Factors affecting the solvency of agricultural cooperatives in Vinh Long province

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ABSTRACT

This study has identified the factorsfactors affecting the solvency of agricultural cooperatives in Vinh Long province, Vietnam. This study conducted surveys of 626 farmers and filtered out 297 farmers who are currently in debt to credit institutions and whose payments are not due or have been paid within 12 months. Multivariable linear regression method was used to determine factors affecting solvency of agricultural cooperatives in Vinh Long province. Based on the data, binary logistic was used for research. SPSS ver26 was used to measure the factors including age, educational level, size of farm, farm income, natural disasters - epidemics, interest rate to the solvency of agricultural cooperatives. The result of the study indicates that educational level, size of farm, farm income significantly affected the solvency of agricultural cooperatives. The results show five factors affecting the solvency of agricultural cooperatives in Vinh Long province, Vietnam, including three positive factors, two negative factors of the six initially factors of the research model. This result provides the basis for lenders to have a realistic view of their loan repayment effectiveness, and to adopt appropriate policies and practices to mitigate risk during operation. On the other hand, it can also help local, state, and local macro managers to adopt appropriate policies, implement poverty alleviation programs and ensure social security.

Keywords: solvency, agricultural cooperatives

1. INTRODUCTION

In business and finance, solvency is individual's ability to meet their long-term fixed expenses. The solvency in developing countries has become a major issue in the management's agricultural credit, particularly for smallholder farmers with limited mortgage assets. Social Policy Bank is one of the economic leverage tools in country to help poor, near-poor farmers and policy beneficiaries to access preferential credit capital, developing production, improving living conditions, rising out of poverty in order to contributing to the implementation's economic development policies associated with hunger eradication and poverty alleviation in social security. Social funds provide for poor and near poor farmers to purchase machinery, equipment, tools, seedlings, fertilizers, livestock feeds ... to develop production and business. Although the Social Policy Bank operates for non-profit purposes, is guaranteed the solvency by the government, the compulsory reserve ratio is 0%, does not have to participate in deposit insurance, is exempt from tax and budget payables but the risk of capital losses arising when the borrower fails to make repayments of debt, including interest or principal upon maturity or loss of principal. That is a matter for

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which the social policy banks still have to interested in it, to maintain capital for survival and development.

The solvency referred to the total amount loans be paid on time in the contract [1 – 2]. Thus, when the borrower pays the total amount of the loan on time, repayment is considered effective. Social policy banks are always concerned about the solvency or the repayment performance to minimize the risk of their operations. This study focuses on consideration of the factors affecting the solvency of agricultural cooperatives in Vinh Long province, Vietnam.

2. LITERATURE REVIEWS

In earlier times, the study focused on group-based lending [1, 3 – 5], the researchers said that the group-based lending repayment reduced risk, increased repayment capacity, therefore they recommend that credit institutions provide group-based lending. The recent research has to change, some studies indicate group lending was not necessarily reduce the risk that uses of the direct supervisor, regularly repayment schedule and uses of non-refinancing threats are factors to produce high repayment rates of from low-income borrowers without requiring collateral and without group lending contracts which have a general responsibility [6]. These studies focused on the personal lending repayment [2, 6 – 7]. The credit institutions providing funds to low income groups tend to choose the main market segments as rural and farmers. Many studies have examined the factors affecting to the solvency of agricultural cooperatives.

Young- Chul studied the factors affecting the small farm's repayment ability in South Korea. The purpose of this study was to assess the farmer's repayment performance repayment and to examine the factors affecting the small farm's repayment ability in South Korea. Farm size, the process of surveying when the loan is

made, the profit of the farm affect the repayment ability, in which farm size has a negative impact to the repayment ability [7]. In another study of the factors affecting the smallholder's repayment ability in Malawi, China et al. (1997) has shown income from the crop, farm size, level of diversification, received conversion income and quality information affecting the farmer's repayment ability [8].

