



Determinants of Access to Rural Credit

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Abstract

Credit rationing is an inherent characteristic of the institutional and non-institutional credit market. There are two types of credit rationing in the credit market. In the former type, the borrower is refused access to institutional credit irrespective of whether he has fulfilled the specified terms and conditions. In the latter instance, a rural household may borrow, but not to the extent it desires or requires. This paper aims to investigate the household characteristics that influence initial access to the credit market. The paper also examines household characteristics which influence the degree of accessibility, measured in terms of the quantity of loans received. This is done using primary data from Bihar. Self-cultivated area and distance of the household from a metalled road affect initial credit market access. The literacy of household head, land ownership, and distance from a metalled road influence the quantity of loan secured. The social category of the household impacts both credit market access and loan amount secured.

Keywords: Access to credit, credit rationing, amount borrowed.

Introduction

Agricultural credit is critical to the development and modernisation of the agriculture sector. The supply of timely and adequate credit is crucial in the process of agricultural production. A household demands credit for buying fixed capital such as land and machines to expand existing agricultural production. Credit is needed to purchase inputs or working capital to carry out production activities. Credit is also demanded to fulfil the consumption needs of the farmers. In addition, unforeseen occurrences such as sickness or weddings create an urgent need to borrow. Credit availability reduces the reluctance to implement technologies that increase the mean level of income (Rosenzweig and Binswanger, 1993). Thus, the credit market influences output, investment and technology adoption in the economy.

After independence, the Government worked to broaden the scope of formal credit services (Kumar et al., 2015). Despite considerable government efforts to improve the accessibility of formal credit, a large proportion of credit transactions in undeveloped nations continue to occur in the informal credit market. Despite the working of the formal and informal credit markets, households may experience credit constraints due to the rationing of credit by these institutions.

There are two types of credit rationing in the credit market. In the former type, the borrower is refused access to institutional credit irrespective of whether he has fulfilled the specified terms and conditions. In the latter instance, a rural household may borrow, but not to the extent it desires or requires. The second instance takes into consideration differential credit flows.

Credit rationing occurs in the institutional credit market for various reasons. The interest rate charged by the institutional sources of credit is lower than the non-institutional sources of credit. The provision of subsidised loans by the formal credit institutions has led to excess demand for the formal credit than supply, resulting in credit rationing. As the rationed credit is limited, loans are usually approved based on political processes (Shami, 2019) or captured by the elites (Bardhan and Mookherjee, 2012).

Institutional lenders operate under a regulated and structured framework. They are not permitted to charge a premium above the nominal interest rate. To compensate for the significant screening costs and the risk of default, they may choose to pass on the transaction costs of screening borrowers and drafting a credit contract to debtors (Guirkinger and Boucher, 2008). According to a study, the interest rate charged by the commercial bank is 12 per cent and negotiating a loan from a commercial bank in India takes an average of 33 weeks (Basu, 2006). Transaction costs of obtaining formal credit, including out-of-pocket expenses, payments to intermediaries, and the opportunity cost of wage loss, can be as high as 17 to 22 per cent of the loan obtained from a commercial bank (Mahajan and Ramola, 1996). The interest rate charged by the commercial bank is low, but the monetary cost of obtaining the formal credit includes the interest rate and the transaction cost borne by the borrower. The total monetary cost of formal credit is significantly higher. When the total monetary cost of obtaining a formal loan exceeds its monetary benefits, households may be transaction cost rationed from utilising formal credit facilities (Pal, 2014).

When the institutional credit market is unable to meet the borrowers' needs, the surplus demand spills over to the non-institutional, or informal credit market. However, credit is also rationed in the non-institutional credit market. In the informal credit market, credit may be rationed due to the informational problems of moral hazard and adverse selection (Stiglitz and Weiss, 1981). Monitoring by creditors may fail if highly indebted borrowers lose the incentive to work hard since a considerable amount of the return is used for repayment of the loan. In this situation, high interest rates create a debt-overhang problem, and informal lenders may not be able to raise the interest rate above a crucial level. Besides, the informal lenders have limited funds, and not all potential borrowers may be able to obtain credit.

In the presence of credit rationing in both the formal and the informal credit institutions, several households are unable to access credit facilities. When they do have access to credit through the credit market, it is sometimes limited in terms of quantity. The purpose of this paper is to investigate the household characteristics that influence initial access to the credit market. The degree of accessibility is measured in terms of quantity of loan received. This was accomplished using primary data from Bihar.

