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Determinants of Access to Finance for SMEs: Evidence of Sayaboury Province, Lao PDR

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Abstract

Lao PDR is one of the least developed countries which an average income of less than $1.90/day therefore access to finance or formal and informal credits is very important for lifestyle and business operation. For evidence of Sayaboury district and province, it is a province that share border with Thailand, so access to finance to support manufacturing and services is necessary. Based on literature reviews, the researcher tries to survey the Small and Medium Enterprises (SMEs) which registered with the department of industry and commerce of Sayaboury district, a total of 1,492 enterprises. Thus, I used the Taro Yamane (1975) method to random and equal to 136 sampling or questionnaires and implied with a binary logistic regression model to estimate the probabilities of SMEs to access to finance. The results found that there are only four factors that determinants of the SMEs' access to finance for evidence of Sayaboury district and province at 1% statistical significance level, including collateral, business sector, business plan and business information. While as the age of business is significant at the statistically 10% level. The study reveals that lenders or creditors discriminate those factors which the business or entrepreneur that has collateral are 23.85 times more likely affected to access finance than other do not have and the entrepreneurs who have a business plan can access finance more than the others do not have with 6.72 times. Furthermore, the manufacturing sector is able to access to finance than the SMEs who operator services 0.32 times. In addition, the entrepreneurs who can access the information of lenders have the probability to have access to finance are 0.14 times more likely than others at 1% statistical level. But the age of business significant effect on the SMEs' access to finance at 10% statistically level, meaning that if a one-year increase in the age of business is more likely increase access to finance or loan by 4.6%. In this paper, the researcher does not compare the access to formal and informal finance and the structure of SMEs, therefore further researchers should consider the structure of SMEs promotion and support in Laos.

Keyword: *Finance, SMEs, Logit Model.*

1. Introduction

Small and Medium Enterprises (SMEs) are considered the basic business of large businesses; therefore, it has an important role in economic development in terms of manufacturing, trade and services, being the mechanism of economic driving. The SMEs sector is also perceived to be the backbone of any economy worldwide by their main contributions to national income, poverty reduction and export promotion (Nguyen & Luu, 2013). Currently, the SMEs have been classified by labor, asset, income and expenditure of business and divided into 3 categories: Micro, Small and Medium. According to the economic survey in 2013 found that there are 134,577 businesses in Lao PDR which micro-business covered by 80%. For Sayaboury province, it is a province that shares a border with Thailand which causes it to have many potentials whether exports and financial transaction. There are 9,787 business units registered which medium business total of 266 units, small business 968 units and micro-business 8,553 units and the SMEs registered in Sayaboury total of 2,002,961.19 million kips (Province Annual Report, 2016).

The SMEs' access to finance in Sayaboury district has been faced many challenges. The problem that some SMEs are unable to access loan sources is that their business health is not strong or can't be measured. Another aspect is that access conditions are too strict, so SMEs can climb over them, either using securities as collateral or using only personal guarantees but still not able to access funding sources as they should. Because most of them lack preparation before applying for a loan. For the above reasons, motived the researcher to imply the binary logistic regression to estimate the effect of the factors on access to finance of SMEs. Logistic regression is the appropriate regression analysis to conduct when the dependent variable is dichotomous (binary). It is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval, or ratio-level independent variables. Logistic regression is essentially used to calculate (or predict) the probability of a binary (yes/no) event occurring. According to literature reviews, logistic regression was used by many researchers such as Byiers et al. (2010), Michaelas et al., (1999) and Klapper, Laeven, & Rajan (2010) to estimate the probability of access to finance of SMEs. However, the use of such financial models is still limited, especially in assessing the factors that determine the accessibility of finance for SMEs.

Therefore, this paper aims to estimate the effect of the factors on access to finance for SMEs in Sayaboury district and province of Lao PDR by the logistic regression model. The outcomes of this paper will express the determinants of access to finance for SMEs which will be basic information for related partners whether entrepreneurs and researchers.

2. Materials and Methods

2.1 Data Collection

This paper researcher used primary data, the survey and collected data were conducted on January-March, 2021. The population was used in this study is the Small and Medium Enterprises (SMEs) which registered an enterprise with the official of industry and commerce in Sayaboury District (Lao PDR), a total of 1,492 enterprises. However, during this period there is Covid-19 Pandemic which affects data collection therefore Taro Yamane (1975) was used to a random sample, written as follows:

$$n = \frac{N}{1 + Ne^2} = \frac{1{,}492}{1 + 1{,}492(0.05)^2} = 315.43$$

Where n: Number of Samples

N: the Population (total of registered enterprises)

e: error term or decimal, in this study defined e=0.05.

to make it easy to analyze and more clearly, the researcher decided to use 316 samples for collection data.

