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**Accessibility to microcredit and its impact on small and medium  
sized enterprises' performance in Malaysia**

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A thesis  
submitted in partial fulfilment  
of the requirements for the Degree of  
Doctor of Philosophy in Finance

at  
Lincoln University  
by  
Rafiatul Adlin Hj Mohd Ruslan

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Lincoln University

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Abstract of a thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy in Finance.

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by

Rafiatul Adlin Hj Mohd Ruslan

Small and medium-sized enterprises (SMEs) play a crucial role in Malaysia's economic growth by creating employment, generating income and stimulating growth. However, access to finance among SMEs lags behind larger enterprises, which obstructs the growth and development of SMEs. The limitation of the formal financial institutions in providing credit to low-income groups such as SMEs gave rise to microfinance programs. The Central Bank of Malaysia has designed a micro financial institution framework to provide a platform for SMEs to access microcredit. However, according to Department of Statistics Malaysia only 32.1% of SMEs obtained finance from the banks and microfinance institutions in 2016. Thus, access to microcredit remains the major challenge to most SMEs. However, access to microcredit among Malaysian SMEs is not well documented. Given such a background, this study aims to bridge the gap in the literature by investigating the determinants of Malaysian SMEs' accessibility to microcredit, since obtaining bank finance is not popular among small scale enterprises. Further, this study examines the relationship between access to microcredit and SMEs' performance.

The study employs logistic regression to investigate the determinants of accessibility to microcredit among SMEs. The results show being married, ethnicity, financial training, household income, age of the enterprise, ownership, networking with non-governmental organizations, networking with a microfinance institution, networking with business associations and distance of the business premises from the nearest microcredit provider are statistically significant in influencing SMEs' accessibility to microcredit.

In addition to determining the factors that influence accessibility to microcredit, this study attempts to determine the factors that affect the choice of microcredit providers such as commercial banks, development financial banks and microfinance institutions. Based on a multinomial logit model,

owner characteristics such as gender, age, marital status and ethnicity have less influence on determining microcredit provider choices. However, different lending characteristics of microcredit providers for loans such as loan amount, distance of the business premises from the microcredit provider, loan processing, loan duration and mode of interest payments are significant in influencing microcredit demand among borrowers.

This study also investigates the loan rate charged by microcredit providers for microloans. Analysis using ordinary least squares is performed to determine the factors that affect the finance rate charged to SMEs. The results show the rate charged on a microcredit loan can be explained by SME characteristics, loan characteristics, networking and creditworthiness.

The Propensity Score Matching (PSM) estimation which shows a positive impact of microcredit suggests that access to microcredit is of the utmost importance in improving SMEs' sales growth. After mitigating possible bias because of time-invariant unobservable factors based on the Difference-in-Difference method, the magnitude of the impact of microcredit on sales growth is relatively higher than PSM. However, the impact of microcredit on employment growth is unexpected. The endogenous switching regression model is used for dealing with endogeneity. The results are consistent with propensity score matching and difference-in-difference methods and, therefore, we can conclude that access to microcredit positively contributes to the performance of SMEs in Malaysia in terms of sales growth. However, this study does not find any significant relationship between the use of microcredit and employment growth.

**Keywords:** accessibility, impact, microcredit, SME, Malaysia, propensity score matching

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## Abbreviations

ADB	Asian Development Bank
AIM	Amanah Ikhtiar Malaysia
AIM	Amanah Ikhtiar Malaysia
ASEAN	Association of Southeast Asian Nations
ATT	Average Treatment Effect on the Treated
BNM	Bank Negara Malaysia
BSN	National Savings Bank
CG	Control Group
DFI	Development Finance Institution
DID	Diference-in-Difference
DOSM	Department of Statistics Malaysia
EG	Experimental Group
ESR	Endogenous Switching Regression
ETP	Economic Transformation Programme
GDP	Gross domestic product
IA	Impact Assessment
ICT	Information and Communication Technology
MFI	Microfinance Institution
MNL	Multinomial Logit Model
MSME	Micro-Small-Medium Scale Enterprises
NDP	National Development Policy
NEM	New Economic Model
NEP	New Economic Policy
NFI	Non-Financial Institutions (NFIs)
NSDC	National SME Development Council
OLS	Ordinary Least Square
PSM	Propensity Score Matching
PUNB	Perbadanan Usahawan Nasional Berhad
SME	Small and medium enterprise
SMEs	Small and medium enterprises
TEKUN	National Entrepreneur Economic Fund
UNCTAD	United Nations Conference on Trade and Development,
UNDP	United Nations Development Programme

# Chapter 1

## Introduction

### 1.1 Introduction

Small and medium enterprises (SMEs) play an important role in economic growth around the world, especially among developing countries, because they contribute to economic growth. SMEs positively contribute to Gross Domestic Product (GDP), employment creation, and entrepreneurial development of the economy (SME Corporation Malaysia, 2014; Tambunan, 2014). The development of SMEs is also linked to accelerating the achievement of wider economic and socio-economic objectives, including alleviating poverty (Cook, 2001). The SME sector provides an income for small entrepreneurs who generally come from low income groups (Rahman & Ahmad, 2010) and, thus, improves their living conditions. Moreover, SMEs are anticipated to create jobs, reduce poverty, and drive a resilient economy (Asian Development Bank, 2014).

Concern about SMEs' growth and development continues to be at the forefront of policy debates (Cook, 2001) as SMEs comprise most of the businesses in most developing countries. The latest statistics reported in the Economic Census the Profile of SMEs conducted by the Department of Statistics Malaysia revealed that SMEs in Malaysia constituted 98.5% of the 920,065 business establishments in 2016. The Association of Southeast Asian Nations (ASEAN)<sup>1</sup> member countries reflect a similar percentage in terms of SMEs' share of the total establishment. Table 1.1 shows that SMEs account for over 92% of total enterprises in ASEAN member countries. SMEs have significantly increased employment, such as 57.5% in Malaysia and 98% in Vietnam. In terms of GDP contribution, SMEs comprise 50% of the GDP in Singapore, 59.1% in Indonesia, and it ranges between 24% and 40% in other ASEAN countries. Malaysian SMEs' contribution to GDP increased from 32.2% in 2010 to 36.3% in 2015. Currently, SMEs in Malaysia continue to contribute to the Malaysian economy in the form of creating employment opportunities, generating income and stimulating growth.