Okorie examined the determinants of the small farmers' repayment who were customers of State Agricultural Credit Corporation Ondo in Nigeria. The four key determinants that was identified to have a great impact on the repayment performance of farmers, including: the nature of disbursements, the timeliness of disbursements and profitability of the business has been invested capital [9].

In Orebiyi's research, the author showed the decisive factors affecting the solvency of agricultural cooperatives were the loan amount, age, the literacy level of the borrower, the level of loan supervision [10].

Oke et al studied the factors affecting the solvency of agricultural cooperatives in south Western Nigeria. The study indicated to the factors affecting the solvency of agricultural cooperatives include: income, ability of interaction with the bank, amount of business investment, loan amount, level of access to business information, penalties for late repayment. The number of days between loan application and disbursement date, poverty index. Poverty index is a factor hindering repayment [11].

Afolabi showed that Factors affecting the solvency of agricultural cooperatives were farming experience, income from agriculture, non-farm income, farm size, non farm expenses, interest rates, cultivation cost. In particular, cultivation cost and interest rate have negative impact on repayment ability. The study identified the reasons for the unpaid

debt were crop failures, family commitments, disbursement of loan funds, high production costs, loan amounts, experience, gross farm income, interest rates and non-farm income have a significant impact on repayment ability. However, family size and non-farm expenditure have a negative impact on repayment ability [12].

The factors including the loan purpose, interest rates, income after borrowing, age of farmer, key products to generate farm income, the level of household head's education were factors affecting the repayment ability of farmers in Hau Giang province, following to Loc & Binh [13].

Nghi pointed out that the educational level, ethnicity, savings and loan purpose have a positive impact on the solvency of agricultural cooperatives on time in rural areas of Tra Vinh province; while the factor proportion of dependents, loan purpose, interest rate and age have a negative impact on the solvency of agricultural cooperatives on time [14].

3. RESEARCH MODEL AND HYPOTHESES

Based on previous studies on the factors affecting the solvency of agricultural co-operatives on time in agricultural field [7 - 10, 12 - 15], and a number of other studies on the solvency of agricultural cooperatives without the agricultural sector, such as services, trade and retail in rural areas [2, 6], the study propose a research model with the expectation of variables following.

The research model is defined as follows:

$$Log\,(\,S\,) = \alpha - \beta_1\,Age + \beta_2 Edu + \beta_3 FI - \beta_4 SFarm - \beta_5 DE - \beta_6 IR + ei$$

Where,
S: The solvency (Y = 0; Y = 1)
Age: Age of the borrower (years)
Edu: Education level of the borrowers
Sfarm: Farm size (ha)
FI: Farm income (million VND / year)
DE: Natural disasters, epidemics
IR: Interest rate (% /month)

Table 1. Interpretation of independent variables in research models and research hypotheses

Variable	Expected	Source
Age	-	(Aghion & Morduch, 2000; Loc & Binh, 2011; Nawai & Shariff, 2012; Nghi, 2012; Orebiyi, 2002) [2, 6, 10, 13 – 14]
Educational level	+	(Loc & Binh, 2011; Nghi, 2012; Orebiyi, 2002) [10, 13 – 14]
Size of Farm	-	(Young-Chul, 1978) [7]
Farm income	+	(Loc & Binh, 2011; Oke et al., 2007; Okorie, 1986; Young-Chul, 1978) [7, 9, 11, 13]
Impact of natural disasters, epidemics	-	(Afolabi, 2010) [12]
Interest rate	-	(Afolabi, 2010; Loc & Binh, 2011; Nghi, 2012) [12 – 14]

4. METHODS

Multivariable linear regression method was used to determine factors affecting solvency of agricultural cooperatives in Vinh Long province, by the questionnaire was designed based on previous research, based on two major studies of Afolabi (2010) [12] and Nghi (2012) [14].

