

# Nature of Credit Market and Profitability of Farm Households: A Study of Selected States in India

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## Abstract

Farmer households to a large extent depend on credit for financing their production activities. However, the nature of credit market that each household face vary, which in turn impacts the profit. This study based on an in depth analysis of 59th Round National sample survey Organisation data, India (Situation Assessment Survey of Farmers) tries to relate the nature of credit market and profitability of farm households. It is observed that interlinked contracts in credit market (such as loans from trader) yield less profit compared to that of untied contracts. The result has important implication on the distribution of borrower among lenders. It is observed that borrowers generally avail credit from lenders who provides untied credit.

**Keywords:** credit, terms and conditions, accessibility

## 1. Introduction

Agriculture is one of the main sources of livelihood for most households in India. However, households involved in agricultural activities earn less income. Poorer income from agricultural activities may arise primarily due to three reasons: poorer investment, higher cost of production and lower market price. Detailed look on each of these aspects reveal that credit market play an important role in its determination. Poorer investment is contingent on extent of accessibility to credit (see Foster and Rosenzweig, 2010). On the other hand, cost of production and lower market price may largely depend on the terms and conditions of loan. Clearly, a household availing loans at higher rates of interest faces higher cost of production. Similarly, credit from a lender on the condition of selling output at a pre-contracted price (interlinked loans) may yield low rate of return.

However, it is not that credit market contract only determines profit. In fact the profit of the farm households in turn may also determine the type of contract that will dominate in an economy. Stated otherwise, if among the available set of contracts, a particular contract yields the highest rate of return, then majority of the households would try to engage in the contract, which in turn, may determine the type of contract that will dominate.

This paper in this background mainly tries to address two issues. First, does nature of credit market determine profitability of farm? Secondly, the paper looks at whether there is any link between profitability and the type of contract that dominates.

Previous studies (see Gangopadhyay and Sengupta 1987, Chowdhury, 2004) that have linked credit market contract with profitability or income of farm households are mostly theoretical. These studies have mainly argued that interlinked loans, such as a loan from a trader to a farmer, generally fetches lower income (to a farm household) compared to non linked loans such as a loan from a professional lender to a farmer. This is because owing to better information and dealing with the borrower in credit and output market, the trader can push the borrower at his/her reservation utility level, which is not possible for other lenders (see Chowdhury, 2004). We try to address this issue empirically, which to the best of our knowledge has not been studied. In addition, studies that have addressed the issue of distribution of borrowers among lenders (see Ray and Sengupta, 1989) have mainly provided a supply side explanation behind distribution. According to these studies, information advantage of one supplier over another determines distribution of borrowers among lenders. These studies have therefore undermined borrower's preferences in determination of distribution of borrowers across lending agencies. We however show that borrower's profit play a major role in determination of distribution of borrowers among lender.

The paper utilizes 59<sup>th</sup> round 'Situation Assessment Survey of Farmers' data provided by National Sample Survey Organisation. The data set provides information pertaining to assets, income, indebtedness, consumption, access to resources, farming practices and access to modern technology of 51770 farmer households across 6638 sample villages across the country. However, our present analysis considers only five states, namely Punjab, West Bengal, Maharashtra, Andhra Pradesh, and Assam. For selecting the states, we have subdivided the entire economy into five parts: northern region, eastern region, north eastern region, western region and southern region. One state was selected from each region. To address the issue in a detailed way, the paper also carries out an econometric analysis. However this has been restricted only to farmers engaged in paddy production. This is because nature of credit market that a borrower faces may vary according to crops.

The paper is subdivided into the following sections. The next section provides a brief overview of the nature of credit market. Econometric analysis is carried out thereafter. A concluding section is presented at the

end.