2.2 Estimation Model

Logistic Regression was used to estimate the relationship between access to finance both formal (Banks and Financial Institutes) and informal (Cousin and others). The logit model is used to derive the determinants of access to finance by ensuring that the probability lies in the interval of 0 and 1.

$$\pi = \begin{cases} 1 Access \\ 0\ Otherwise \end{cases}$$

This study as the survey only provided information as to whether or not an enterprise secured a bank or informal loan, but did not provide the actual amount of loan. Generally, the binary logistic regression is defined by the following function:

$$log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_k X_k \quad (1)$$

Where π: probability, $0 < \pi \leq 1$

$\beta_i > 0$: if X_i increasing will impact on π increase, meaning that more likelihood.

$\beta_i < 0$: if X_i increasing will impact on π decrease, meaning that less likelihood.

The probability of SMEs access to finance is given by the statistical expressed as:

$$P(\pi = 1|X_1, \dots, X_k) = \frac{1}{1+exp^{(-\pi)}} \quad (2)$$

Which

$$\pi = \beta_0 + \beta_1 CT_t + \beta_2 R_t + \beta_3 Inc_t + \beta_4 BA_t + \beta_5 STR_t + \beta_6 LSB_t + \beta_7 BP_t + \beta_8 BRF_t + \beta_9 BI_t + \beta_{10} BS_t + \beta_{11} Gen_t \quad (3)$$

Obviously, the logistic distribution function transforms the regression into the interval (0, 1). Further defining the logit (π) as:

$$log\left(\frac{\pi}{1-\pi}\right) = \beta_0 + \beta_1 CT_t + \beta_2 R_t + \beta_3 Inc_t + \beta_4 BA_t + \beta_5 STR_t + \beta_6 LSB_t + \beta_7 BP_t + \beta_8 BRF_t + \beta_9 BI_t + \beta_{10} BS_t + \beta_{11} G_t + \varepsilon_t \quad (4)$$

Hypothesis:

- $\beta_1 > 0$ the business that has collateral could access finance more than otherwise which Michaelas et al., (1999) suggest that bank financing depends on whether lending can be secured by collateral.

- $\beta_2 < 0$ the researcher supposed that if the interest rate is high, it will make business access to finance decrease due to the repayment ability.

- $\beta_3 > 0$ the researcher assumed that if the business income increased will make it access to finance more due to the probability of payment.

- $\beta_4 > 0$ As firms' sources of finance change over time, firm age can be stated as another important determinant of access to bank finance. North et al., (2010) found that there is a positive correlation between firm age and access to bank finance. Oswald, & Gardiner (2005) also suggests that older firms should be less reliant on external financing sources than younger firms as older firms have more opportunities to accumulate retained earnings than younger firms and more internal funds are available to finance their operations.

- $\beta_5 > 0$ the SMEs in the manufacturing sector require relatively large investments in assets such as land, factory building, plant and machinery, vehicles, while most of the service organizations and retail sector organizations in the SME sector need fewer investments in fixed assets. Byiers et al. (2010) found that the industry sector was an important determinant for having access to credit.

- $\beta_6 > 0$ Incorporation may be perceived by banks and other finance suppliers as an encouraging sign of the firm's formality and creditability as incorporated firms appear to be in a very favored position in receiving external funding in comparison with unincorporated firms (Cassar, 2004).

- $\beta_7 > 0$ A business plan is a written document that explains the business and is a living document that is used as a benchmark for a firm's internal performance assessment as well as a tool for accessing funds (Kusi, 2015).

- $\beta_8 > 0$ The operators of SMEs have to own more tangible assets that can create higher value on their firm to accelerate borrowing security (Fatoki & Smit, 2011).

- $\beta_9 > 0$ The lenders use business information to decide borrowers' credibility whether to issue or extend a loan or not. Therefore, lack of information leads to information asymmetry and jeopardizes access to credit (Sarapaivanich & Kotey, 2006).

- $\beta_{10} > 0$ Small firms encounter difficulties in obtaining credit because they finance a larger share of their investment with informal sources such as money lenders, family or friends, or heavily depend on short term bank loans whereas larger firms facilitate their investment by a greater share of formal external sources of financing (Beck & Kunt, 2006).

- $\beta_{11} > 0$ Hisrich and Brush (1986) suggested that women experienced difficulties in accessing bank loans because of their gender. This might be due to the fact that loan officers were risk-averse and they negatively viewed female loan applicants because of their perceived poor track record, lack of strategic planning and market plans.

The researcher used the Hosmer and Lemeshow test for checking the goodness of fit in the logistic model (Field, 2009).

