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Accessibility to Microcredit by Small- and Medium-sized Enterprises in Malaysia

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Abstract

This study investigates the determinants of Malaysian SMEs' accessibility to microcredit, because obtaining bank financing is not popular among small-scale enterprises. We employ logistic regression to analyze the key determinants of accessibility to microcredit among these SMEs. Using survey data on SMEs' owners/managers in Terengganu, Malaysia in 2016, we find factors influencing microcredit accessibility include married, ethnicity, financial training, household income, age of enterprise, ownership, networking with non-governmental organizations, networking with microfinance institutions, networking with business associations, and distance of business premises to the nearest microcredit provider.

Key words: access; microcredit; logit model; SMEs; Malaysia

JEL classifications: L26; O53

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1. Introduction

Small- and medium-sized enterprises (SMEs) are vital to an economy's growth, especially in developing countries. Most SMEs are relatively simple in their organizational structures and objectives, and managers are frequently the owners of these firms. They aim to maximize expected profit while facing time, information, and resource constraints (Decker & Zhao, 2004). According to the Department of Statistics Malaysia (2016), domestic SMEs constituted 98.5% of the 920,065 business establishments in 2016. SMEs have increased employment in Malaysia by 57.5% in 2013, contributing 32.2% and 36.3% to GDP in 2010 and 2015, respectively (ASEAN, 2015). Currently, SMEs contribute to the Malaysia economy in the form of creating employment opportunities, generating income, and stimulating growth.

Despite their contribution to the overall economy, SMEs face many difficulties in operating their businesses. Examining the financing practices and challenges among Malaysian SMEs, Wahab and Buyong (2008) discover that 84.3% of the respondents found it difficult to obtain external finance. Several studies have confirmed the mismatch between SMEs' credit demand and supply, known as a finance gap between SMEs and financial institutions (Beck & Demirguc-Kunt, 2006; Domeher, Musah, & Hassan, 2017; Stiglitz & Weiss, 1981). Previous research has revealed that access to credit is a vital funding source needed by SMEs (Akoten, Sawada, & Otsuka, 2006; Arzeni & Akamatsu, 2014; Harvie, Narjoko, & Oum, 2013). There is also supportive evidence for the benefits of microcredit access to businesses and business growth. For instance, the availability and accessibility of finance influence the successful performance of SMEs (Abdullah, Manan, & Khadijah, 2011), because access to credit allows SMEs to expand their businesses, acquire the latest technology, and undertake productive investments, thus ensuring their competitiveness (Ajagbe, 2012). Konstantinos S. Skandalis, Panagiotis G. Liargovas, and Merika (2008) investigate the effect of borrowing and management competence on firm performance in Greece, noting that highly leveraged firms operating in distressed industries can still improve their performance. This supports the positive influence of borrowing on firms. Similarly, Rouyer (2013) analyzes 250 large publicly traded companies in France and finds the degree of leverage positively affects a firm's long-term performance as measured by Tobin's Q. Thus, access to credit is important to firm performance and competitiveness.

The statistics on Malaysian SMEs in 2011 and 2016 report that only 21.9% and 32.1%, respectively, of them have received formal financing. These sources include banks and financial and microfinance institutions (Department of Statistics Malaysia, 2011, 2016). The primary source for SMEs' financing in Malaysia comes from internal funds such as borrowing from relatives, friends, or pawnshops. Approximately 95% of SMEs depend on personal financial resources such as the firm's owners and loans from friends and relatives (UNDP, 2007).

Recognition of the credit contribution to SMEs' growth and the limitation of formal financial institutions in providing credit to low-income groups such as SMEs have given rise to microfinance programs. The Malaysia central bank initiated a Microfinance Institutional Framework in 2006 with the aim of providing credit

facilities and financial assistance to SMEs. This framework was introduced to encourage participation by banking institutions to provide microcredit to SMEs. With flexible borrowing procedures for small firms such as no collateral requirement and minimal documentation including a reduction in the duration of approval and disbursement of funds, microcredit is deemed to be quite affordable (Shariff, Noor, & Nawai, 2011).

Given the microcredit importance and the existing constraints to microcredit access among SMEs in Malaysia, it is important to understand the key factors that influence their financing behavior. Previous researchers have focused on the accessibility of credit from various forms of financing (Abdesamed & Wahab, 2014; Akoten et al., 2006; Harvie et al., 2013), but the accessibility of Malaysian SMEs to microcredit remains under-researched. Therefore, this study examines the microcredit accessibility of Malaysian SMEs and explores key determinants of microcredit access for these entrepreneurs.

The remainder of the paper is organized as follows. Section 2 reviews the related literature on the determinants of microcredit access. Section 3 presents the study methodology and data. Section 4 reports the results. Section 5 concludes the study.