## 2. Nature of credit market: A Brief Overview

In India, accessibility to credit and terms and conditions of loan generally differ across lenders. One can segregate the lenders who provide credit to households into four categories. These are informal professional lenders, informal traders, relatives/friends and formal lending agencies. The formal lending agencies consist of commercial banks, cooperative banks, or other government agencies which are regulated by the government. The professional lenders are those with whom the borrower is linked only in the credit market. Pawn brokers or jewellery shop are good examples of it. On the other hand, traders are linked to the borrower in both credit and trading market. Relatives and friends generally provides loan at zero rates of interest.

To look into the nature of credit market that a borrower faces, we start with figures on *incidence of indebtedness (IOI)*. Incidence of indebtedness is defined as percentage of households who were indebted on a particular date. This indicator is generally used to measure percentage of households possessing accessibility to credit (see Dev, 2006 and Basu, 2006). Using figures on IOI one finds that indebtedness is more among households of Andhra Pradesh, while it is less among households of Assam. If incidence of indebtedness is defined as accessibility to credit, one needs to look whether this difference in accessibility is a result of poorer supply of credit from formal sources or is it also depends on supply of loan from informal sources.

Table 1 Incidence of Indebtedness as on date of survey

Andhra Pradesh	82.53
Assam	18.17
Maharashtra	55.29
Punjab	65.70
West Bengal	50.78

Source: Computed by the author using 59<sup>th</sup> Round NSSO *Situation Assessment Survey of Farmers* data

Table 2 in this regard provides the distribution of IOI according to source of loan. Two important features are observed from table 2. First, higher incidence of indebtedness depends on both development of formal and informal credit market. For instance, from table 2 one observes that households of Andhra Pradesh borrow both from formal and informal sources. Secondly, it is observed that moneylender and formal lending agencies are the two main sources of credit for households in most of the states considered in our analysis except for West Bengal and Assam. If availing of loan from a particular source is not an imposition, table 2 implies that borrowers in general prefer professional moneylenders over a trader, except for the state of West Bengal and Assam. This may happen either if availing a loan from professional lender is cheaper, or it may happen if the farmer households do not possess access to credit from lenders such as traders. Our paper now explores the dominant reason behind availing loan from a professional lender in most states.

Table 2 Incidence of Indebtedness according to Source of Loan as on Date of Survey

State	Source of Loan			
	Formal	Moneylender	Trader	Others
Andhra Pradesh	41.42	46.82	7.43	9.30
Assam	2.73	1.77	3.05	11.07
Maharashtra	46.76	4.08	3.31	8.76
Punjab	34.09	18.19	11.70	15.64
West Bengal	24.81	7.76	14.70	13.84

Source: Computed by the author using 59<sup>th</sup> Round NSSO *Situation Assessment Survey of Farmers* data (Note: A household can avail loan from two sources)

When one looks into the rate of interest charged by different lenders (which gives an indication about cost faced by borrower), one finds that moneylenders generally charges higher interest rate compared to other lending agency (see table 3). Thus if one considers rate of interest as the only cost component, lower cost of lending would not provide an explanation behind dominance of professional lenders in most states. On the other hand argument in terms of absence of accessibility to credit from traders may not hold true because we observed from the data that traders generally provides loan to poorer households (who generally possesses lower accessibility to credit) and the size of the loan is relatively small compared to a formal or a professional lender. For instance while average size of loan provided by a trader in all the states under consideration is Rs. 7396, the size of loan provided by professional lenders and formal lending agencies are Rs. 19219 and Rs. 21791 respectively. Thus, for richer household loans from trader may not be sufficient for carrying out production.

Table 3 Percentage of loans existing below 15 percent interest rate according to source of loan

States	Formal	Moneylender	Trader	Others
Andhra Pradesh	79.49	7.25	28.88	23.96
Assam	84.18	77.73	91.95	92.60
Maharashtra	43.21	27.84	86.49	77.21
Punjab	96.93	14.66	68.23	79.42
West Bengal	93.84	51.05	94.34	89.00

Source: Computed by the author using 59<sup>th</sup> Round NSSO *Situation Assessment Survey of Farmers* data (Note: A household can avail loan from two sources)

However, when compares the average profit faced by farm households with type of lender from whom a household has availed loan, one finds that in Punjab, Andhra Pradesh and Maharashtra average profit is less if loans are availed from traders, compared to that of professional moneylenders (see table 4). On the other hand, in West Bengal and Assam, the average profit is relatively low, if a borrower avail loan from a professional lender (see table 4). If one compares the result, obtained from table 4 with that of table 2, one finds that within a region borrower has a tendency to avail loan from that lending agency, where profit is higher.