Database and Econometric Method

The state of Bihar has always lagged in economic and social development. Access to credit is another area in which Bihar lags behind other states. According to the All-India Debt and Investment Survey, 2013, the incidence of indebtedness (IOI) is merely 29.08 per cent in Bihar, meaning that only 29 out of 100 households have borrowed. To understand the determinants of access to credit, we collect micro-level data through field surveys in rural Bihar.

The field survey for this study was conducted in Arwal and Rohtas districts. These two districts are selected based on four indicators. The indicators used for selecting the districts are the percentage of villages electrified in the district, number of bank branches per lakh district population, gross irrigated area in the district and productivity of paddy. Rohtas is among the top three districts, and Arwal was among the bottom in three out of four indicators. Therefore, Rohtas represented a developed district, and Arwal represented an underdeveloped district. These two contrasting agro-economic districts are chosen to observe the differences in their rural land, labour and credit markets.

In Arwal and Rohtas district, 4 blocks are surveyed. The blocks are chosen from Census (2011) data in such a manner that they represent the overall characteristics of the districts. The blocks selected from the Arwal district are Kurtha and Sonbhadra Banshi Suryapur, and the two blocks selected from Rohtas District are Dehri and Tilouthu.

Two villages from each block and four villages from each sample district are surveyed. The survey covers a total of eight villages. 50 households from each village, and a total of 400 households are selected. The villages are selected to represent the overall characteristics of their blocks and districts. Villages Sachai and Pratappur are selected from the Kurtha block. Villages selected from Sonbhadra Banshi Suryapur block are Gonpura and Pondil. Sidhauri and Sanath Bigha are the villages surveyed from Dehri. Villages Hurka and Lewara are chosen from the Tilouthu block.

During the village survey, we prepared a list of all the households and their land in consultation with key informants in the village. The households were categorised based on the amount of land they held. The categories of the households according to the land owned are (i) agricultural labourers (landless), (ii) marginal farmers (owning 0.01 - 2.49 acres of land), (iii) small farmers (owning 2.50 - 4.99 acres of land), (iv) medium farmers (owning 5.00-7.49 acres of land) and (v) large farmers (owning 7.50 acres and above). After compiling the entire list, households are selected from it for the collection of micro-level data.

We sampled 50 households from each village to represent the five landownership categories. The number of households to be surveyed in each land ownership category is determined through disproportionate stratified sampling. The probability of each household being selected is proportional to the size of its stratum. The fieldwork was done from July 2019 to December 2019. The collection of data from the households was done by conducting personal interviews with a structured questionnaire.

When the dependent variable is dichotomous, probability models are conceptually better than linear probability regression models because parameter estimates of the former overcome the majority of the shortcomings of linear probability models. They provide efficient and asymptotically consistent parameter estimates.

A Probit model has been used to examine the determinants of access to credit for the household. The model is a binary choice model in which the probability of access to credit (y) is estimated as a function of a vector of explanatory variables (x). We assume that the response variable y_i^* that is described by the regression relationship:

$$y_i^* = \beta'x_i + u_i$$

In reality, y_i^* is not observable, but we observe the dummy variable y , which is defined as follows:

$$y = 1 \text{ if } y_i^* > 0 \text{ (access to credit)}$$

$$= 0 \text{ otherwise (no access to credit)}$$

As a result of the above relations, we obtain:

$$Prob (y_i = \text{access to credit}) = Prob (u_i > -\beta'x_i)$$

$$= 1 - F(-\beta'x_i)$$

The cumulative distribution function for u is denoted by F . The likelihood function is:

$$L = \prod_{y=0} F(-\beta'x_i) \prod_{y=1} [1 - F(-\beta'x_i)]$$

The ML estimator of slope coefficient is obtained by taking the logarithm of L and maximising with respect to b .

The determinants of the quantity of credit accessible are obtained using a sub-sample of households that have access to credit. While this may result in sample selection bias, Heckman (1979) proposed a joint maximum likelihood approach to correct this effect. The procedure includes estimating the probability of obtaining access to credit and then estimating the quantity of credit obtained.