2. Literature Review

Access to credit is defined as an individual's ability to borrow from a particular credit source for a variety of reasons, but the individual may choose not to do so (Aliou & Zeller, 2001). When an individual has demand for credit and applies for it, the lender determines the success of the application according to the eligibility of the individual. SMEs that are able to borrow are guaranteed access to credit, but non-borrowing SMEs have no access to finance, because they face a choice between being voluntarily or involuntarily excluded from financial services (World Bank, 2008). Voluntary non-borrowers are those having access to finance, but choose not to use the financial services, whereas involuntarily excluded SMEs have demand for credit facilities, but are unable to access them (World Bank, 2008).

The literature identifies that access to microcredit is determined by household factors. For example, Li, Gan, and Hu (2011) study the determinants of microcredit access in rural Chinese areas at the household level, finding that access to microcredit provided by Rural Credit Cooperatives is restricted among poor rural women. They also discover that household factors such as household income, collateral assets, education level, geography location, and household size impact microcredit access differently. In particular, household income facilitates the household's access to microcredit, because their likelihood of paying the debt is higher, and thus they can have better access to microcredit. Takahashi, Higashikata, and Tsukada (2010) show that the characteristics of adult women have significant effects on participation in microcredit programs in Indonesia while other village and household characteristics are less relevant to the participation decision. More notably, collateral, measured as farmland and areas of residency, does not affect the participation. Nevertheless, richer families are more likely to gain microcredit access.

The aforementioned studies examine microcredit access at the household level, but there are limited studies considering the effect at the enterprise level. The microcredit objective is to help the 'unbankable' and poor people to establish their businesses. Therefore, SMEs' characteristics, such as firm age, firm size, and economic sector, are important. Umoh (2006) studies the determinants of microcredit access among Nigerian small firms, showing the significance of enterprise type on access to microcredit, but not for firm size. Peprah and Ayayi (2016) present that older SMEs are more likely to access microcredit than younger ones. The longer the firm is in business, the more sustainability the business is. In addition, younger businesses have disadvantages in exploiting debt compared with their mature peers. Therefore, examining the SME characteristics to microcredit access is important for a better understanding of the credit market in Malaysia.

Networking is another critical factor in credit access (Fraser et al., 2013; Moro & Fink, 2013; Shane & Cable, 2002). However, to the best of our knowledge, there are no studies specifically considering networking as a key factor in microcredit access. Therefore, networking is an interesting variable for research to control. The limited access to microcredit in Malaysia possibly results from poor networking with loan officials and business associations.

The distance between SMEs and credit providers can also negatively affect credit access (Petersen & Rajan, 2002; Presbitero & Rabellotti, 2014). Garikipati (2012); Ibrahim and Bauer (2013) document that a further distance increases the transaction costs and thus lowers the firm's possibility to access credit (Garikipati, 2012; Ibrahim & Bauer, 2013). Conversely, Dao, Mai, and Kim (2016) show that a distance over 20 km between an enterprise and a credit provider can reduce the likelihood of a credit constraint by 0.92%. This is the case when SMEs have already established a stable relationship with the credit provider. Therefore, they argue that distance is not important to credit access.

3. Methodology and Data

A structured questionnaire was used to collect relevant data from SMEs in Terengganu, Malaysia in 2016. There are many SMEs operating in Terengganu, and it is relatively easy to obtain data related to them and microcredit. In 2017, there were 29,324 SMEs operating in Terengganu (SME Corporation Malaysia, 2017). In addition, the top two microcredit institutions (Amanah Ikhtiar Malaysia and TEKUN) operate in this state.

The survey was designed to obtain information on the finance information of SME businesses, microcredit borrowers and non-borrowers, characteristics of the SME, and characteristics of owner/manager. It comprises five sections. Section one is designed to identify to which group a SME belongs - either microcredit borrower or non-borrower. Section two is designed to obtain information about microcredit borrowing especially the microloan's characteristics. Section three is designed for non-borrowers in which the survey queries the reasons for not borrowing and seeks their likelihood of borrowing in the future. Section four focuses on the characteristics

of the business, including years of establishment, sector in which the SME operates, ownership type, and performance indicators. To capture the performance of the SMEs, the annual total sales and numbers of full-time workers in 2012 and 2014 were requested. Section five covers the profile of SME owners' characteristics, such as age, ethnicity, marital status, educational level, and experience. We carried out a pilot test on a sample of 30 SMEs in Terengganu before the questionnaire was officially distributed. The pilot test of the survey questionnaire ensures content validity before the main survey is administered to enhance the study's reliability.

We use convenience sampling approach to collect the data. This is because we faced practical difficulties in obtaining a comprehensive list of SMEs and detailed information for the target population necessary for a probabilistic sample. Thus, the results from the survey cannot be interpreted beyond the sample.