Table 4 Average profit per hectare of land in selected states of India

Lenders	Punjab	West Bengal	Maharashtra	Andhra Pradesh	Assam
Formal	22290.0	10987.8	13105.6	12828.7	12972.7
Moneylender	17473.8	7723.6	15488.0	10217.6	10620.7
Traders	14849.0	8146.9	10024.0	2190.4	11108.6
Others	20652.4	11021.9	10735.2	11353.8	16821.3

Source: Computed by the author using 59<sup>th</sup> Round NSSO *Situation Assessment Survey of Farmers* data (Note: A household can avail loan from two sources)

However, from these tables one cannot say whether lower profit is due to poorer loan size or is it due to unfavourable terms and conditions. To look into this aspect in detail way, we have considered a regression analysis in the next section.

### 3. Regression analysis

In this section we want to find out the determinants of profit of farm households. After controlling different factors that may impact profit, we want to see the role of credit market contract in determination of profit. For this we carried out an ordinary least square regression where profit of the household is the dependent variable. On the other hand, at the explanatory part we have considered variables representing household characteristics, regions and credit market terms and conditions. Our regression analysis is confined only to farmers involved in production of paddy.

#### 3.1 Explanatory Variables

##### 1. Household characteristics

We have considered two household specific variables in the explanatory part. These are education of the household and size of the land owned by the household. It is expected that education and land would positively influence profit since this has positive impact on accessibility to credit. Moreover education is expected to provide better knowledge about farming practices. In our analysis, education is captured by a dummy variable. If the highest education of the household is more than secondary level, a household has been assigned the value 1; zero value has been assigned otherwise.

##### 2. Credit market Terms and Conditions

Credit market terms and condition is one of the major components of cost of producing output. In the regression analysis the following variables are captured to represent terms and conditions of loan. First of all we have considered interest rate faced by household as one of the variables. Lower interest rate is expected to reduce cost of production. Secondly, the security used for availing loan is one of the important factors that determine profit. If the security given by the household is of higher value then the household would put more effort in repayment and producing output, since a default in such a case would lead to higher loss (see also Bhaduri, 2006). In this context one should note that in informal credit markets collaterals are highly undervalued. This in turn transfers the risk of default from lender to the borrower. This is because presence of undervalued collateral would make default costlier for a borrower compared to repaying back the loan amount. In the regression part to capture this impact, a dummy variable has been considered. If a household has used land as collateral, a value 1 is given; zero value has been assigned otherwise. This is because loss of land would mean loss of a permanent source of earning income.

To capture the impact of interlinked contract on profit of farms, we have used a dummy variable. Keeping relatives/friends and farming by self financing as the base category, three dummies were introduced.

Loans from traders are expected to be tied loans. Apart from traders we have considered professional moneylender as one category.

Size of the loan may impact profit in a negative way. This is because borrowing increases cost of production when compared to self financing.

In addition, we have also considered the period of loan as one of the explanatory variable. If period of loan is more than 1 year, a value 1 has been assigned to the household. Households availing loans for longer period would provide less effort n producing.

### 3. Regional Factors:

Since productivity may differ across regions, we have assigned a dummy variable to each state. In the analysis, Assam has been considered as the base category.

## 3.2 Regression Results

An ordinary least square regression was carried out to find out the determinants of profit of farm households. The list of variables used along with the notations is presented in table 5, while the results are presented in table 6.