These test questions have been reviewed by some experts with experience in credit management at social policy banks and farmers with bank loans on production.

The questionnaire has questions that are used to collect general information on respondents such as gender, education, experience,

ethnicity, age, occupation; the question's information to assess the solvency of agricultural cooperatives on time.

Respondents were farmers using bank loans in Vinh Long province, Vietnam. Samples were selected by random sampling. The questionnaires were sent directly to the respondents (the farmer borrows money from the bank, with a deadline for compulsory loan before February 2018), with a total of 626 questionnaires. Collection of questionnaires was conducted by the research team for a period of approximately three weeks. After eliminating invalid responses, the total number of questionnaires were 297. Data after being stored and processed on two software are excel and SPSS ver26.
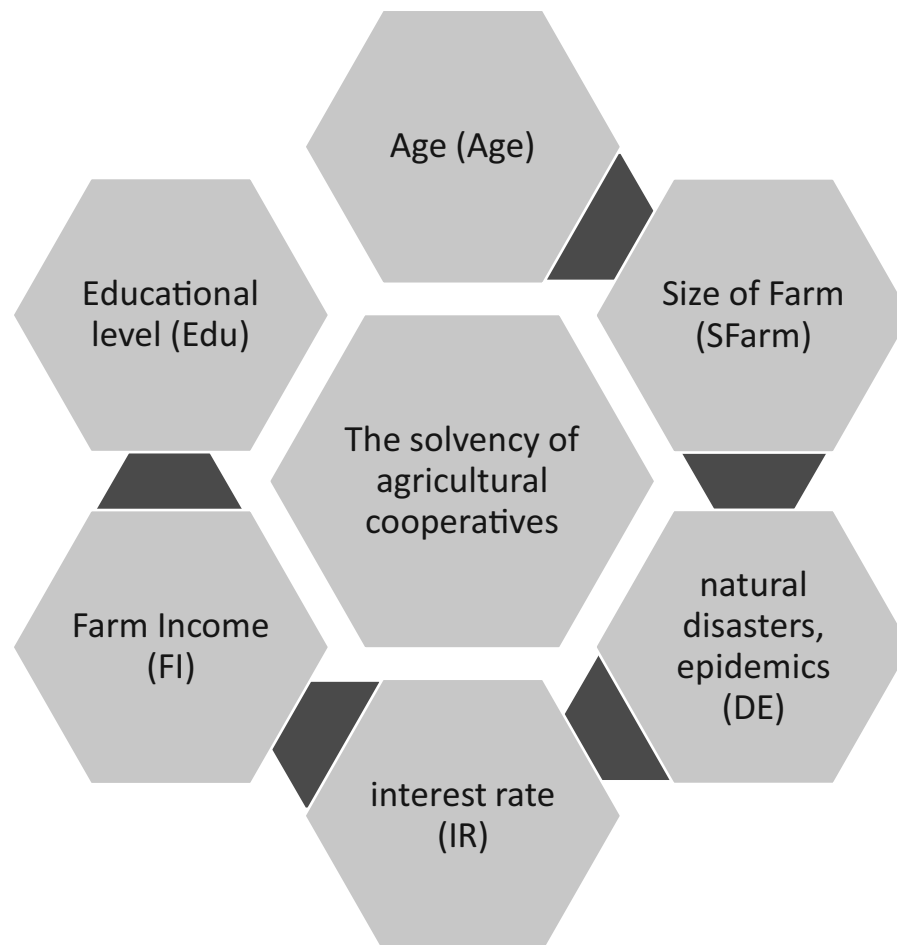

Figure 1. Research Model

5. DATA ANALYSIS

According to the survey results, 297 farmers in Vinh Long province have 51,3% of primary school, 27.8% of lower secondary and 20.9% of upper secondary education. The survey also shows that the age of the head of household is mostly from 20 to 60 (accounting for 22% to 68%). The farm size ranges from 1 to 3 hectares. Most of the income of household is from 100 million to less than 300 million VND (65%).