3. Results

3.1 Descriptive Analysis

According to data collected from 136 enterprises, there are 60.1% of respondents are female and 39.9% of them are male. The survey also found that the entrepreneurs operate business below or equal 5 years accounting for 25.9%, while 6-10 years accounting for 41.2% and more than 10 years covered 32.9% respectively. Furthermore, 94.9% of the respondents are private businesses and 5.1% are partnership or cooperative. Moreover, 75.3% of the respondents are manufacturing sector and 24.7% are services sector. All of the access to the formal source must have a business plan, covered 58.2% whereas access to informal sources does not have a business plan, covered 41.8%. In addition, it expressed that micro-business covered 94.9%, small business covered 3.5% and medium business 1.6% respectively (table 2). The survey also found that the maximum of the registered fund was 1,900 million kip and the minimum was a million kip. For the collateral, it indicated that if the respondent's loan with their cousin there does not have. In contrast, if the loan from is the bank or financial institute and black market, the collateral is necessary. The survey also showed that the average income of the business of respondents is 10.6417 million kip per month. Finally, the study also reveals that 39.6% of the respondents can access finance whereas 60.4% of them do not although the access to information is covered by 88.6%.

3.2 Logistic Regression Analysis

According to the theories and literature reviews suggest that all of the independent variables were used in the binary logistic regression model should not have the multicollinearity over .80 (Berry, W.D & Feldman, S. 1985) and the results indicated there is no variable greater than .80, the correlation is between .214 and -.139 indicating as there is no multicollinearity problem among data used in the analysis, meaning that we could imply them with the binary logistic regression model. For The Hosmer and Lemeshow test for the goodness of fit in the logistic model expressed that Prob > Chi2 = 0.8749, we cannot reject the null hypothesis, indicating the model is a good fit and the estimated odd ratios for the coefficients was presented as the table 3 in the appendix.

In empirical analysis found that there are only four factors that determinants of access to finance for SMEs at the statistically 1% level, including collateral, business sector, business plan and business information while the business age is significant at the statistically 10% level. Based on the analysis outcome, the collateral has a positive significant effect on SMEs' access to finance at 1% significance level with an odd ratio of 23.85, indicating that the business or entrepreneur is 23.85 times more likely affected to access finance than other do not have which consistent with previous studies by Michaelas et al., (1999). The results also found that business plan has a positive effect on SMEs access to finance at 1% statistical level, indicating that the entrepreneurs who have a business plan can access finance more than the others do not have with 6.72 times (Kusi, Opata & Narh, 2015) and business sectors also has a

positive significant which indicated that manufacturing sector has more impact on financial access than the services sector at 1% statistically level, concluded the manufacturing sector able to access finance than the SMEs who operator services 0.32 times (Byiers et al.,2010). Otherwise, the entrepreneurs who can access the information of lenders have probability to access finance are 0.14 times more likely than others at 1% statistical level (Sarapaivanich & Kotey, 2006). In addition, the results also reveal that business age has positive significant effect on the SMEs have access to finance at 10% statistically level. The odd ratio of business' age is 1.046, indicating that a one-year increase in the age of business is more likely to increase access to finance or loan by 4.6% (North et al., 2010). However, the business income, legal of business status, business registered fund, business size and gender are positive but insignificant. This result implies that lenders or creditors do not discriminate against those factors. In terms of classification of predicted (table 4) found that overall, the prediction accuracy of the model is 86.39%, indicates this model is considered acceptable.

4. Discussion

According the survey and empirical analysis by binary logistic regression model found that the model is good of fit and accuracy to predict the SMEs access to finance by 86.39% which indicates the collateral has positive significant effect on SMEs access to finance as the consistent of Michaelas et al., (1999) that bank financing depends on whether lending can be secured by collateral and business plan has positive effect on SMEs access to finance as the consistent of Kusi, Opata & Narh, (2015) and Fatoki (2014) because the availability of business plan and a good credit score are critical lending requirements. Otherwise, if the borrowing SME does not have enough financial evidence for the lender to see the future that they can pay back the debt., the chances of getting approval are difficult. Klapper, Laeven, & Rajan (2010) also indicated that the younger firm in operation are likely to rely on debt financing from lenders. But Gregory, Rutherford, Oswald, & Gardiner (2005) argued that older firms should be less reliant on external financing sources than younger firms as older firms have more opportunities to accumulate retained earnings than younger firms and more internal funds are available to finance their operations. For business sector has positive significance effect on financial access of SMEs which manufacturing sector has more impact on financial access than the services sector, consistent with the study of Byiers et al., (2010) and Carreira (2010) argued that, for most services, the main input was human and not physical capital and therefore service sector firms found it hard to use physical capital as collateral when resorting to external finance. In terms of business, information has positive significant as the consistent of Sarapaivanich & Kotey (2006) that lack of information leads to information asymmetry and jeopardizes access to credit because the information is concerned with awareness of funding opportunities by SMEs (Osano & Languitone, 2016). Base on the controversy above, the determinants of SMEs' access to finance could not be concluded (remain a controversial problem). Therefore, Comparing the SMEs access to fiancé both the informal and informal sources will make the outcome clearer, so further researchers should consider this problem as the process of borrowing from formal or informal finance and study the structure of SME promotion and support in Laos.