Table 5 Descriptions of variables with notation used in the regression table

Dependent Variable = Profit	Description of variables
Education (Dummy)	Highest Education of the household above secondary =1 , others = 0
Andhra Pradesh (Dummy)	Andhra Pradesh = 1, other states = 0
Maharashtra (Dummy)	Maharashtra = 1, other states = 0
Punjab (Dummy)	Punjab = 1, other states = 0
West Bengal (Dummy)	West Bengal = 1, other states = 0
Formal (Dummy)	Formal = 1, other lenders = 0
Trader (Dummy)	Trader = 1, other lenders = 0
Moneylender (Dummy)	Professional Moneylender = 1, other lenders = 0
Loan Period (Dummy)	loan provided above I year =1, others 0
Security (Dummy)	Land is used as security = 1, other security = 0
Interest rate	Rate of interest charged
Loan size	Size of the loan
Land Owned	Land possessed by the household
Constant	Constant term in regression

Source: Computed by the author using 59<sup>th</sup> Round NSSO *Situation Assessment Survey of Farmers* data

Most of the coefficients of the variables used in the regression have shown expected sign. It is observed that if land is used as collateral to avail loan, a household realizes higher profit. Thus use of land as collateral increases household effort and thereby increases output. In this context, one should, however, note that apart from land, if crop is used as collateral then the household may lose bargaining power in the output market, which may lead to low price and reduction in profit.

Table 6 Regression Results (Ordinary Least Square Regression)

Number of observations = 7309, F( 13, 7295) = 85.33, Prob > F = 0.0000, R-squared = 0.5234 Root MSE = 16174

Dependent Variable = Profit	Coefficients	Robust		t values	P> t
		Standard Errors			
Education	-1464.5***	645.9		-2.3	0.0
Andhra Pradesh	-2518.0***	613.7		-4.1	0.0
Maharashtra	-5395.7***	611.5		-8.8	0.0
Punjab	15501.7***	2536.9		6.1	0.0
West Bengal	-3246.8***	457.8		-7.1	0.0
Formal	-248.6	764.2		-0.3	0.7
Trader	-2844.1***	810.0		-3.5	0.0
Moneylender	-2256.1***	777.9		-2.9	0.0
Loan Period	-1355.3***	545.4		-2.5	0.0
Security	1668.0***	808.9		2.1	0.0
Interest rate	-4.9	4.8		-1.0	0.3
Loan	0.0***	0.0		-2.0	0.0
Land Owned	13.6***	0.9		15.0	0.0
Constant	2670.6***	691.9		3.9	0.0

Loan size is observed to be negatively related with the dependent variable. This implies for a given rate of interest if size of the loan goes up, cost of production also increases. In the regression analysis one also observes a positive relation between size of the land and profit of the household. In other words, larger size of land provides better provisions for making investment and thereby it leads to higher profit.

As far as the relation between type of lender and profit is concerned, we observed that availing loan

from trader fetches lower profit as compared to professional lender. Thus due to advantage of simultaneous operation in credit and trading market, trader can always push a farmer to lower levels of profit, which is not possible for other lenders. One also observes that profit level does not significantly vary between loans availed from formal lending agency and relatives and friends.

The regression results presented in table 6 gives some unexpected signs. It is observed that education is negatively related to profit of farm households. It may happen that education separates a household from farming and therefore households having better educated members are poor in farming.

As far as the regional variables are concerned, it is observed that Punjab is having higher profit than other states considered in the analysis.

#### **4. Concluding Remarks**

The paper relates profitability with credit market terms and conditions. Certain interesting results are observed. One finds that profitability is more if loans are availed from formal lending agencies and professional moneylenders compared to that of trader. One should note that professional lender generally charges higher interest rate. Thus interlinked deals, which reduce the bargaining power of borrowers, may be one important reason behind realisation of lower profit.

The paper also looks at the relation between borrower's profitability with distribution of borrowers among lenders. It is observed that in a region borrower generally avails credit from that lending agency that yields higher profit.

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