As a result of the survey on household's loans, interest rates ranged from 0.8% per month to 0.98% per month. The model determines the repayment ability based on six independent factors, including Age, Edu, Sfarm, FI, DE, IR and dependent variable are R.

Binary dependent variable has two values 0 and 1 corresponding to default and debt repayment.

Table 2. Omnibus Tests of Model Coefficients

		Chi-square	DF	Sig.
Step 1	**Step**	84.395	6	.000
	Block	84.395	6	.000
	Model	84.395	6	.000

Table 3. Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
first	36.536^a	.461	.783

a. Estimation terminated at iteration because parameter estimates changed by less than .001.

On the Model Summary table: The -2 Log likelihood index of the model is 36.536^a shows the suitability of the overall model of the authors proposed above.

Table 4 Classification shows the classification of payables and defaults on two criteria: real and predicted observations. Of the 22 observed cases of default, 18 were unlikely to be repaid, with a predicted rate of 81.8%. In 113 cases of debt repayment, 109 cases were expected to be paid, so the predicted correct rate was 96.5.

Table 4. Classification

Observed			Predicted		
			S		Percentage Correct
			0	1	
Step 1	S	0	18	4	81.8
		1	4	109	96.5
	Overall Percentage				94.1

a.The cut value is .500

Analysis of Binary Logistic regression on SPSS ver 26 to find the factors affecting the timely repayment ability due to the above model, with the hypothesis test Sig.F = 0.00 < 5%. The analysis showed that in the six independent variables included in the model, Age variables (Age) was not statistically with significant level at the 5%, the remaining five variables were statistically with significant level at the 5%, in which the educational level (Edu), size of farm (Sfarm), and farm income (FI) have a positive influence on the timely repayment ability. While the remaining factors as the interest rate (IR), impact of natural disasters, epidemics (DE) have a negative impact with the ability timely repayment ability of the farmers in Vinh Long province, Vietnam; in which, the interest rate factor has the strongest impact on timely repayment ability of the farmers.

Table 5. Results table of variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ª	**Edu**	2.591	1.168	4.925	1	.026	13.349
	Sfarm	1.147	.431	7.088	1	.008	3.149
	FI	1.163	.527	4.875	1	.027	3.199
	DE	-2.801	1.414	3.923	1	.048	.061
	Age	-1.537	.825	3.469	1	.063	.215
	IR	-23.425	6.762	12.000	1	.001	.000
	Constant	18.161	6.330	8.231	1	.004	77147508.701

a.Variable(s) entered on step 1: Edu, Sfarm, FI, DE, Age, IR.

6. FINDINGS AND IMPLICATIONS

The result shows that the education level (Edu) of the farmers (borrower) has a positive impact on timely repayment ability. In general, the higher level of education can lead to the higher level of awareness, leading to a better management capacity, a better organization of production and business activities, thus generating better income. This finding is consistent with the initial hypothesis of the study and is consistent with the results of previous studies [10, 13 – 14]. In order to enhance the efficiency of timely repayment ability, the state managers, stakeholders in agricultural and rural development projects, hunger eradication and poverty reduction should have support programs, training, career counseling, agricultural production techniques for farmers to help them have better knowledge, organize the production process better.

Farm income (FI) has a significant positive effect on timely repayment ability of farmers. Obviously, the higher the income, the more likely timely repayment ability, because farm income is considered to be the main source of farmers' income. This result is consistent with the initial hypothesis of the study and consistent with the results of all previous studies [7, 9, 11, 13].