In total, 600 questionnaires were distributed to SMEs, and 596 responses were received. Of the 596 responses, 98 SMEs were eliminated as unusable due to inadequate information. The overall response rate was 83.6% (498 useable responses). The responses are divided into two categories: microcredit borrowers consisting of 386 respondents and non-borrowers consisting of 112 respondents.

The individual's choices of many products and services are discrete. Similarly, accessibility to microcredit follows the discrete choice model (DCM) developed by Dan McFadden in 1972. DCM specifies the probability that the decision maker selects an option among the number of options as a utility function derived from these options. Based on the utility maximization theory, the decision maker is rational when choosing the option that maximizes his/her utility among the available options. Hence, the probability that a given option is selected is defined as the probability that has the maximum utility among those available options in the choice set (Ben-Akiva & Lerman, 1985; Train, 2003).

Assume the utilities are U_{in} and U_{jn} that the decision-maker *n* has from options i and j, respectively. The probability that the decision-maker *n* selects option *i* from a set of choices denoted as C_m is then written as (Train, 2003):

$$P_n(i \mid C_m) = \Pr(V_{in} - V_{jn}) > \varepsilon_{in} - \varepsilon_{jn}) \quad (1)$$

The utility noted as U_{in} is decomposed into two sub-functions, including a systematic component, V_{in}, that depends on the factors observed in this study only (i.e., the decision-maker characteristics and the choice) and random components that represent all factors that are unknown or not included in this study, denoted as ε_{in} and ε_{jn}. Hence, the utility function can be written as follows:

$$U_{in} = V_{in} + \varepsilon_{in} \qquad \forall \mathrm{i} \in \mathrm{C_m} \quad (1)$$

$$U_{jn} = V_{jn} + \varepsilon_{jn} \qquad \forall i, \mathrm{j} \in \mathrm{C_m \text{ and } } i \neq j \quad (2)$$

We rewrite the probability of choosing choice i when we substitute equations (2) and (3) into equation (1):

$$P_n(i \mid C_m) = \Pr(U_{in} > U_{jn}) = \Pr(V_{in} + \varepsilon_{in} > V_{jn} + \varepsilon_{jn}) \quad (3)$$

$$\text{Therefore,} \quad P_n(i \mid C_m) = \Pr(V_{in} - V_{jn}) > \varepsilon_{in} - \varepsilon_{jn}) \quad \forall i, j \in C_m \text{ and } i \neq j \quad (4)$$

A binary choice model indicates there are only two alternatives (i and j) available in C_m. The choice of probabilities that utility i is higher than utility j is expressed as:

$$\begin{aligned} &P_n(i) = \Pr(U_{in} > U_{jn}) \\ &= \Pr(V_{in} - V_{jn} > \varepsilon_{jn} - \varepsilon_{in}) \end{aligned} \quad (5)$$

Thus, the probability of selecting the alternative j is expressed as:

$$P_n(j) = 1 - P_n(i) \quad (6)$$

This study employs a logit model to investigate the factors that significantly affect mircocredit access by SMEs in Malaysia. The logit model is expressed as follows:

$$P_n(Y_n = 1) = \Pr(U_{1n} > U_{0n}) = \Pr(Z_n > 0) = \frac{1}{1 + e^{-\beta X_n}} \quad (7)$$

Here, Y_n equals 1 if the SME has access to microcredit and 0 otherwise; and P_n is the estimated probability of SMEs that have access to microcredit.

Equation (8) represents the cumulative logistic distribution function of microcredit access in a non-linear form, in which it is difficult to interpret the coefficients. Therefore, the model can be written in terms of the log-odds ratio (Maddala, 2001). If P_n is the probability that a SME has access to microcredit, then the probability that a SME has no access to microcredit or $(1 - P_n)$ is:

$$(1 - P_n) = \frac{1}{1 + e^{\beta X_n}} \quad (8)$$

Therefore, the odds in favor of having access to microcredit $(Y_n = 1)$ versus not having access to microcredit $(Y_n = 0)$ is given by:

$$\frac{P_n}{1 - P_n} = \frac{1 + e^{\beta X_n}}{1 + e^{-\beta X_n}} = e^{\beta X_n} \quad (9)$$

Taking the natural logarithm of equation (10), we have:

$$\log\left(\frac{P_n}{1 - P_n}\right) = Z_n^* = \beta X_n \quad (10)$$

Here, Z_n^* is the log-odds ratio, which is a linear function of the explanatory variables.

Table 1 defines explanatory variables used in the logit model. By adding a constant term into equation (11), the estimated model becomes:

$$Z_n^* = \alpha + \beta X_n \tag{11}$$

Here, α is a constant, and β is a vector of coefficients of explanatory variables X_n, including owner-characteristics, household characteristics, SME characteristics, networking, and distance.