Despite their contribution to the economy, SMEs face many difficulties in operating their businesses. Arinaitwe (2006) and Tehrani & White (2003) identified that financial constraint is the most crucial problem encountered by micro and small enterprises. This problem is related to a lack of internal

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<sup>1</sup> ASEAN is an organization of countries in Southeast Asia that set was up for economic and political cooperation. ASEAN was officially formed in 1967 and consists of 10 ASEAN member countries; Malaysia, Philippines, Singapore, Thailand, Indonesia, Brunei Darussalam, Vietnam, Myanmar, Lao PDR, and Cambodia.

funds and limited access to commercial loans offered by financial institutions (Wydick, 1999). Most banks in developing countries prefer to offer loans to large companies or well-established businesses

**Table 1.1 The number of establishments, employment share and GDP of SMEs in ASEAN members**

ASEAN Members	No. of establishments	Percentage	Employment share	GDP	YEAR
Brunei	-	98.23%	59.00%	24.00%	2010
Cambodia	36,116	98.46%	-	-	2009
Laos	216,913	99.83%	81.40%	-	-
Indonesia	57,900,000	99.99%	97.00%	59.10%	2013
Malaysia	662,939	97.30%	57.50%	33.10%	2013
Myanmar	43,503	91.99%	-	-	2007
Philippines	940,886	99.60%	65.00%	-	2012
Singapore	-	99.00%	70.00%	50.00%	2015
Thailand	2,760,000	97.16%	80.96%	37.40%	2013
Vietnam	723,000	95.27%	97.60%	40.00%	2013

Source: Directory of Outstanding ASEAN, 2015

that have a good credit history and valuable collateral (Gallardo, 1997). A lack of collateral prevents SMEs from obtaining finance because they do not have significant or valuable (and resaleable) assets (Khalid & Abd Wahab, 2014). Banks require collateral with high value to compensate for the risks they take. The not well-established SMEs are viewed as unattractive borrowers because they are regarded as high risk for the banks and can easily default. Also, the lack of information regarding the availability of credit facilities provided (Kessey, 2014) and not maintaining a good network or lack of personal contacts with other people (Ahmad & Seet, 2009) prevent access to credit by SMEs.

Previous research has revealed that access to credit is a vital funding source needed by SMEs (Akoten, Sawada, & Otsuka, 2006; Beck et al., 2014; Harvie, Narjoko, & Oum, 2013). Notably, there is convincing evidence that access to credit provides benefits to businesses and impacts business growth. For instance, the availability and accessibility of finance influence the successful performance of SMEs (Abdullah & Ab. Manan, 2011). This is because access to credit allows SMEs to expand their businesses, acquire the latest technology and undertake productive investments, thus ensuring their competitiveness (Ajagbe, 2012). SMEs are not only unsustainable because of poor accessibility to credit, but also their profitability and growth are likely to be relatively lower than large firms (Akoten et al., 2006). SMEs that cannot access external financing because of their limitations, such as no collateral or their lack of creditworthiness and high enterprise risk, are affected in their overall profitability and growth.

Recognition of the potential contribution of credit to enhance the growth of SMEs and the limitation of the formal financial institutions in providing credit to low-income groups such as SMEs gave rise to microfinance programs. Professor Muhammad Yunus introduced microcredit to Bangladesh when he

discovered that the low-income group, especially poor people who are unbankable, were not able to improve their standard of living because of a lack of capital. For that reason, he suggested that poor people could improve their income and standard of living if capital were given to them. The objective of his project was to provide loans, i.e., structured loans, to poor people to expand banking facilities. The success of microfinance in Bangladesh has culminated in the adoption of this model and its implementation in Asia, Africa and the US (Hulme & Moore, 2007). In Malaysia, the Malaysian central bank, Bank Negara Malaysia (BNM), introduced a Microfinance Institutional Framework<sup>2</sup> in August 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 a no collateral requirement, minimal documentation including reduction in the duration of approval and disbursement of funds, microcredit is deemed affordable (Nawai & Mohd Shariff, 2011). The first microfinance institution in Malaysia was Amanah Ikhtiar Malaysia (AIM), established in 1987. The microcredit provided by AIM has given poor people the opportunity to grow and be independent through self-employment. Consequently, AIM members can generate income and improve their standard of living and no longer live in poverty (Chan & Abdul Ghani, 2011).

Microfinance programmes and SMEs are interconnected because most microfinancing programme participants are small entrepreneurs. Thus, microcredit benefits not only households but also SMEs (Vos, Yeh, Carter, & Tagg, 2007). Similar findings are echoed in Abdulsalam and Tukur's (2014) study, which demonstrates the impact of microcredit on small enterprise growth in Nigeria. They found that firms acquired valuable assets, such as machines and equipment, for their businesses after they received microcredit, and continued to record high turnover and profit. Similarly, Mamun, Abdul Wahab, and Malarvizhi (2010) measured the impact of a microcredit programme in Malaysia and found that it led to increased use of raw materials and the assets of the microenterprise. Although studies on the impact of credit have helped SMEs to grow, Nguyen's (2014) study shows contrariwise. The author analysed the impact of credit access on Vietnamese SMEs and found access to credit does not influence SMEs' growth. Similarly, Mokhtar and Ashhari (2015) highlighted that a microcredit loan cannot be used as a measure of success in business.

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<sup>2</sup> For further discussion on the Malaysian microfinance institutional framework, see Chapter 2.

## 1.2 Problem Statement

Poor access to finance may ruin a good business idea and thus limit the ability of SMEs to grow and survive in the market. The role of finance has been observed as a vital component of SMEs' development (Cook, 2001). Credit inaccessibility can impede the development of SMEs and retard Malaysia's economic development. This is because the performance of SMEs enhances employment, improves the standard of living and GDP growth. Without access to credit, small and medium businesses are not able to invest in new equipment and inputs for production. Furthermore, they are not able to hire workers, and this may prevent the development and sustainability of their businesses. The productivity level, funding and rising cost of operations prevent most SMEs from being profitable, albeit there is a vast market potential for SMEs in Malaysia (SME Corporation Malaysia, 2014).

Ab. Wahab and Buyong (2008) studied financing practices and challenges among SMEs in Malaysia and discovered 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, which is referred to as a finance gap between SMEs and financial institutions (Beck & Demirguc-Kunt, 2006; Domeher, Musah, & Hassan, 2017; Stiglitz & Weiss, 1981). The financing gap refers to a condition where an enterprise has lucrative business opportunities but inadequate funds, either from internal or external sources, to take advantage of opportunities (Daskalakis, Jarvis, & Schizas, 2013) that enhance enterprise growth. The financing gap exists because of the existence of high levels of information asymmetry. The SME Corporation Malaysia (2013) reported that banks reject loans to SMEs because of a poor track credit record (33%), poor sales and earnings or insufficient cash flow (30%) and having too high leverage or outstanding loans (24%). Apart from these, lack of collateral and insufficient documents to support a loan application are some of the constraints that Malaysian SMEs faced in accessing finance (Aris, 2007). This is because most SMEs do not have valuable collateral securities and they fail to provide adequate information on their business and financial plans to obtain loans.

The Malaysian government has implemented initiatives to support access to credit for SMEs by considering microfinancing as one innovative support way. After its official establishment in 2006, the microfinance industry in Malaysia expanded and provided access to credit to SMEs that lack access to traditional banks, with the expectation of increasing accessibility and sufficiency of credit to them and to bridge the financing gap. Unfortunately, the Census of the Profile of SMEs conducted by the Department of Statistics Malaysia in 2011 and 2016 reported that only 21.9% and 32.1% respectively of SMEs in Malaysia receive formal financing such as from banks, financial and microfinance institutions (Department of Statistics Malaysia, 2011, 2016). The main source of SMEs' finance in Malaysia is from internal funds such as borrowing from relatives, friends, or pawnshops.

