measured in natural logarithmic form. ε is a random disturbance term.

If $G^* > 0$, the farmer is credit constrained. With the above formulation, the probability that the farmer becomes credit constrained ($G^* > 0$) can be written as

$$\text{prob}(G^* > 0) = \text{probability}(\gamma' z + \varepsilon > 0).$$

This formulation leads to a standard probit model to estimate the probability that a household is credit constrained. Assuming ε has a standard normal distribution [$N(0, 1)$], the log likelihood function for a probit model is

$$\ln L = \sum_{G_i=0} \ln(1 - \phi_i) + \sum_{G_i=1} \ln \phi_i$$

where ϕ is the standard normal distribution evaluated at $\gamma' z$ (Foltz, 2004).

RESULTS AND DISCUSSION

Availability of Agricultural Credit

There is an urgent need for increased production in agriculture with a view to attain self sufficiency in food and raw materials. Before the advent of planning in India in 1951, the institutional source of agricultural credit hardly contributed four percent, of which three percent came from co-operatives. The presence of commercial banks in the scene of rural credit was virtually non-existent. The role of commercial banks in the field of rural credit was enhanced significantly following the nationalization of the major commercial banks in 1969 (Malhotra, 1991).

This section studies the availability of agricultural credit in the study area under the following heads.

- Availability of crop loan
- Availability of investment loan

AVAILABILITY OF CROP LOAN

Crop loan is a short term loan meant for production purposes. It is sanctioned for a period of one year for meeting the production expenses connected with raising a crop and to be repaid from the income of the crop raised (Mohideen, 1991). Crop loan requirement includes the credit required to purchase seed, fertilizers, insecticides and pesticides etc.

The farmer category wise and credit constraint wise average per hectare crop loan availability in the study area is shown in table - 1

Table 1: Availability of Crop Loan

Farmer Category	(Rs. per Hectare)	
	CC	CUC
Marginal	4688	24167
Small	14583	35271
Semi medium	13132	17297
Medium	9583	20524
Large	16177	18127

Source: Field Survey, 2006-2007, CC: Credit Constrained Farmers, CUC: Credit Unconstrained Farmers.

Among all categories of farmers, the credit unconstrained farmers had availed higher amount of crop loan per hectare when compared with credit constrained farmers. The credit unconstrained farmers borrowed crop loan in the range between Rs.17297 and Rs.35271 per hectare. The credit constrained farmers had availed crop loan ranged between Rs.4688 and Rs.16177. In all the two groups of farmers, the small farmers had availed higher amount of credit.

AVAILABILITY OF INVESTMENT LOAN

Investment loan is a long term credit to enable the farmers to obtain benefits of agricultural capital goods created or purchased from the loan advanced on tractors, pumpsets, dugwells etc. over a long period of time with a minimum period of three years.

The per hectare availability of investment loan is shown in table – 2.

Table 2: Availability of Investment Loan

Farmer Category	(Rs. Per Hectare)	
	CC	CUC
Marginal	87500	0
Small	17500	17208
Semi medium	7143	7141
Medium	8438	10282
Large	11562	2898

Source: Field Survey, 2005-2006, CC: Credit Constrained Farmers, CUC: Credit Unconstrained Farmers

The table - 2 shows that all categories of credit constrained farmers except medium farmers, had borrowed larger amount of investment credit than credit unconstrained farmers. Among credit constrained farmers, the marginal farmers had availed higher amount of investment credit Rs.87500 per hectare than any other categories of farmers, whereas, the small farmers had borrowed higher amount of investment loan (Rs.17208) among credit unconstrained farmers.

AGRICULTURAL CREDIT CONSTRAINT AND FINANCIAL EXCLUSION

Technology increases the demand for both short term and long term agricultural credit from various institutional agencies. The institutional agencies could not meet the demand for credit. There is, thus a gap between the supply and demand for credit (Shukla et al., 1977).

The agricultural credit constraint and financial exclusion is the excess demand for credit compared to credit availability. The agricultural credit constraint and financial exclusion is classified as

- Crop loan constraint and financial exclusion
- Investment loan constraint and financial exclusion

CROP LOAN CONSTRAINT AND FINANCIAL EXCLUSION

Crop loan constraint is a short period loan constraint. It is the excess demand over availability of crop loan. The crop loan constraint adversely affects the use of farm variable inputs such as labour, seeds, fertilizers, pesticides etc.

The table - 1 shows the farmer category wise distribution of crop loan constraint and financial exclusion.

Table 3: Crop Loan Constraint and Financial Exclusion

Farmer Category	(Rs. Per Hectare)	
	CC	CUC
Marginal	4187	
Small	3847	
Semi medium	6015	
Medium	659	
Large	5478	

Source: Field Survey, 2006-2007, CC: Credit Constrained Farmers, CUC: Credit Unconstrained Farmers

Higher amount of crop loan constraint was observed with the semi medium farmers (Rs.6015) followed by large farmers (Rs.5478). The medium farmers had less crop loan exclusion (Rs. 659), followed by small farmers (Rs. 3847).