Table 1. Descriptions of Variables

Variable	Description/measurement
Accessibility to microcredit	1 = SME has access to microcredit, 0 = otherwise
Gender	Gender of SME's owner/manager (1 = male, 0 = female)
Age_1 Age_2 Age_3	1 = below 35 years old, 0 = otherwise (Reference group) 1 = 36-45 years old, 0 = otherwise 1 = 46 years old and over, 0 = otherwise
Married	Marital status of SME's owner/manager (1 = married, 0 = otherwise)
Ethnicity	Ethnicity of SME's owner/manager (1 = Malay, 0 = otherwise)
Education	Educational attainment of SME's owner/manager (1 = higher than high school, 0 = otherwise)
Received financial training	1 = SME's owner/manager received financial training, 0 = otherwise)
Experience	1 = SME's owner/manager has work or business experience before running business, 0 = otherwise)
Household $size_1$ Household $size_2$ Household $size_3$	HS_1 = 1 for 3 or less people, 0 = otherwise (Reference group) HS_2 = 1 for 4 people, 0 = otherwise HS_3 = 5 or more people, 0 = otherwise
Income $earner_1$ Income $earner_2$ Income $earner_3$	IE_1 = 1-2 people, 0 = otherwise (Reference group) IE_2 = 3-4 people, 0 = otherwise IE_3 = more than 4 people, 0 = otherwise
Household income	Household income in Malaysian Ringgit (MYR); household annual income is divided into four levels: RM1000 to RM2000; RM2001 to RM3000; RM3001 to RM4000; and over RM4000
Age of enterprise	Age of the firm (number of years established)
Manufacturing sector Service sector Agriculture sector	1 = firm is in manufacturing, 0 = otherwise 1 = firm is in service, 0 = otherwise 1 = firm is in agriculture, 0 = otherwise (Reference group)
Size of enterprise	Size of the enterprise (number of employees in 2014)
Ownership	$X_{14}(1)$ = 1 if firm is sole proprietor; 0 = otherwise
Networking	Network variable includes the extent to which the SMEs network with **commercial banks**, **social organizations**, **NGOs**, **microfinance organizations**, and **business associations** measured on a scale of 0 = "Not at all" to 5 = "Very extensive"
Distance in km	Distance between borrower and microcredit provider (continuous variable)

Since the dependent variable is binary, and the probability should range between 0 and 1, we use maximum likelihood estimation to estimate equation (11) (Stock and Watson, 2012). The likelihood function of the unknown coefficients β, as in Verbeek (2008), is given by:

$$L(\beta) = \prod_{n=1}^{N} P\{Y_n = 1 \,|\, X_n; \beta\}^{Y_n} P\{Y_n = 0 \,|\, X_{n;} \beta\}^{1-Y_n} \tag{12}$$

Accordingly, the log-likelihood function is:

$$LL(\beta) = \sum_{n=1}^{N} Y_n \ln P_n + \sum_{n=1}^{N} (1 - Y_n) \ln(1 - \mathrm{Pn}) \tag{13}$$

Here, $P_n = P\{Y_n = 1 \,|\, X_n; \beta\}$ denotes the probability of microcredit access. Applying the formula for logit probabilities, the log likelihood function of the logit model is expressed as:

$$LL(\beta) = \sum_{n=1}^{N} Y_n \ln\left(\frac{e^{X_n\beta}}{1+e^{X_n\beta}}\right) + \sum_{n=1}^{N} (1-Y_n) \ln\left(\frac{1}{1+e^{X_n\beta}}\right) \quad (14)$$

Differentiating equation (15) with respect to β, we have the maximum likelihood estimator β:

$$\frac{\partial LL(\beta)}{\partial \beta} = \sum_{n=1}^{N} [Y_n - \frac{\exp(X_n\beta_n)}{1+\exp(X_n\beta_n)}] X_n = 0 \quad (15)$$

4. Results

4.1 Summary Statistics

Table 2 presents the profile of the sample respondents. The table shows 74.3% of the respondents are males and 25.7% are females; 38.2% of the respondents are in the age group 36-45 years old; relatively few are over 55 years old (9.8%). Malaysia is a multi-racial country with three main ethnic groups: Malay, Chinese, and Indians. Most borrowers and non-borrowers are Malay (76.3%). In terms of owner experience, most respondents (69.3%) possessed work or business experience before starting their business. The descriptive statistics also show 47% of SME owners have secondary school education, while 4.6% completed only primary school. The result also shows that households with more family members have participated more in microcredit. The sampled SMEs owners earn more than RM4,000 per month (70.5%).