The major barriers to the growth and development of SMEs, as cited in the literature, include a lack of sufficient finance and access to credit (Zabri & Lean, 2014). It is estimated that close to 95% of most SMEs rely on personal resources of their owners and/or loans from friends and relatives to finance their enterprises. This is evidence that the factor obstructing SME growth is access to credit (UNDP, 2007).

Given the importance of credit and the existence of constraints related to access to credit among Malaysian SMEs, it is crucial to determine financial practices among SMEs to provide a better understanding of their financing behaviour. Previous researchers have focussed on the accessibility of credit from various forms of financing (Akoten et al., 2006; Harvie et al., 2013; Khalid & Abd Wahab, 2014) but not specifically on microcredit. The difficulty in accessing microcredit is under researched (Woldie, Mwita, & Saidimu, 2012). Therefore, the limited research on the accessibility to microcredit among SMEs in Malaysia motivates this study. The impact of microcredit on education, consumption and expenditure (Chirkos, 2014; Li, Gan, & Hu, 2011b; Mamun, Malarvizhi, Hossain, & Hooi Tan, 2012) is receiving attention in the literature but the impact of microcredit on the performance of SMEs is still lacking. Studies in Malaysia have paid little attention to the impact of microcredit accessibility on the performance of SMEs. The Malaysian government has launched several microcredit programmes and schemes to boost SME activity and development. Hitherto, the impact of microcredit on SMEs is under explored. Given such a background, the purpose of this study is to bridge the gap in the literature by exploring the determinants of microcredit accessibility and their impact on enhancing SMEs' performance in Malaysia.

### **1.3 Research Questions**

The research questions of this study are:

1. What determines the accessibility to microcredit by SMEs in Malaysia?
2. What factors determine the choice of microcredit providers by SMEs in Malaysia?
3. What factors determine the microcredit loan rate<sup>3</sup> charged to SMEs in Malaysia?
4. How does microcredit impact on the performance of SMEs in Malaysia?

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<sup>3</sup> This study uses the term loan rate instead of interest rate since this study does not separate between Islamic and conventional microcredit (see Beck, Demirguc-Kunt, & Merrouche (2013) and Haron & Ahmad, (2000) for further details on Islamic and conventional finance)



## **1.4 Research Objectives**

The research objectives are:

1. To identify the determinants that influence the accessibility of microcredit by SMEs in Malaysia.
2. To examine the factors influencing the choice of microcredit providers by SMEs in Malaysia.
3. To determine the factors that affect the microcredit loan rate charged to SMEs in Malaysia.
4. To evaluate the impact of microcredit on the performance of SMEs in Malaysia.
5. To provide policy implications from the research findings.

## **1.5 Data and Method**

Primary data were collected through a structured questionnaire administered to SMEs in Terengganu, Malaysia. Terengganu is a state in Malaysia that exhibits a relatively higher incidence of poverty and is considered as a less developed region.

The study uses four criteria to select the respondents for the study. They are: (1) the owner/manager of the firm; (2) not a new business; (3) the business must have 5 to 200 employees for the manufacturing sector and 5 to 75 employees for the service sector; and (4) the SME is not part of a larger firm such as a franchising company.

The following econometric methods were employed in this study to answer the research objectives:

1. A logit model to determine the determinants of microcredit accessibility;
2. A multinomial logit model to determine the choice of microcredit provider by SMEs;
3. A multiple regression model to examine the factors that affect the loan rate charged on a microloan;
4. Propensity score matching, difference-in-difference and endogenous switching regression models to investigate the impact of microcredit on SMEs' performance. Different techniques are used because endogeneity and selection bias are associated with the analysis of the impact of access to microcredit.

The performance of SMEs is measured by sales and employment growth (Akoten et al., 2006; Ayyagari, Demirgicc-Kunt, & Maksimovic, 2010) between 2012 and 2014. In this study, sales growth is defined as the log of change in total sales between 2012 and 2014. Sales growth and employment

growth measured the performance of the SMEs because those variables are the fundamental starting point for determining the performance of an enterprise.

There are limited literature on SMEs access to microcredit between 2012 and 2014. Some studies focused on access to credit on small enterprises (Khalily & Khaleque, 2013; Atandi & Wabwoba, 2013) but not specifically on microcredit. An increasing number of SMEs need access to microcredit; nevertheless, accessibility is still low, especially in developing countries (Hussain et al. 2006). It is essential to understand the borrowing behaviour and attributes of the SMEs towards microcredit. Even though, access to microcredit among small enterprises has been investigated by Abdulsalam & Tukur in 2014, however, a drawback of the study is the use of minimum quantitative analysis (multiple linear regression). The study utilizes an econometric technique that allows a quantitative measure of the effects of the explanatory variables on the dependent variable.

## **1.6 Significance of the study**

The main objective of the current study is to add knowledge and improve our understanding of the accessibility to microcredit by SMEs, particularly among SMEs in Malaysia. This study also aims to gauge the effect of microcredit accessibility and SMEs' performance in Malaysia.

Since SMEs have important implications for long-term economic growth and development, it is important to understand the determinants that influence accessibility to microcredit by SMEs. This study will contribute to the development of the microfinance sector in Malaysia. Studies on microfinance are crucial for the development of socio-economic activities in developing countries, particularly their contribution to the development of SMEs. To the best of the researcher's knowledge, the empirical analyses of the impact of microcredit on SMEs' performance are limited. Therefore, this study bridges a gap by empirically investigating the relationship between accessibility to microcredit and SMEs' performance. A better understanding of microcredit or the financial practices of SMEs in Malaysia will benefit the government, lenders and private bodies to provide better financial services, particularly on the accessibility of microcredit by SMEs to enhance their performance.

## **1.7 Structure of the thesis**

This thesis is divided into six chapters. Chapter 2 provides an overview of SMEs and microcredit including the definitions used in defining SMEs in selected countries and in Malaysia. In addition, SMEs' contributions and challenges in accessing credit are also discussed, together with the background of microcredit. Chapter 3 reviews the literature on SMEs, access to credit and the impact of microcredit. Chapter 4 discusses the empirical model, the estimation technique and the data collection method of the study. The empirical results and findings are presented in Chapter 5 and

Chapter 6 summarizes the major findings and conclusion of the study, as well as the limitations of the research, and suggestions for future research.

## Chapter 2

### A Review of Small and Medium Enterprises and Microfinance

This chapter provides an overview of small and medium enterprises (SMEs) and microfinance, particularly microcredit. Section 2.1 defines SMEs globally and in Malaysia. Next, Section 2.2 discusses the development of SMEs, the contributions and the challenges faced by SMEs particularly in Malaysia. Section 2.3 provides an overview of the history and development of microcredit in Malaysia. Section 2.4 summarises the chapter.

