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Factors Affecting on loan Repayment Performance of Farmers in Khorasan-Razavi Province of Iran

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Abstract

This study investigated the factors influencing on repayment behavior of farmers that received loan from agricultural bank by using a logit model and a cross sectional data of 175 farmers of Khorasan-Razavi province in 2008. Results showed that loan interest rate is the most important factor affecting on repayment of agricultural loans. Farming experience and total application costs are the next factors, respectively.

Keywords: credit, agricultural bank, marginal effect, Logit model

Introduction

Agricultural lending involves giving out of credit (in cash and kind) to small- scale farmers for the purpose of farming. There is no doubt about the crucial roles of credit in economic development. Agricultural household models suggest that farm credit is not only necessitated by the limitations of self-finance, but also by uncertainty pertaining to the level of output and the time lag between inputs and output. Recent studies show the growth rate of investment in agriculture is less than other economic sector. So financing agriculture is one of the most important factors to develop rural areas in developing countries. Banking system payment is a way of financing. Generally, credit accessibility is important for improvement of quality and quantity of farm products so that it can increase farmer's income and reduce rural migration.

In the other hand, Lending is a risky enterprise because repayment of loans can seldom be fully guaranteed. Generally In spite of the importance of loan in agricultural production, its acquisition and repayment are fraught with a number of problems especially in the small holder farming

(Awoke, 2004). It is reported in empirical studies that large rate of default has been a perennial problem in most agricultural credit schemes organized or supported by governments. Most of the defaults arose from poor management procedures, loan diversion and unwillingness to repay loans. For this reason, lenders devise various institutional mechanisms aimed at reducing the risk of loan default (pledging of collateral, third-party credit guarantee, use of credit rating and collection agencies, etc.). In the context of providing credit to the rural asset-poor, what is required is institutional innovation that combines prudent and sustainable banking principles with effective screening and monitoring strategies that are not based on physical collateral (such as land). Recent theoretical and empirical work in economics has established that credit markets in developing countries work inefficiently due to a number of market imperfections. The literature cites a number of market imperfections which lead to loan default. These imperfections include:

- 1) Interest rate ceilings usually imposed by the government
- 2) Monopoly power in credit markets often exercised by informal lenders (Bell et al., 1997)
- 3) Large transaction costs incurred by borrowers in applying for loans
- 4) Moral hazard problems

Koopahi and Bakhshi (2002) used a discriminant analysis to identifying defaulter farmers from non-defaulters of agricultural bank recipients in Iran. Results showed that use of machinery, length of repayment period, bank supervision on the use of loan had significant and positive effect on the agricultural credit repayment performance. In the other hand incidence of natural disasters, higher level of education of the loan recipient and length of waiting time for loan reception had a significant and negative effect on dependent variable. Deng et al. (1996) developed an empirical, option-based model of homeowner's default behavior, in a proportional hazard framework. These authors simulate probabilities of default and default costs on zero-down payment loans and then compare the results with conventional underwriting standards. They estimate that, if low-income borrowers are enticed by zero-down payment requirements and if no adjustment for the higher default rates is made, the cost of the implicit subsidy would amount from \$74,000 to \$87,000 per million dollars of lending. Quercia et al. (1995) show that a lower loan-to-value (LTV) ratio at the time of origination (i.e., higher down payment) leads to lower default rates for rural, low-income borrowers. These authors focus on the 1981 Farmers Home Administration Section 502 program and show that, while contemporaneous equity value in rural low-income mortgage loans is not associated with default, crisis events are. Van Order et al. (2000) find, however, that the default behavior of both low- income and average-income groups is responsive to negative contemporaneous equity, while default rates and default losses are higher for low-income borrowers. Moreover, the influence on credit risk of individual and neighborhood income is small for LTV less than 80 percent, but it ranges from 15 up to 50 basis points for very high LTV ratios. Enticing low-income mortgage borrowers with lower down payment requirements thus increases the risk of default. Oladebo (2008) examined socio-economic factors influencing loan repayment among small scale farmers in Ogbomoso agricultural zone of Oyo State of Nigeria. Results of multiple regression analysis showed that amount of loan obtained by farmers; years of farming experience with credit use and level of education were the major factors that positively and significantly influenced loan repayment. A main strategy of governments in developing countries like Iran is help to develop the rural areas and increase agricultural production through investment in the sector, so farmer's access to credit and direct to productive investment projects seems to be required. One of the Iranian financial institutes that play an important role in financing agriculture sector is Agricultural Bank. This bank is the main institutions of formal agricultural credit supply in Iran that can direct agricultural credit flow such that helps general economic policies of government. So duty of agricultural bank includes financing farmers and related industries and participation in activities which private sector can't invest in it. A main part of financial resources of Agricultural Bank comes through recovery of overdue granted credits while lending activity for banking system is accompanied with some risks and problems. Although in Khorasan-razavi

province of Iran, 64 percent of total credit demand of farmers in 2006 is covered by agricultural bank but it is not investigated how received credit has been repaid and which factors influencing on repayment behavior of farmers. Thus in this study, in order to adopt further proportional policies, the role of socio-economic factors in repayment behavior of farmers for last received loan from agricultural bank has been identified.