5. Conclusion

As the empirical analysis by the binary logistic regression model indicated that there are only four factors that determinants of the SMEs' access to finance for evidence of Sayaboury district and province at 1% statistical significance level, including collateral, business sector, business plan and business information. While the age of business is significant at the

statistically 10% level. The study reveals that lenders or creditors discriminate those factors which the business or entrepreneur that has collateral are 23.85 times more likely affected to access finance than other do not have and the entrepreneurs who have a business plan can access finance more than the others do not have with 6.72 times. Furthermore, the manufacturing sector is able to access finance than the SMEs who operator services 0.32 times. In addition, the entrepreneurs who can access the information of lenders have the probability to access finance are 0.14 times more likely than others at 1% statistical level. But the age of business significant effect on the SMEs access to finance at 10% statistically level, meaning that if a one-year increase in the age of business is more likely to increase access to finance or loan by 4.6%.

6. Conflict of Interest

We certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

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Table 1. Variables Description

Code	Description	Measurement Unit
CT	Collateral	Dummy, if 1=Yes, 0= No
R	Loan Interest Rate	Continuous that is used in percentage
Inc	Business Income	Continuous that is used in million kip
BA	Business Age	Continuous indicating age of business in year
STR	Business Sector	Dummy, if 1=Manufacturing, 0=Services
LSB	Legal Status Business	Dummy, if 1=Partnership (Cooperative), 0= Private
BP	Business Plan	Dummy, if 1= Yes, 0=No
BRF	Business Registered Fund	Continuous that is used in million kip
BI	Business Access to Information	Dummy, if 1= Access, 0= Otherwise
BS	Business Size	Category, if 1=Micro, 2=Small, 3=Medium
G	Gender of the firm head	Dummy, if 1=Male, 0=Female
ε	Error term	

Table 2. Descriptive Statistics of the variables used in the logit regression

Variables	Mean	Std.DV	Min	Max
G	0.3987	0.4904	0	1
BA	10.4651	6.8957	1	33
LSB	0.9493	0.2195	0	1
STR	0.7531	0.4318	0	1
PB	0.5822	0.4939	0	1
BS	2.0221	0.2170	1	3
BRF	87.6634	221.3219	1	1900
CT	0.4493	0.4982	0	1
R	5.83	7.3853	0	30
Inc	10.6417	10.6417	0.5	100
BI	0.8860	0.3182	0	1

Source: Survey on January-March, 2021

Table 3. Binary Logistic Regression Output

Access (π)	**Odd ratio**	**Std. Err**	**z**	**P>z**
CT	23.8545	12.0907	6.26	0.000*
R	1.0371	0.0308	1.22	0.221
Inc	1.0113	0.0147	0.77	0.439
BA	1.0463	0.0276	1.71	0.087***
STR	0.3296	0.1375	-2.66	0.008*
LSB	3.7921	3.2046	1.58	0.115
BP	6.7277	3.2571	3.94	0.000*
BRF	0.9988	0.0009	-1.25	0.211
BI	0.1459	0.0952	-2.95	0.003*
BS				
Micro	0.6750	1.1113	-0.24	0.811
Small	0.5966	1.0566	-0.29	0.771
G	0.7094	0.2675	-0.91	0.363
Cons	0.2842	0.5191	-0.69	0.491

Number of Obs = 136 **LR chi2(12) = 205.42**
Prob > chi2 = 0.0000 **Pseudo R2 = 0.4843**
Log likelihood = -109.3824

Note: *,**&*** indicates the variables are significant at 1%, 5% and 10% significance level respectively.

Table 4. Classification of Predicted

True			
Classified	D	~D	Total
+	109	27	136
-	16	164	180
Total	125	191	316
Classified+ if predicted Pr (D) >= .5 True D defined as Access! = 0			
Sensitivity Specificity Positive predictive value Negative predictive vlue	$\Pr(+\|D)$ 87.20% $\Pr(-\|\sim D)$ 85.86% $\Pr(D\|+)$ 80.15% $\Pr(\sim D\|-)$ 91.11%		
False + rate for true $\sim D$ False + rate for true D False + rate for classified + False + rate for classified -	$\Pr(+\|D)$ 14.14% $\Pr(-\|\sim D)$ 12.80% $\Pr(\sim D\|+)$ 19.85% $\Pr(D\|-)$ 8.89%		
Correctly classified	86.39%		