#### 2.1 Definition of Small and Medium Sized Enterprises

The definition of SMEs differs across countries because each country uses various criteria to classify SMEs. The most common classifications are based on the number of employees, sales turnover and total assets. Table 2.1 lists the definition of SMEs for selected countries. In Canada, firms are considered small when the number of employees is under 500 people; the European Union<sup>4</sup> countries set the limit at 250 employees (Lindner & Bagherzadeh, 2005). In China, the definition of SMEs is quite complex. Normally, as shown, most countries categorise SMEs based on the number of employees; the range is between fewer than 100 and 500 employees. In contrast, for the industrial sector in China, SMEs employ a maximum of 2000 people and the revenue and total assets are less than RMB300 million and RMB400 million, respectively. Medium enterprises hire a minimum of 300 people with annual total revenue and assets not exceeding RMB30 million and RMB40 million, respectively (Liu, 2008).

**Table 2.1 Definition of SMEs in Selected Countries**

Country	Definition of SMEs	
Canada <sup>a</sup>	1-499 employees	
European Union <sup>a</sup>	Annual turnover below EUR 50 million and/or balance sheet below EUR 43 million with fewer than 250 employees.	
Russia <sup>a</sup>	Turnover not more than RUB 1000 million and fewer than 250 employees	
China <sup>b</sup>	Depends on the industry category and is based on annual revenue, total assets, and number of employees.	
	<b>Industrial sector:</b> Annual revenue not exceeding RMB300 million, total assets should not exceed RMB 400 million; maximum 2,000 people,	<b>Medium-sized enterprises</b> Annual revenue not exceeding RMB30 million, total assets should not exceed RMB40 million; minimum of 300 people

Source: (a) Lindner and Bagherzadeh (2005); (b) Liu (2008)

<sup>4</sup> European Union countries: Austria, Belgium, Bulgaria, Croatia, Czech Republic, Republic of Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the UK.

### **2.1.1 Definitions of SMEs in the Association of Southeast Asian Nations (ASEAN)**

Table 2.2, Table 2.3 and Table 2.4 list the definitions of SMEs across ASEAN countries according to micro, small and medium sized. Each ASEAN member defines SMEs differently. Thailand and Vietnam define SMEs by sector whereas other member countries adopt a single SME category. Several criteria are used to define SMEs in these countries, such as the number of employees, total assets, sales turnover and capital.

Six countries, Brunei, Cambodia, Myanmar, Singapore, Thailand and Vietnam, use the number of employees, which is common in defining SMEs. The number of employees is determined by each country. Brunei defines SMEs by the size of the enterprise and solely categorises them based on the number of workers. For example, micro-enterprises are those businesses having 1 to 5 workers, small enterprises are those businesses having 6 to 50 workers, and medium enterprises are those businesses having 51 to 100 workers. Singapore uses a maximum of 200 employees for all sizes of enterprise. Cambodia, Myanmar and Vietnam set a limit of 10 people (ASEAN, 2015).

Except for Brunei, ASEAN countries use additional criteria, such as total assets, sales turnover and capital. Total assets and sales turnover are used in defining SMEs in Indonesia but vary by the size of the enterprise. Interestingly, the definition of SMEs in Myanmar includes an industry-focused indicator of power measured in horsepower and capital, but varies across sectors (ASEAN, 2015). The Philippines uses the value of assets to define SMEs and the criterion differs for each size of enterprise. Only Laos does not differentiate between small and microenterprises. It uses three criteria to differentiate between small and medium: the number of employees, sales turnover and asset value.

Table 2.2 Definitions of SMEs in the Association of Southeast Asian Nations (ASEAN) - Micro

ASEAN Members	SME DEFINITION			
	No. of employees	Sales Turnover	Assets	Others
<b>Brunei</b>	1-5			
<b>Cambodia</b>	Fewer than 10		Less than 50,000 (USD)	
<b>Indonesia</b>		Less than IDR 300 million	Less than IDR 50,000,000	
<b>Laos</b>				
<b>Myanmar</b>	Fewer than 10			Horsepower: Less than 3 horsepower
<b>Philippines<sup>5</sup></b>	1-9		PHP 3000000 or less	
<b>Singapore</b>	Not more than 200	Not more than SGD100 million		
<b>Thailand</b>	Manufacturing: 50 Trade (Wholesale): 25 Trade (Retail):15 Service: 50		<u>Manufacturing</u> 50 million Baht <u>Trade (Wholesale)</u> 50 million Baht <u>Trade (Retail)</u> 30 million Baht <u>Service</u> 50 million	
<b>Vietnam</b>	<u>Agriculture, forestry and fishery sector</u> Fewer than 10 <u>Industrial and Construction</u> Fewer than 10 <u>Trade and services</u> Fewer than 10			

Source: Directory of Outstanding SMEs 2015 (ASEAN, 2015)

<sup>5</sup> National Statistics Office and Small and Medium Enterprise Development Council Resolution No. 1, Series 2003.

**Table 2.3 Definitions of SMEs in the Association of Southeast Asian Nations (ASEAN) - Small**

ASEAN Members	SME DEFINITION			
	No. of employees	Sales Turnover	SMALL Assets	Others
<b>Brunei</b>	6-50			
<b>Cambodia</b>	11 to 50		50 to 250,000 (USD)	
<b>Indonesia</b>		IDR300 million up to 2.5 billion	IDR 50 million up to 500 million	
<b>Laos</b>	Fewer than or equal to 19	Fewer than or equal to 400 million kip	Less than or equal 250 million kip	
<b>Myanmar</b>	10 to 50	Up to 2.5 Kyat million per year		Horse Power: 3 to 25 horsepower Capital: Up to 1 Kyat million
<b>Philippines</b>	10-99			
<b>Singapore</b>	Not more than 200	Not more than SGD100 million		
<b>Thailand</b>	<u>Manufacturing</u> 50 – 200 million Baht <u>Trade (Wholesale)</u> 26 – 50 million Baht <u>Trade (Retail)</u> 16 – 30 million Baht <u>Service</u> 51 -200 million Baht		<u>Manufacturing</u> 50 – 200 million Baht <u>Trade (Wholesale)</u> 50 – 100 million Baht <u>Trade (Retail)</u> 30 – 60 million Baht <u>Service</u> 50 – 200 million Baht	
<b>Vietnam</b>	<u>Agriculture, forestry and fishery sector</u> Over 10 and under 200 <u>Industrial and Construction</u> Over 10 and under 200 <u>Trade and services</u> Over 10 and under 50			<u>Agriculture, forestry and fishery</u> Less than or equal to VND 20 billion <u>Industrial and Construction</u> Less than or equal to VND 20 billion <u>Trade and services</u> Less than VND 10 billion

Source: Directory of Outstanding SMEs 2015 (ASEAN, 2015)

Table 2.4 Definitions of SMEs in the Association of Southeast Asian Nations (ASEAN) - Medium