Research methodology

A logit model is used to find the factors influencing on loan repayment performance. Dependent variable is defined as whether farmers had delayed repayment of loan installments to bank. Hence, If farmer had not any delayed repayment, value of dependent variable will be one and otherwise zero. Study was done by collecting data through a survey and filling questionnaires for 175 farmers in rural regions of Khorasan-Razavi province of Iran.

Independent variables include:

X1= age of respondent

X2= farm land hectares

X3= experience of respondent

X4=income of respondent

X5= interest rate of received loan

X6= time laps between loan application and disbursement

D1= whether respondent used loan for investment activity (yes=1, no=0)

X7= total application costs

D2= whether respondent owned farm machinery (yes=1, no=0)

X8= loan size

X9= collateral value

X10= Number of installments for which the loan is due for repayment.

The logit model for repayment performance expressed as:

$$Y = \beta_0 + \beta_i X_i + e_i \quad (2)$$

Where Y is dichotomous dependent variable which can be explained as;

$Y = 1$, if farmer had not a delayed repayment of loan installments, and $Y = 0$, otherwise.

Logit model limits probabilities for each values of dependent variable between 0 and 1.

Marginal effect of independent variables indicate probability variation of being in group if changes one unit.

$$ME = \frac{\partial P_i}{\partial X_i} = \frac{e^{\beta'X_i}}{(1+e^{\beta'X_i})^2} \beta_i \quad (3)$$

Elasticity of dependent variables is calculated as:

$$E_{x_i} = \frac{\partial \Lambda(\beta'X_i)}{\partial X_i} \frac{X_i}{\Lambda(\beta'X_i)} = \frac{e^{\beta'X_i}}{(1+e^{\beta'X_i})^2} \frac{X_i}{\Lambda(\beta'X_i)} \quad (4)$$

Where shows elasticity of ith variable and represents logistic cumulative distribution function.

Results and discussion

The results of the determinants of loan repayment by the Khorasan-razavi farmers are presented in table 1:

Table 1- logit estimation results

Variable definition	coefficient	t statistic	Aggregated weighted elasticity	Elasticity at mean	Marginal effect
X ₁	-0.020	-0.904	-0.4948	-0.680	-0.004
X ₂	-0.026	-1.439	-0.089	-0.144	-0.005
X ₃	0.034	1.801*	0.489	0.680	0.007
X ₄	0.309	3.465**	0.175	0.223	0.065
X ₅	-0.118	-4.391**	-0.610	-0.645	-0.025
X ₆	-0.0005	-0.313	-0.0006	-0.0233	-0.0001
D ₁	-0.582	-1.562	-0.133	-0.150	-0.123
X ₇	-0.036	-2.389**	-0.257	-0.312	-0.007
D ₂	0.268	0.680	0.049	0.057	0.056
X ₈	0.107	2.398**	0.206	0.307	0.022
X ₉	0.081	3.441**	0.252	0.636	0.017
X ₁₀	-0.011	-1.957**	-0.115	-0.119	-0.002
constant	2.993	3.78**	1.516	2.078	-

LR test = 103.995

ESTRELLA R-SQUARE	0.28901
MADDALA R-SQUARE	0.25705
CRAGG-UHLER R-SQUARE	0.36676
MCFADDEN R-SQUARE	0.24620
PERCENTAGE OF RIGHT PREDICTIONS =	0.78286

* Significant at 10 percent level

** Significant at 5 percent level

Conclusion

The study evaluated the factors influencing on repayment performance of farmers in Khorasan-Razavi province of Iran. The logit model seeks to explain the probability of loan on time repayment as a result of any of the identified independent variables. The signs of the coefficient of independent variables and significance of the variables were used determining largely the impact of each variable on probability of dependent variable. Results showed that farmer's experience, income, received loan size and collateral value have positive effect while loan interest rate, total application costs and number of installment implies a negative effect on repayment performance of recipients. Comparison the elasticities of significant variables indicated that loan interest rate is the most important factor in our model. Farming experience and total application costs are the next factors respectively.

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