Table 3 shows the characteristics of SMEs by age of enterprise, types of ownership, and sector. The largest group of microcredit borrowers (35.1%) have been operating for 10 to 14 years; the largest group of non-borrowers have been in business for only 5 to 9 years. The oldest SMEs in the sample have been in business for over 20 years (6.6%). A further 146 (29.3%) of the sampled SMEs have been operating for 5 to 9 years. Table 3 also shows 88.2% of the respondents are sole proprietors; the rest comprise household business establishments (3.0%), collective/cooperatives (1.0%), and limited liability companies (7.8%). In terms of business sector, most SMEs operate in the service sector (64.9%) followed by manufacturing (26.1%) and agriculture (9%).

Table 2. Profile of the Sampled Respondents

		Non-microcredit Borrower (N_1=112)		Microcredit Borrower (N_2=386)		All Respondent (N_3=498)		Statistical Test
		Count (n_1)	% to N_1	Count (n_2)	% to N_2	Sub-total (n_3= n_1+ n_2)	% to N_3	
Gender	Female	27	24.1%	101	26.2%	128	25.7%	
	Male	85	75.9%	285	73.8%	370	74.3%	χ^2 = 0.193
	Total	112	100.0%	386	100.0%	498	100.0%	
Age	Below 35 years	28	24.9%	43	11.1%	72	14.2%	
	36-45 years	46	41.1%	142	36.8%	188	37.8%	
	46-55 years	33	29.5%	157	40.7%	190	38.2%	χ^2 =19.353***
	More than 55 years	5	4.5%	44	11.4%	49	9.8%	
	Total	112	100.0%	386	100.0%	498	100.00%	
Marital status	Single	8	7.1%	10	2.6%	18	3.6%	
	Married	91	81.3%	369	95.6%	460	92.4%	χ^2 = 27.671***
	Divorce	13	11.6%	7	1.8%	22	4.0%	
	Total	112	100.0%	386	100.0%	498	100.0%	
Ethnicity	Melayu	74	66.1%	306	79.3%	380	76.3%	
	Cina	30	26.8%	63	16.3%	93	18.7%	
	India	8	7.1%	16	4.1%	24	4.8%	χ^2 = 9.648**
	Kadazan	0	0.0%	1	0.3%	1	0.2%	
	Total	112	100.0%	386	100.0%	508	100.0%	
Education level	Primary School	4	3.6%	19	4.9%	23	4.6%	
	Secondary School	50	45.5%	183	47.4%	234	47.0%	
	Diploma	51	33.9%	154	39.9%	192	38.6%	χ^2 = 8.665**
	Degree	38	17.0%	30	7.8%	49	9.8%	
	Total	112	100.0%	386	100.0%	468	100.0%	

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.
Sources: Author's calculations.

Experience before running business	No	34	30.4%	119	30.8%	153	30.7%	
	Yes	78	69.6%	267	69.2%	345	69.3%	χ^2 = 0.009
	Total	112	100.0%	386	100.0%	498	100.0%	
Household size	3 or fewer people	29	25.9%	64	16.6%	93	18.7%	
	4 people	37	33.0%	109	28.2%	146	29.3%	
	Over 5 people	46	41.1%	213	55.2%	259	52.0%	χ^2 = 9.545**
	Total	112	100.0%	386	100.0%	498	100.0%	
Income earner	1-2	51	45.5%	128	33.2%	179	35.9%	
	3-4	42	37.5%	180	46.6%	222	44.6%	
	Over 4	19	17.0%	78	20.2%	97	19.5%	χ^2 = 8.640*
	Total	112	100.0%	386	100.0%	498	100.0%	
Household income	RM1000-RM2000	4	3.6%	17	4.4%%	21	4.2%	
	RM2001-RM3000	4	3.6%	40	10.4%	44	8.8%	
	RM3,001 - RM4,000	10	8.9%	72	18.7%	82	16.5%	χ^2 = 13.367***
	Over RM4,000	94	83.9%	257	66.6%	351	70.5%	
	Total	112	100.0%	386	100.0%	498	100.0%	

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.
Sources: Author's calculations.

Table 3. Characteristics of the Sampled SMEs

		Non-microcredit Borrower (N_1=122)		**Microcredit Borrower (N_2=386)**		**All Respondent (N_3=508)**		**Statistical Test**
		Count (n_1)	**% to N_1**	**Count (n_2)**	**% to N_2**	**Sub-total (n_3= n_1+ n_2)**	**% to N_3**	
Age of firm	Less than 5 years	36	32.1%	35	9.1%	71	14.3%	
	5 to 9 years	50	44.6%	96	24.9%	146	29.3%	
	10 to 14 years	14	12.5%	161	41.7%	175	35.1%	χ^2 = 73.066***
	15 to 19 years	7	6.3%	66	17.1%	73	14.7%	
	More than 20 years	5	4.5%	28	7.3%	33	6.6%	
	Total	112	100.0%	386	100.0%	498	100.0%	
Types of ownership	Household business establishment	6	5.4%	9	2.3%	15	3.0%	
	Sole proprietorship	98	87.5%	341	88.3%	439	88.2%	
	Collective/ Co-operative	2	1.8%	3	0.8%	5	1.0%	χ^2 = 4.654
	Limited liability company	6	5.4%	33	8.5%	39	7.8%	
	Total	112	100.0%	386	100.0%	498	100.0%	
Sector	Manufacturing	28	25.0%	102	26.4%	130	26.1%	
	Service	78	69.6%	245	63.5%	323	64.9%	
	Agriculture	6	5.4%	39	10.1%	45	9.0%	χ^2 = 2.742
	Total	112	100.0%	386	100.0%	498	100.0%	