ASEAN Members	SME DEFINITION			
	No. of employees	Sales Turnover	MEDIUM Assets	Others
<b>Brunei</b>	51 to 100			
<b>Cambodia</b>	51 to 100		250 to 500,000 (USD)	
<b>Indonesia</b>		IDR 2,500,000,000 to 50,000,000,000	IDR 500,000,000 to 10,000,000,000	
<b>Laos</b>	More than 19 to 99		Less than or equal to 1.2 billion kip	
<b>Myanmar</b>	51 to 100	Over 2.5 to 10 Kyat million per year		<b>Horsepower:</b> 26 to 50 horsepower <b>Capital:</b> 1 to 5 Kyat million
<b>Philippines</b>	100-199		PHP 15,000,001 to 100,000,000	
<b>Singapore</b>	Not more than 200	Not more than SGD100 million		
<b>Thailand</b>				
<b>Vietnam</b>	<u>Agriculture, forestry and fishery sector</u> Over 200 under 300			<b>Capital:</b> <u>Agriculture, forestry and fishery</u> Over 20 under VND 100 billion
	<u>Industrial and Construction</u> Over 200 under 300			<u>Industrial and Construction</u> Over 20 and under VND 100 Billion
	<u>-Trade and services</u> Over 50 and under 100			<u>Trade and services</u> Over 10 and under VND 50 billion

Source: Directory of Outstanding SMEs 2015 (ASEAN, 2015)



## 2.1.2 Definition of Small and Medium-Sized Enterprises in Malaysia

In Malaysia, the common definition for SMEs was introduced in 2005. A business is classified as an SME if it meets one of two criteria, namely, the number of full-time employees or the annual sales turnover, whichever is lesser. However, the National SME Development Council (NSDC) endorsed a new definition for SMEs in Malaysia effective from 1 January 2014. Table 2.5 shows the old definition of SMEs in Malaysia and Table 2.6 shows the new definition. The change in the definition includes an increased share of SMEs to the total establishments from 97.3% to 98.5% (Bank Negara Malaysia, 2013). The change involves both the number of employees and an increase in sales turnover between 20% and 50%. The government sets the sales turnover for micro-enterprises at RM300, 000 from RM250, 000 (see Table 2.6).

**Table 2.5 Old Definitions of SMEs in Malaysia (2005-2013)**

Category	Manufacturing	Services and Other Sectors
Micro	Sales turnover: less than RM250, 000. Full-time employees: fewer than 5 people.	Sales turnover: less than RM200,000 Full-time employees: fewer than 5 people
Small	Sales turnover: from RM250, 000 to RM10 million. Full-time employees: 5 to 50 people.	Sales turnover from RM200, 000 to RM1 million. Full-time employees: 5 to 20 people.
Medium	Sales turnover: from RM10 million to RM25 million. Full-time employees: from 51 to 150 people.	Sales turnover from RM1 million not exceeding RM5 million. Full-time employees: from 20 to 50 people.

Source: SME Annual Report 2012 and 2013

**Table 2.6 New Definitions of SMEs in Malaysia**

Category	Manufacturing	Services and Other Sectors
Micro	Sales turnover: less than RM300, 000. Full-time employees: fewer than 5 people.	Sales turnover: less than RM300, 000. Full-time employees: fewer than 5 people.
Small	Sales turnover: from RM300, 000 to less than RM15 million. Full-time employees: 5 to 74 people	Sales turnover: from RM300, 000 to RM3 million. Full-time employees: 5 to 30 people.
Medium	Sales turnover: from RM15 million not exceeding RM50 million. Full-time employees: 75 to 200 people.	Sales turnover: from RM3 million not exceeding RM20 million. Full-time employees: 30 to 75 people.

Source: SME Annual Report, 2015

## 2.2 Small and Medium Sized Enterprises in Malaysia

Historically, before 1957, the Malaysian economy depended on primary goods, such as palm oil, rubber and tin, to generate growth and employment. Since independence in 1957, the Malaysian economy has developed rapidly and transitioned from agriculture to industry. Malaysia has successfully transformed from depending on exports of raw materials into a more multi-sector industrialised economy, including manufacturing and services. Nevertheless, many foreign investors withdrew their investments leaving the Malaysian economy in an unstable situation during the financial crisis in 1997 (Alhabshi, Abd. Khalid, & Bardai, 2009). However, SMEs, despite being isolated, managed to generate energy into the sluggish economy. Over the past decade, the contribution and the role of SMEs has been clearly acknowledged as the backbone of economic growth in Malaysia. The SME development has had increased interest from policymakers and has been placed high on the government agenda. For example, the policies in the New Economic Model (NEM), Economic Transformation Programme (ETP), and the Tenth and Eleventh Malaysia Plans concentrate on the role of SMEs to boost economic growth. In addition, the SME Masterplan (2012-2020) was introduced in July 2012 to raise the SMEs' contribution to GDP to 41% by the year 2020 (SME Corporation Malaysia, 2015)

In 2016, the Economic Census- Profile of SMEs reported there were 907,065 SMEs operating in Malaysia, representing 98.5% of the total businesses. The remainder are large firms totalling 13,559 (1.5%). SMEs in Malaysia are involved in services, manufacturing, construction, agriculture, and mining and quarrying. The largest SMEs are concentrated in the services sector with 809,126 establishments (89.2%), followed by the manufacturing sector with 47,698 SMEs (5.3%), 39,158 SMEs (4.3%) in the construction sector, and 10,218 (1.1%) in the agricultural sector (Department of Statistics Malaysia, 2016).

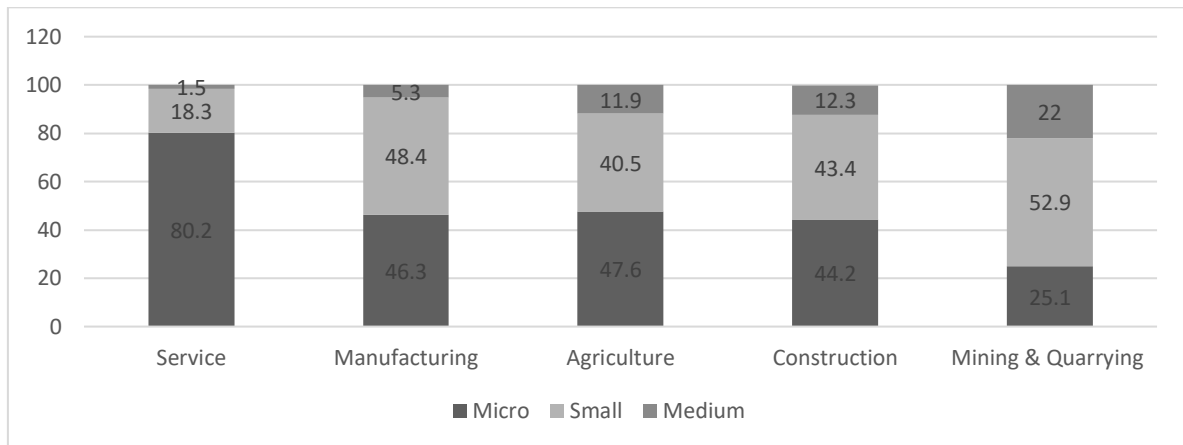
Based on the size of the enterprise, most SMEs are microenterprises. There are 693,670 microenterprises representing 76.5% of the total SMEs in the country. Small size enterprises are represented by 192,783 establishments (21.2%) followed by 20,612 medium-sized establishments (2.3%) (Department of Statistics Malaysia, 2016) (see Table 2.7).