INVESTMENT LOAN CONSTRAINT AND FINANCIAL EXCLUSION

Investment loan constraint is a long period loan constraint. It is the excess demand over availability of investment loan. The table shows farmers category wise distribution of investment loan constraint in the high credit intensive Thondamuthur block.

The table - 4 shows, the investment loan constraint and gap in the high credit intensive Thondamuthur block.

Table 4: Investment Loan Constraint and Financial Exclusion

Farmer Category	(Rs. Per Hectare) CC
Marginal	109375
Small	19271
Semi medium	10863
Medium	29270
Large	43556

Source: Field Survey, 2005-2006, CC: Credit Constrained Farmers

The table - 4 shows that in the high credit intensive Thondamuthur block, higher amount of investment loan constraint was observed with marginal farmers (Rs.109375) followed by large farmers (Rs.43556). The lowest amount of investment loan constraint was associated with semi medium farmers (Rs.10863).

DETERMINANTS OF AGRICULTURAL FINANCIAL EXCLUSION AND CREDIT CONSTRAINT

Theoretical and empirical works in economics had established that credit markets in developing countries work inefficiently due to a number of market imperfections which included (1) interest rate ceilings usually imposed by the government; (2) monopoly power in the credit markets often exercised by the informal lenders (Bell et al., 1997); (3) large transaction costs incurred by the borrowers in applying for loans; and (4) moral hazard problems (Carter, 1989). The above imperfections combined together led the farmers to be credit constrained (Foltz, 2004). In this section, an attempt was made to identify the factors which led the farmers to be probable credit constrained and financial exclusion.

A farmer is credit constrained and he has credit gap when he demands more than the availability of credit from the credit institutions. Hence financial exclusion or credit gap is a function of farm and farmer characteristics such as area under cultivation, farming experience, education, family size, non farm income and own fund, affecting both the availability and demand for credit. It leads to the formulation of reduced form model which can be estimated by a probit procedure. The probit procedure was also used by Feder et al (1991) and Foltz (2004), to measure the probability of a farmer being credit constrained and excluded from the institutional finance.

The reduced form estimation shows which factors are more important to either supply or demand. A positive estimated parameter co-efficient signifies a characteristics which increases demand more than supply. Among the variables such as area under cultivation, farming experience, education, family size, non farm income and own fund; non farm income and availability of own fund were expected to have negative relationship with credit constraint and financial exclusion. (Feder et al, 1990). Education, family size, area under cultivation and farming experience were expected to have intermediate a priori sign depending on the strength of its influence on the availability of credit than demand (Feder et al, 1990 and Foltz, 2004).

The estimated financial exclusion and credit constraint equation is shown in table-5.

Table 5: Determinants of Credit Constraint and Financial Exclusion

Variable	Probit Co-efficient	't' Value
Constant	2.7614	2.510**
Area under cultivation	0.6012	2.594**
Farming experience	-0.1832	-0.678
Education	-0.0472	-0.288
Family size	-1.4111	-3.459**
Non farm income	-0.0180	-0.486
Own fund	-0.1587	-5.111**
Chi-squared	46.3850	
Log likelihood function	-59.0428	
Model prediction	75.13	
N	125	

Source: Estimates based on field survey, 2005-2006, **: Significant at 1 percent level

The estimated probit co-efficient showed that among the selected variables, area under cultivation, family size and availability of own fund to invest were statistically significant at one percent level to determine the probability of credit constraint and the probable farmers having financial exclusion. Area under cultivation had positive relationship with financial exclusion. Whereas availability of own fund and family size had negative relationship with the probability of farmers having financial exclusion and credit constraint. The probability of farmers who had financial exclusion had declined along with increase in the availability of own fund and family size. The estimated model prediction was 75.13 percent. It indicates that 75.13 percent of the farmers were correctly classified as credit constrained or credit unconstrained. It showed better fit of the model.

CONCLUSION

To conclude, the marginal and small farmers had availed higher amount of agricultural credit (per hectare) when compared with other categories of farmers.

Higher amount of crop loan exclusion was observed with the large farmers. It is contrary to the theoretical expectation of less availability of agricultural credit to the marginal farmers, when per-hectare availability of credit was considered. It has greater implications for methodological issues to measure financial exclusion. But the investment loan exclusion was observed with the marginal farmers. It was due to the less availability of own fund to invest with them. The probability of farmers who had financial exclusion had declined along with increase in the availability of own fund.

SUGGESTIONS

- The financial exclusion based on absolute availability is a controversial issue. It should be based on the per-hectare availability and demand for credit.
- The allocation of agricultural credit by the lead bank is based on the target oriented approach. The lending approach can be adopted on the basis of potentiality of area rather than target oriented approach.
- The crop loan availed by the farmers did not entirely cover the cost of production. Credit given on the basis of cost of cultivation rather on the basis of scale of finance can reduce the existing crop loan constraint and financial exclusion.
- The scheme formulation in relation to long term investment needs closer attention. The under estimation of cost of investment and farmers' capability to fill the resource gap with their own fund, over optimistic assumptions made in the formulation of scheme for term loan about incremental income and gestation period required to generate this income led the farmers to be credit constrained.

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