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.
Sources: Author's calculations.

4.2 Empirical Results

Before running the regression, we test for multicollinearity in the model using variance inflation factors (VIF) and test for heteroskedasticity using the Breusch-Pagan/Cook-Weisberg tests. Table 4 shows our model is free from multicollinearity, but has the presence of heteroscedasticity at the 1% level of significance. To correct for the heteroscedasticity problem, robust standard errors are computed using White-correction.

Table 4. Test for Multicollinearity and Heteroskedasticity

Mean VIF of multicollinearity	1.94 (<10)
Reject/Not reject H_o	Not reject
Breusch-Pagan/Cook-Weisberg	104.77 (0.000)
Reject/Not reject H_o	Reject at 1%

A logistic regression model (equation 11) with a maximum likelihood technique is employed to investigate the factors affecting SMEs' microcredit access. The dependent variable is the decision of the SME to borrow and is interpreted as accessibility to microcredit, with a value of 1 if the SME borrowed through microcredit and 0 otherwise. Table 5 presents the estimates of the logit model. There are 498 observations used to calculate the estimated coefficients. The likelihood ratio test has a Chi-square statistic equal to 138.73; thus, the null hypothesis (the parameter estimates for the model are equal to zero) is not accepted. Overall, the model fits the data well with 81.73% of correct predictions. Thus, the coefficients of the explanatory variables are useful in explaining the probability of Malaysian SMEs' microcredit access.

The last column in Table 5 presents the marginal effects, which illustrate the direct effect of the explanatory variables on the dependent variables, for the regressors of the logit model. A positive sign of marginal effect increases the probability of SMEs accessing microcredit, whereas a negative sign reduces the probability of SMEs accessing credit.

Based on the estimated results in Table 5, ten variables have a significant influence on SMEs' access to microcredit. Table 5 shows the married coefficient is positively significant at the 1% level which implies that married owners/managers have a slightly better probability of accessing microcredit than unmarried owners/managers. This effect is also documented in Beisland and Mersland (2012). The marginal effect of the married coefficient in Table 5 implies that being married increases the owner/manager's probability of accessing microcredit by 16.1%. This contrasts with Atta's (2012) finding that marital status does not influence access to credit. However, our finding aligns with Sebopetji and Belete (2009), which shows that being married has a significantly positive influence on credit access in South Africa. This relationship is reasonably explained in our study, because it is expected that married people have a family to accommodate, and therefore they perform better. They are also more responsible in running a business due to family commitments and responsibilities. One possible reason is that married people have a more stable income

and financial position than single people do and thus have better repayment capability to gain access to credit.

Table 5. Logit Results of SMEs' Accessibility to Microcredit

Variable	Coefficient	Robust SE	P-value	Marginal Effects
Constant	-2.502	1.288	0.052*	
Owner/Manager Characteristic				
Gender	0.229	0.321	0.475	0.027
Age $_{(2)}$	0.195	0.449	0.663	0.023
Age $_{(3)}$	-0.027	0.597	0.963	-0.003
Married	1.346	0.414	0.001***	0.161
Ethnicity	0.621	0.311	0.046**	0.074
Education	-0.040	0.276	0.884	-0.005
Received financial training	0.941	0.280	0.001***	0.112
Experience	0.390	0.324	0.229	0.047
Household Characteristic				
Household size$_2$	0.101	0.395	0.798	0.012
Household size$_3$	0.133	0.432	0.759	0.016
Income earner$_2$	-0.132	0.371	0.722	-0.016
Income earner$_3$	0.214	0.397	0.589	0.026
Household income	-0.596	0.226	0.008***	-0.071
SME Characteristic				
Age of enterprise	0.143	0.047	0.002***	0.017
Manufacturing sector	-0.273	0.518	0.598	-0.033
Service sector	-0.028	0.496	0.955	-0.003
Size of enterprise	-0.052	0.051	0.302	-0.006
Ownership	1.228	0.468	0.009***	0.147
Networking				
Commercial bank	0.101	0.113	0.375	0.012
NGOs	0.142	0.068	0.038**	0.017
MFI	0.324	0.087	0.000***	0.039
Business associations	0.203	0.119	0.088*	0.024
Distance in km	-0.041	0.012	0.001***	-0.005
No. of Observations	498			
Log Likelihood	-187.697			
Chi2 (22)	138.73			
Pseudo R2	0.2929			
Percent of correctly predicted	81.73			

Notes: 1. The dependent variable equals 1 if a SME has accessed microcredit and 0 otherwise.
2. A dummy variable in each group is dropped to avoid the dummy trap problem.
3. Robust SE stands for robust standard errors.
4. *, ** and***, represent the 10%, 5% and 1% significance level, respectively.