**Table 2.7 The Percentage Share and Number of SMEs by Size**

	<b>MICRO</b>	<b>SMALL</b>	<b>MEDIUM</b>	<b>TOTAL</b>
No. of establishments	693,670	192,783	20,612	907,065
% share of total SMEs	76.5	21.2	2.3	100.0

Source: (Department of Statistics Malaysia, 2016)

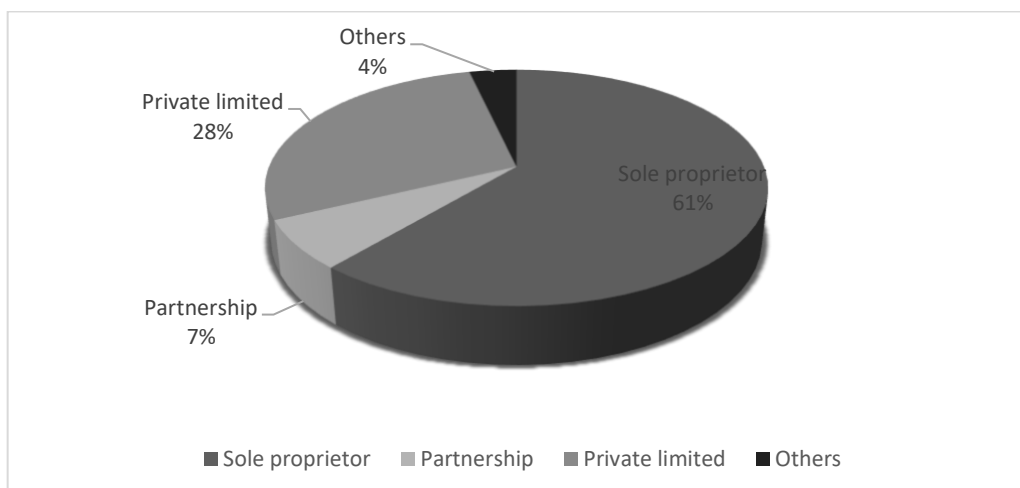
Figure 2.1 shows that most SMEs in the services sector are micro (over 80.2% of the total number of SMEs in the service sector). This is followed by small-sized establishments (18.3%), and medium-sized (1.5%). The manufacturing sector also shows that small-sized enterprises dominate accounting for almost half of the total establishments (46.3%). Microenterprises are nearly half of the business operators in the agricultural sector (47.6%). The mining and quarry sector is dominated by small and medium-sized businesses that comprise 52.9% and 25.1% of microenterprises; medium-sized businesses are 22.0% (Department of Statistics Malaysia, 2016).



**Figure 2.1 Percentage Share of SMEs by Size and Business Sector**

Source: (Department of Statistics Malaysia, 2016)

In terms of legal status (see Figure 2.2), sole proprietorship dominates, accounting for 61% of SMEs. That status is followed by private limited (28%), partnership (7%) and others (4%).



**Figure 2.2 The Proportion of SMEs by Legal Status**

Source: (Department of Statistics Malaysia, 2016).

### 2.2.1 Contributions by SMEs in Malaysia

Until now, the performance of SMEs has continued, encouraged and driven by the service, manufacturing and construction sectors. SMEs have improved over the years with their contribution to GDP increasing steadily from 29.6% in 2005 to 36.6% in 2016 (SME Corporation Malaysia, 2017). In terms of sectoral contribution, SMEs' share of GDP in 2016 was mainly contributed by the services sector (59.6%) supported by the manufacturing sector (21.6%), the agricultural sector (11.2%), and other sectors (6.2%) (See Table 2.8).

**Table 2.8 SMEs' GDP Share in 2016 by Key Economic Activity**

SME GDP share in 2016	
Economic activity	Percentage share of total
Overall	36.6
Agriculture	4.1
Manufacturing	7.9
Services	21.8
Other sectors	3.7

Source: SME Corporation Berhad (2017)

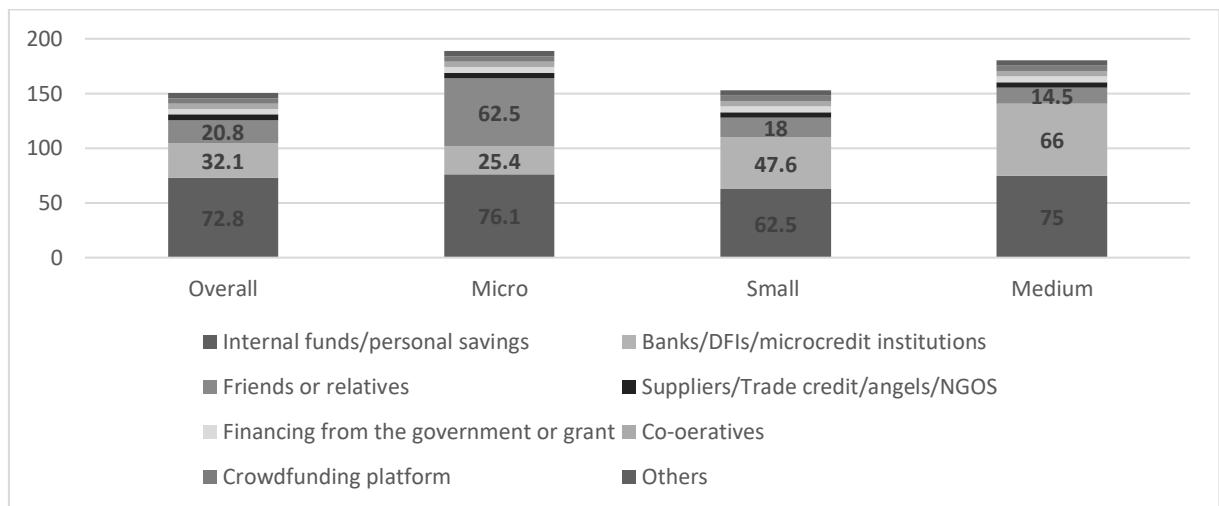
Besides the contribution to GDP, SMEs are a source of employment (Cunningham & Rowley, 2007) because they create many job opportunities for the large Malaysian population. Malaysian SMEs' total labour force grew 3.2% compared with 0.4% for large companies, and in 2015 their share of the nation's labour force rose to 57.5% from 57.1% in 2013 (SME Corporation Malaysia, 2014). In addition, the share of SME employment to total employment increased from 64.5% in 2015 to 65.3% in 2016. The services sector recorded the largest contribution of SME employment at 63.0% followed by manufacturing (16.5%), construction (10.4%), agriculture (9.8%) and mining & quarrying (0.3%) (SME Corporation Malaysia, 2017). These figures show the importance of SMEs in shaping the Malaysian economic landscape.