This procedure involves identifying the access to credit equation, and non-farm income, land self-cultivated by the household, the social category to which the household belongs and distance of the village in which the household is located from the pucca road have been chosen as the appropriate variables. However, rural households with access to credit do not represent a random sample of all rural households in the population. Heckman (1979) proposed a solution to this problem (two-step procedure), and this solution variable (inverse mills ratio or λ) will be included as an explanatory variable in the access to credit function to account for the selectivity bias. To formalise the above explanation, consider the following equation that determines sample selection:

$$I_i^* = \gamma'Z_i + u_i$$

And let the principal interest equation (determinants of quantity of credit obtained) be as follows:

$$y_i = \beta'x_i + \varepsilon_i$$

The sample selection rule is that only when i is greater than zero is y observed. Additionally, if ε and u have a bivariate normal distribution with a mean of zero and a correlation coefficient of ρ , we can formulate the model as:

$$E[y_i | y_i \text{ is observed}] = E[y_i | I_i^* > 0]$$

$$= E[y_i | u_i > -\gamma'Z_i]$$

$$= \beta'x_i + E[\varepsilon_i | u_i > -\gamma'Z_i]$$

$$= \beta'x_i + \rho\sigma_\varepsilon\lambda_i(\alpha_u)$$

$$= \beta'x_i + \beta_\lambda\lambda_i(\alpha_u)$$

Where,

$$\alpha = \frac{\gamma'Z_i}{\sigma_u} \text{ and } \lambda(\alpha_u) = \frac{\phi(\gamma'Z_i/\sigma_u)}{\Phi(\gamma'Z_i/\sigma_u)}$$

$$Y_i | I_i^* > 0 = E[Y_i | I_i^* > 0] + V_i$$

$$= \beta'x_i + \beta_\lambda\lambda_i(\alpha_u) + V_i$$

Least squares regression on observable data—for example, ordinary least squares regression on credit determinants using only data from households who have access to credit—yields inconsistent estimates of β . This problem is a case of an omitted variable. Thus, the least square regression of y on x and λ produces consistent estimates, but omitting λ commits the specification error associated with the omitted variable. Heckman suggests a two-stage procedure based on this observation. Probit regression is used to estimate the discrete choice model on the complete sample in the first stage. Using the estimates of the probit regression, the lambda (λ) is calculated, which is included in the second-stage estimates of the structural relationship of non-censored observations on the selected sample.

Credit Market in the Study Area

Out of 400 sampled households, 227 households did not report any credit transaction. A total of 173 households have taken loans from one or more sources. Thus, a total of 43.25 per cent of households were indebted. Small, medium and large farmers get more loans from institutional sources than landless labourers and marginal farmers, while landless labourers and marginal farmers depend more on non-institutional sources. The average loan amount from the institutional and non-institutional sources increased with farm size.

Table 1: Distribution of Loans by Farm Size

	Landless Labourers	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total
Percentage of indebted households among total households	41.09	43.75	42.19	44.12	61.54	43.25
Percentage of indebted households who borrowed only from institutional sources	28.30	35.71	74.07	60.00	75.00	43.35
Percentage of indebted households who borrowed only from non-institutional sources	50.94	42.86	22.22	26.67	12.50	39.31
Percentage of indebted households who borrowed from institutional and non-institutional sources	20.75	21.43	3.70	13.33	12.50	17.34
Average amount in ₹ borrowed from institutional sources	16538	46700	76286	132727	148571	60952
Average amount in ₹ borrowed from non-institutional sources	20645	28421	48929	53333	55000	28938

Source: Field Survey

Determinants of Access to Credit

Dependent Variable:	
LoanYN	=1 If loan from formal or informal institutions was borrowed by the household, =0 otherwise
Explanatory Variable:	
NonFarmInc	Income accruing to the household from sources other than farming and allied activities.
Self_Cultivated	Land self-cultivated by the household (in acres).
General	=1 for the household that belongs to the General category, =0 otherwise.
OBC	=1 for the household that belongs to the OBC category, =0 otherwise.
IsolatedVillage	=1, when the household is located in a village more than 10 km from the pucca road, =0 otherwise.
IMR(λ)	Inverse Mills Ratio

Households with more land have higher farm income and may have greater access to the credit market. Households with more non-farm income may also have greater accessibility to the credit market. The historically entrenched caste system substantially influences the economic position of people of various strata in rural society. The weaker sections of society have difficulty in

accessing both the formal and the informal credit market. We, therefore, analyse the difference in access to credit for the General, OBC and SC social groups. Households located in isolated villages may not have difficulty accessing informal credit as informal lenders are most frequently located within the village, but accessing the formal credit market is difficult for them.