Source: Author's calculations.

To capture the ethnicity of the owner-manager, this study uses a dummy variable that equals one for Malay-owned enterprises and zero for other ethnicities. Interestingly, the result shows that the ethnicity of entrepreneurs is positive and significant at the 5% level. Table 5 shows Malay-owned enterprises have a higher probability to gain access to microcredit by 7.4% than other ethnicity-owned firms. This result is consistent with Akoten et al. (2006) who report that the majority ethnic group is able to conveniently seek finance compared to a minority ethnic group. This is supported by Bruder et al. (2011) whereby Germans with foreign citizenship or being born outside Germany are less likely to get finance credit. They are also granted smaller loans than domestic entrepreneurs. Indeed, the Malaysia government has been explicit in its intention to boost Malay participation in the entrepreneurial activities dominated by other ethnicities (Hamidon, 2008). Therefore, many microcredit programs have been designed to provide credit facilities to Malays. This situation is supported by Meza (2015) in that both Perbadanan Usahawan Nasional Berhad

(PUNB) and TEKUN Nasional exclusively maintain financing for Bumiputeras,[1] thus reducing the possibility of access by other ethnic groups, which thus perceive the process of accessing credit as being difficult.

This study also finds that taking financial management training significantly positively influences SME owners' access to microcredit at the 1% level, indicating that these SME owners have a 11.2% greater probability to access microcredit than owners with no training (see Table 5). This can be attributed to the financial literacy resulting from the training. Consequently, SME owners or managers are more financially literate than those who have not received financial management training. The lack of financial knowledge dampens borrowers' access to credit regardless of credit being available in the market (Miller, 2009). Moreover, knowledge and skills about finance (i.e., financial management) provide microcredit providers with greater confidence that the credit given will be more profitably utilized and exhibit higher repayment capacity, thus improving access to credit. Fatoki and Asah (2011) suggest that training in credit management can help SME owners to design feasible investment plans and thus improve access to finance. For instance, financial training might be sufficient to help SMEs with the knowledge of finance and the skills to go through the borrowing process with microcredit providers. In addition, borrowers are empowered with skills and knowledge to make good financial decisions through financial training.

HJousehold size and number of income earners have no significant effect on SME microcredit access. Holding other factors constant, Table 5 shows a significantly negative sign on the household income variable, indicating that SMEs' access to microcredit increases with a decrease in household income. For one level decrease in household income, the probability of accessing microcredit increases by 7.1%. Higher-income households can be less financially constrained. Thus, they have less tendency to borrow through microcredit. This finding exhibits important evidence in the microfinance literature, because microcredit targets low income people, and thus it would be expected that low-income households have a higher probability to gain access to microcredit than do high-income households. This inverse relationship finding is consistent with Mohamed (2003) for Zanzibar and with Saqib, Kuwornu, Panezia, and Ali (2017) for Pakistan. Mohamed (2003) examines the relationship between household income and access to formal and quasi-formal credit, but finds a negative effect on credit access. Saqib et al. (2017) observe that individuals with high income have no demand for credit, because they can self-finance their operations using personal resources. The consistency with previous findings improves the credibility of our results. In addition, most microcredit programs in Malaysia exhibit eligibility criteria favoring enterprises with low household income.

The results show that firm age exhibits a positive and significant effect at the 1% level on the probability of SMEs accessing microcredit. For one level increase in an SME's age, the probability of accessing microcredit increases by 1.7%, because older firms have more experience in applying for loans (see Table 5). This result is

[1] Bumiputera is an ethnic group in Malaysia who are native Malays. They practice Malay customs and cover indigenous ethnic groups from Sabah and Sarawak who are protected by the country's constitution (Ismail, Bujang, Anthony Jiram, Abu Zarin, & Jaafar, 2015).

similar to Peprah and Ayayi (2016) who present that as the age of an enterprise increases the probability of accessing microcredit also increases. Mature enterprises benefit more from credit, because firm age can represent business sustainability and repayment ability. This argument is supported by Gemechu and Reilly (2011) who state that the estimated positive effects on firm age increase the likelihood that SMEs can obtain loans from banks and microfinance institutions. Winker (1996) indicates that firm age can reduce the possibility of credit rationing. Access to microcredit is not influenced by firm size, which is measured by the number of employees. Similarly, the business sector is not related to SMEs' access to credit.