### 2.2.2 Challenges Facing SMEs in Malaysia

In spite of the contribution of SMEs to the economy, the challenges faced by SMEs in Malaysia have been highlighted in many studies (Abdullah & Ab. Manan, 2010, 2011; Haron, Said, Jayaraman, Ismail, 2013; Muridan & Ibrahim, 2016). The challenges faced by SMEs include limited access to better technology, and information and communication technology (ICT). SMEs can increase the efficiency and productivity of their business by adopting ICT tools. However, the use of ICT tools is relatively low among Malaysian SMEs (SME Corporation Malaysia, 2014). They perceive that the implementation of ICT involves complex procedures and is expensive and risky to implement in their

businesses because they suffer from budget constraints. Saleh and Ndubisi (2006) identify that limited human skilled resources, low levels of technology capability, high levels of international competition and low levels of research and development are the challenges faced by SMEs in Malaysia. Overcoming these challenges involves high cost; for example, it is costly to employ a professional or competent workforce. SMEs are unable to cope with these challenges because of a lack of finance.

Therefore, the lack of access to credit is a major challenge faced by SMEs in Malaysia. According to Rozali, Talib, Latif and Salim (2006), SMEs in Malaysia face credit problems especially for start-up and development of their businesses. The recent economic census of SMEs conducted by the Department of Statistics Malaysia (DOSM) reports SMEs depend heavily on their internal and personal funds for the main source of finance for credit (72.8%) (see Figure 2.3). Most SMEs in Malaysia are micro-enterprises but only 25.4% of micro-enterprises obtain finance from banks, or development finance and microcredit institutions. Financing from other sources includes pawnshops, leasing, factoring, venture capital, and licensed money lenders.



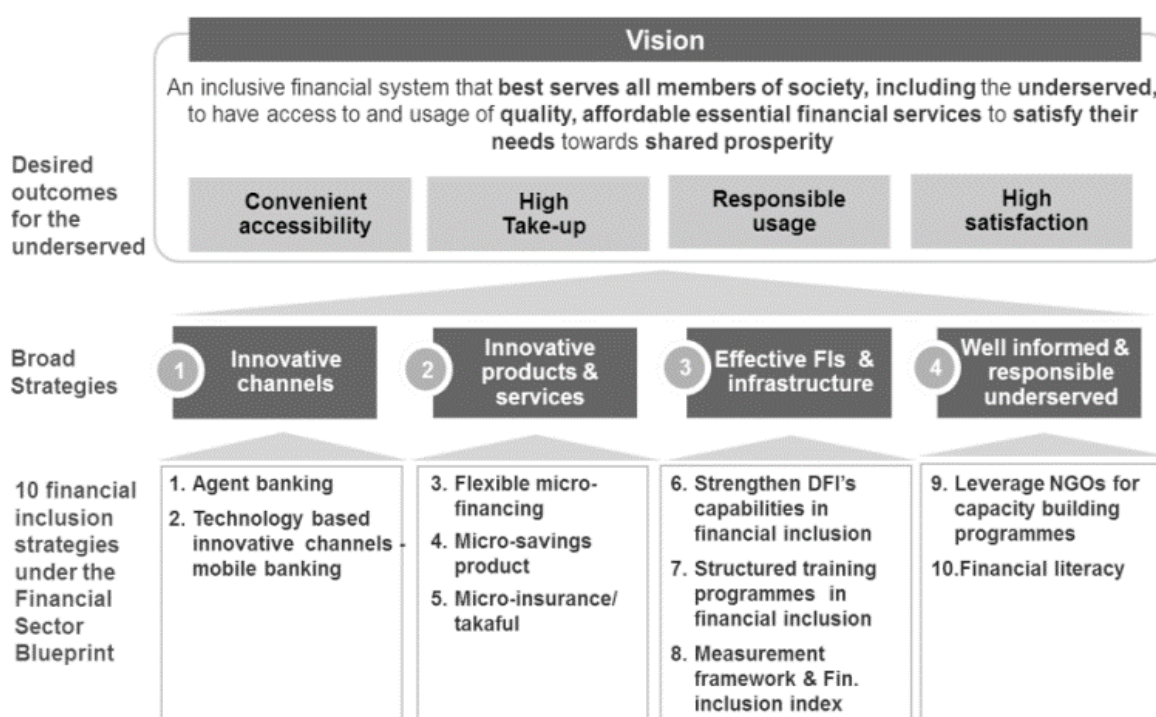
**Figure 2.3 Sources of SME Financing in Malaysia**

Note: The percentages can exceed 100% because enterprises may choose more than one answer.  
 Source: Economic Census 2016, Department of Statistics, Malaysia

Dusuki (2008) and Sow (2005) reveal that most Malaysian SMEs face difficulties in accessing financial support from commercial banks or other financial institutions because of their incapacity to provide collateral or reliable guarantors and business records to support their loan applications. Aris (2007) confirms that the lack of a financial track record, inadequate documents to support finance applications and the viability of the business impacts SMEs' access to finance. SMEs need to disclose

their managerial capabilities, financial status and repayment records to enable banks to assess their applications. Poor business performance and inadequate information are the main obstacles to SMEs obtaining finance from formal financial institutions such as commercial banks.

As SMEs contribute towards economic growth, providing them with access to finance from the formal financial system would be a catalyst to unlocking their potential to participate in business activities and would help them to contribute more to the economy. Therefore, access to finance has come to the attention of policymakers who want to build and strengthen institutions to support financial inclusion. For example, the government has tried to expand credit access through flexible microfinancing, and this has become one of 10 financial inclusion strategies under the Financial Sector Blueprint (2011-2020) (see Figure 2.4).



**Figure 2.4 A Framework under the Financial Sector Blueprint (2011-2020) to Enhance Financial Inclusion**

Source: Adapted from the World Bank (2017)

## **2.3 Overview of Microcredit**

Microcredit is a subset of microfinance that refers to small loans granted at a subsidised interest rate (de Aghion & Morduch, 2004) to low-income individuals who are excluded from the traditional banking system. The basic idea is that by delivering microfinance services to poor people, they will be able to take part in the economic market through forming small businesses (Al-Shami, Majid, Rashid, & Hamid, 2013). The microcredit system was introduced in the 1980s with the introduction of the Grameen Bank in Bangladesh. It was the springboard for the development of microcredit programs globally. The Grameen Bank is the classic example of a microcredit programme that provides credit to poor households to create new opportunities through self-employment, resulting in the people being able to take care of themselves and their families (Ahlin & Jiang, 2008; Ahmed, Siwar, & Idris, 2011; Chan & Abdul Ghani, 2011).