Table 2: Access to Credit: Probit Results

Variables	Coef.	Std. Err.	
Intercept	0.10772	0.13443	
NonFarmInc	0.00000	0.00000	**
Self_Cultivated	0.08672	0.03171	**
General	0.54791	0.23966	.
OBC	0.23343	0.16032	
IsolatedVillage	0.46969	0.19950	*
LR Chi-square (5 df)	28.71		
Pseudo R-square	0.0518		
No. of observations	400		

P values: 0 ‘***’, 0.001 ‘**’, 0.01 ‘*’, 0.05 ‘.’, 0.1 ‘’

Accessibility to credit for a household increases as the amount of land it cultivates grows. Households belonging to the General and OBC categories have more access to credit than the households belonging to the SC category. Households of isolated villages located farther away from metalled roads have greater access to credit as compared to households of villages located near the metalled road.

Determinants of Quantity of Credit Obtained

The dependent variable is the log of the total loan amount borrowed by the households from both institutional and non-institutional sources of credit. The value of the loan amount borrowed measures the actual accessibility of credit for the households, as some households might be able to borrow a meagre amount but not enough to meet their entire needs. Table 3 examines the factors that influence the quantity of credit borrowed by rural households.

Dependent Variable:	
LogLoanamt	Log of the loan amount (in ₹) borrowed by the household
Explanatory Variable:	
LiteracyHead	Years of formal schooling received by the household head.
LandOwned	Land owned by the household (in acres).
General	=1 for the household that belongs to the General category, =0 otherwise.
OBC	=1 for the household that belongs to the OBC category, =0 otherwise.
IsolatedVillage	=1, when the household is located in a village more than 10 km from the pucca road, =0 otherwise.
IMR(λ)	Inverse Mills Ratio

Land possessed by the borrowing household and education of the household can be expected to have a positive association with the amount of credit accessible to the households. Caste can also affect the accessibility of credit. Location and connectivity of the households play an essential role in the accessibility to markets. As a result, the location may also influence a household's access to the credit market.

Table 3: Determinants of Credit Obtained: Selectivity Corrected OLS Results

Variables	Coef.	Std. Err.	
Intercept	8.18588	0.66407	***
LiteracyHead	0.05719	0.02432	*
LandOwned	0.27044	0.06146	***
General	1.09551	0.58721	.
OBC	0.14170	0.32134	
IsolatedVillage	-0.64314	0.42147	***
IMR(λ)	1.636495	0.79104	* ¹
Rho	0.82618		
Sigma	1.9807946		
No. of obs	173		
Wald chi2(5)	43.53		
Prob > chi2	0.00		

P values: 0 '***', 0.001 '**', 0.01 '*', 0.05 '.', 0.1 ''

Loans are provided to households based on land they possess as land serves as collateral for the lenders. Therefore, landholding patterns have an effect on credit accessibility. A positive value of the *Land Owned* coefficient indicates that households with more land can borrow a larger amount from the rural credit market. The results help us re-emphasise that land ownership enables landowners to exert influence on other rural institutions such as the credit market (Mearns, 1999).

Credit accessibility is influenced by the level of education of the household head. As indicated by a positive value of the coefficient *Literacy Head*, heads of households with a higher level of education can borrow a greater amount of loans from the rural credit market than their less-educated counterparts.

A positive value of *General* and *OBC* coefficients shows that households belonging to the General and OBC social category can borrow a greater amount of loan than the households belonging to the SC social category. A negative value of the coefficient *isolated village* indicates households located farther away from metalled roads receive a lower amount of credit than villages located near a metalled road. Therefore, the accessibility of the credit markets in terms of the amount of loan borrowed by the households is determined by their location.

¹A significant IMR suggests that the selection term was omitted from the OLS, thus we have rightfully included the solution variable (λ) as an explanatory variable in the determinants of credit obtained function to account for the selectivity bias.

Conclusion

As the supply of credit in both the formal and the informal credit market is less than the demand, certain household characteristics facilitate better access to the credit market. Area self-cultivated by the household and the distance of the village in which the household is located from a metalled road positively influence initial access to the credit market. Literacy of the household head and land owned by the household positively affects the amount of credit obtained from the credit market, and the distance of the village in which the household is located from a metalled road negatively impacts the amount of credit received. The caste to which the household belongs affects both initial access and the amount of loan secured from the credit market, with households belonging to the General and OBC categories in a more favourable position than those in the SC category.

The study has important policy implications. The credit market institutions, particularly the formal credit market institutions, should promote financial literacy to overcome the obstacles provided by the prospective borrowers' level of education. Land continues to be the principal type of collateral, which limits the access of poor rural including SC households to formal and informal credit. Lending procedures should be simplified and supply of credit should be increased so that credit is accessible to households that require it.

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