The ownership structure shows unexpected results. Sole proprietorship exhibits a positive significant correlation with access to microcredit. Table 5 shows that an enterprise registered as a sole proprietorship increases the probability of access to microcredit by 14.7%, which is statistically significant at the 1% level. SMEs in Malaysia (81.55%) are dominated by sole proprietors (Department of Statistics Malaysia, 2011). Microcredit programs in Malaysia generally target micro-businesses and small enterprises, because they are more likely to have greater credit demands for working capital and investment in their firms. Moreover, 88.2% of respondents in our study are sole proprietors, which may affect our results. This finding supports Sampong (2011), who shows that people in Ghana who access microcredit are sole proprietors. Conversely, Kira and He (2012) note that sole proprietors face difficulties accessing finance, because a sole proprietorship business implies a high risk borrower as repayment of a loan solely depends on a single person.

The results show that by networking with social organizations or NGOs, microfinance institutions (MFIs) and business associations can positively affect microcredit accessibility, but not with formal commercial banks. This implies that the probability of accessing microcredit increases by 1.7% for SMEs that network with NGOs. NGOs occupy a niche as a financial intermediary in Malaysia. The marginal effect of networking with MFIs shows that the probability of accessing microcredit increases by 3.9% (see Table 5), because SMEs possibly receive better information on microcredit facilities offered by microfinance institutions. Atieno (2001) concludes that having an established network with credit institutions improves the terms and conditions of the loans in favor of small-scale enterprises, thus providing a good opportunity to facilitate access to credit. This finding supports other studies' findings that the closer the relationship is between the borrower and lender, the less difficulty there is in obtaining finance (Saleh & Ndubisi, 2006; Nguyen and Ramachandran, 2006).

Table 5 shows that networking with business associations is positive and significant at the 10% level, which demonstrates that networking with business associations plays a significant role in determining access to microcredit. Networking with business associations increases access to microcredit by 2.4%. Other members in business associations also support SMEs' access to financial services (Atieno, 2009). This is because membership in business associations involves information sharing. This finding is consistent with Gemechu and Reilly (2011) who argue that access to credit improves when an enterprise in Ethiopia networks among business

associations than for enterprises that have no relationship with business associations.

The distance variable, not surprisingly, is a strong determinant in accessing microcredit. It is significant at the 1% level (see Table 5). An increase in the distance from a microcredit provider reduces the probability of access to microcredit by 0.5%. The effect of distance to the nearest microcredit provider shows that SMEs that are close to microcredit providers have a better community relationship and are able to better develop social capital with them. Consequently, they have easy access to microcredit. In addition, it is well documented that further distances increase SMEs' transaction costs (Garikipati, 2012; Ibrahim & Bauer, 2013; Li et al., 2011).

5. Conclusions

The findings of this study help augment the current knowledge of SMEs in the literature. The factors that significantly affect their accessibility to microcredit are married, ethnicity, receiving financial training, household income, age of enterprise, ownership, and networking with non-governmental organizations (NGOs), MFIs, and business associations. The results show that financial training improves SMEs' chances to access microcredit, because the skills and knowledge of finance enable literate SMEs to provide microcredit providers with improved financial information and better repayment capacity.

It should be noted that networking is important for SMEs' access to microcredit. SMEs that have good interactions and networking can obtain reliable information from participants in their networks, most notably for NGOs, MFIs, and business associations. SME owners should acknowledge the negative effect of asymmetric information on their access to microcredit. Hence, they should become more active in building up good networking with microcredit providers. SME owners should also expand their networking skills, because this is particularly beneficial to them especially at gaining credit information or participating in programs with better access to microcredit.

The Malaysia government has initiated many programs to support the growth of SMEs. Therefore, it is the responsibility of SME owners to deepen their own learning. In this process, participating in financial training and development programs and having optimistic attitudes toward these trainings are key to their sustainability.

Many SMEs exclude themselves from microcredit borrowing if the distance to a microcredit provider is far from their residence. Microfinance institutions should consider the adoption of technology to help SME borrowers overcome this distance barrier. For instance, mobile phone finance allows borrowers to perform their financial transactions such as e-payments or to apply for microloans. Similarly, electronic banking (e-finance) enables SMEs to apply for microloans online. Telephone and e-finance can help reduce these transaction costs and provide the service more effectively.

This study interestingly exhibits imperative evidence in the microfinance literature, because microcredit targets low-income people. Thus, low-income households are more likely to access microcredit than high-income households. This

hence parallels the objective of microfinance to assist poor people.

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