The age of the farmer (borrower) (Age), the interest rate (IR) are two factors that have a negative impact on timely repayment ability. This can be explained. The higher the borrower's age, the higher the risk of repayment ability. Interest rates are a significant factor affecting timely repayment ability because interest rates are the cost of borrowing that the borrower has to pay, which is a reduction in net income of the farmer. Therefore, when reviewing loan applications to ensure the effectiveness of loan repayment, lenders should carefully assess the case of high age borrowers, the high number of dependents in the farmers. On the other hand, lenders need to have a reasonable interest rate policy so that the borrower can better guarantee their timely repayment ability. High interest rates can easily lead to low repayment ability. This result is consistent with the initial hypothesis of the study and consistent with the results of all previous studies [2, 10, 12 – 14].

Size of farm (Sfarm), according to research results, have a positive impact on household's timely repayment ability in Vinh Long province, Viet Nam. However, this result refutes the initial hypothesis of the study that there is a negative relationship, which is also contrary to

the results of previous studies [7, 12]. In particular, Afolabi pointed out that family size has a negative impact on household's timely repayment ability, Young-Chul points out that farm size has a negative impact on farmer's timely repayment ability.

7. CONCLUSIONS

The results show five factors affecting the solvency of agricultural cooperatives in Vinh Long province, Vietnam, including three positive factors, two negative factors of the six initially factors of the research model. This result provides the basis for lenders to have a realistic view of their loan repayment effectiveness, and to adopt appropriate policies and practices to mitigate risk during operation. On the other hand, it can also help local, state, and local macro managers to adopt appropriate policies to implement poverty alleviation programs and ensure social security.

There are some limitations in this study, the factors only have a simple linear relationship, New research model may increase other factors and build a complex linear, nonlinear relationships due to show better influence, which may have intermediate variables. The sample size of the study, although appropriate, may increase further to ensure better representation for the whole.

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Các nhân tố ảnh hưởng đến khả năng thanh toán của các hợp tác xã nông nghiệp trên địa bàn tỉnh Vĩnh Long

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TÓM TẮT

Nghiên cứu này đã xác định các nhân tố ảnh hưởng đến khả năng thanh toán của các hợp tác xã nông nghiệp trên địa bàn tỉnh Vĩnh Long, Việt Nam. Nghiên cứu này tiến hành khảo sát 626 nông dân và lọc ra 297 nông dân hiện đang nợ các tổ chức tín dụng và chưa đến hạn trả nợ hoặc đã trả nợ trong vòng 12 tháng. Phương pháp hồi quy tuyến tính đa biến được sử dụng để xác định các nhân tố ảnh hưởng đến khả năng thanh toán của các hợp tác xã nông nghiệp trên địa bàn tỉnh Vĩnh Long. Dựa trên dữ liệu, logistic nhị phân đã được sử dụng để nghiên cứu. SPSS ver26 được sử dụng để đo lường các yếu tố như độ tuổi, trình độ dân trí, quy mô trang trại, thu nhập trang trại, thiên tai - dịch bệnh, lãi suất đến khả năng thanh toán của các hợp tác xã nông nghiệp. Kết quả nghiên cứu chỉ ra rằng trình độ học vấn, quy mô trang trại, thu nhập trang trại ảnh hưởng đáng kể đến khả năng thanh toán của HTX nông nghiệp. Kết quả chỉ ra 5 nhân tố ảnh hưởng đến khả năng thanh toán của HTX nông nghiệp tỉnh Vĩnh Long, Việt Nam, trong đó có 3 nhân tố tích cực, 2 nhân tố tiêu cực trong 6 nhân tố ban đầu của mô hình nghiên cứu. Kết quả này là cơ sở để các bên cho vay có cái nhìn thực tế về hiệu quả trả nợ của mình, từ đó có những chính sách và thông lệ phù hợp để giảm thiểu rủi ro trong quá trình hoạt động. Mặt khác, nó còn có thể giúp cho các nhà quản lý vĩ mô của địa phương, nhà nước và địa phương đưa ra các chính sách phù hợp, thực hiện các chương trình xóa đói giảm nghèo và đảm bảo an sinh xã hội.

Từ khóa: khả năng thanh toán, hợp tác xã nông nghiệp