Professor Muhammad Yunus who is the founder of Grameen Bank in Bangladesh, gave collateral-free loans to villagers in Jobra (Mokhtar, 2011; Tuyon, Mohammad, & Ali, 2011) because he believed that lack of capital was the main hindrance to dynamic self-employment for the poor. An action research project has been launched in Bangladesh to examine the possibility of designing a credit programme targeting poor people in rural areas. De Aghion & Morduch (2004) and Giné and Karlan (2009) state that Yunus's fundamental insight was to show that financial resources can be made available to the poor if the right lending mechanism is used. Hence, he developed a credit programme based on group lending that required no collateral and no legal loan documentation. The motivation behind microfinance was poverty alleviation and, thus, credit is an effective weapon to combat poverty. The initiative of the Grameen Bank has been recognised as the most successful poverty eradication programme in the 1980s. Evidently, the founder of the Grameen Bank was awarded the Nobel Peace Prize for the success and achievements of the bank. Since then, the World Bank has acknowledged microfinance programmes as a mechanism to address income inequality and poverty (Ali, Abu-Hadi, & Ali, 2013).

### **2.3.1 Microcredit in Malaysia**

Microcredit in Malaysia was introduced as a part of poverty eradication programmes envisaged in the New Economic Policy (NEP) and the National Development Policy (NDP) implemented from 1971 to 1990. In the early independence days, ethnic groups in Malaysia were segregated in terms of geographical areas. Most Malays were located in the eastern and northern states of Peninsular Malaysia such as Perlis, Kedah, Kelantan and Terengganu. These states were considered less developed areas based on agriculture and fishing. In contrast, Chinese and Indians were located in

the western states of Peninsular Malaysia, such as Pulau Pinang, Perak, Negeri Sembilan and Selangor, which are more developed areas focused on modern sectors of the economy (Roslan, 2001). Table 2.9 shows that 88.8% of Malays lived in rural areas compared with Chinese and Indians, 44.7% and 30.6% respectively.

**Table 2.9 The Urban-Rural Population Split in Malaysia by Ethnicity in 1957**

<b>Ethnicity</b>	<b>Urban area (%)</b>	<b>Rural area (%)</b>
<b>Malay</b>	11.2	88.8
<b>Chinese</b>	44.7	55.3
<b>Indian</b>	30.6	69.4
<b>Other</b>	49.3	50.7
<b>Total</b>	26.5	73.5

Source: Mehden (1975) as cited in Roslan (2001)

As a result, an income gap and economic imbalance existed between ethnicities and the urban-rural populations (Omar, 1995). The NEP and NEM focused on overcoming the income inequality gap between the three major ethnic groups in Malaysia (Malay, Chinese and Indian) (Gibbons & Kasim, 1990). Subsequently, the incidence of poverty in Malaysia has dropped (Mokhtar, 2011). From 1987 to 2014, the incidence of poverty in Malaysia reduced substantially from 19.4% to 0.6% (see Table 2.10). In addition, the income distribution has also improved; since mid-1970, overall income inequality has declined, as well as inter-ethnic inequality.

**Table 2.10 The Poverty Incidence in Malaysia by Ethnicity and Strata, 1987-2014**

	<b>1987</b>	<b>1989</b>	<b>1992</b>	<b>1995</b>	<b>1997</b>	<b>1999</b>	<b>2002</b>	<b>2004</b>	<b>2007</b>	<b>2009</b>	<b>2012</b>	<b>2014</b>
Malaysia	19.4	16.5	12.4	8.7	6.1	8.5	6.0	5.7	3.6	3.8	1.7	0.6
<b>Ethnicity</b>												
Bumiputera	26.6	23.0	17.5	12.2	9.0	12.3	9.0	8.3	5.1	5.3	2.2	0.8
Chinese	7.0	5.4	3.2	2.1	1.1	1.2	1.0	0.6	0.6	0.6	0.3	0.1
Indians	9.6	7.6	4.4	2.6	1.3	3.4	2.7	2.9	2.5	2.5	1.8	0.6
Others	20.3	22.1	21.3	22.1	13.0	25.5	8.5	6.9	9.8	9.8	1.5	0.9
<b>Strata</b>												
Urban	8.5	7.1	4.7	3.6	2.1	3.3	2.3	2.5	2.0	1.7	1.0	0.3
Rural	24.8	21.1	21.2	14.9	10.9	14.8	13.5	11.9	7.1	8.4	3.4	1.6

Source: Economic Planning Unit Website (available at <http://www.epu.gov.my/en/household-income-poverty>)



The Malaysian government has taken initiatives to ensure that all Malaysians can live in comfort and have sufficient income to cope with life. The government provides finance through the microcredit system to deal with poverty. Inspired by the microcredit programme in Bangladesh, the microcredit programme in Malaysia started in 1986 with the establishment of Amanah Ikhtiar Malaysia (AIM) as a pilot project; it was launched in North-West Selangor to replicate and adopt the experience and success of the Grameen Bank. The goal of AIM is to reduce rural poverty through the provision of microfinance to the rural poor as a means of generating income. The rural poor are able to establish their own small businesses by the provision of finance thus improving their income. The concept applied by AIM is to give loans without collateral, a guarantor or legal action to obtain repayment. This approach used by AIM provides more opportunities and convenience to poor groups to access credit (Gibbons & Kasim, 1990). Hence it improves poor households' socio-economic conditions at the national level. The project was evaluated as successful (Gibbons & Kasim, 1990) and, until recently, has been the most dominant microfinance institution (MFI) in Malaysia. AIM provides three types of loan, namely, I-Wibawa, I-Mesra and I-Srikandi loans. Also, AIM provides an I-Penyayang loan (recovery loan), I-Bistari loan (education loan), and I-Sejahtera loan (a housing or multipurpose loan). Until now, AIM has been a successful project that helps the poor in rural areas to improve their standard of living, thus showing that poor households can get their family out of poverty through small loans (AIM, 2014). Furthermore, AIM provides many ranges of products and services and it reaches over 82% of the total poor and hardcore poor<sup>6</sup> households in urban and rural Malaysia (AIM, 2010).

As well as AIM, microfinance institutions in Malaysia include the National Entrepreneur Economic Fund (TEKUN). AIM focuses on reducing rural poverty, whereas TEKUN focuses on the development of Bumiputera<sup>7</sup> entrepreneurs. The objective of TEKUN is to provide easy financing facilities to Bumiputera for start-up and to further expand their businesses. TEKUN provides microcredit loans from a minimum of RM500 up to a maximum of RM50, 000.

In May 2003, the Malaysian government launched a microcredit scheme involving two banking institutions, namely Agro Bank and Bank Simpanan Nasional, to stimulate agricultural production activities as well as expanding SMEs' activities. The borrowers are eligible for a maximum loan of up to RM20,000 with an interest rate of 4% per annum and no collateral (Tuyon et al., 2011). Figure 2.5

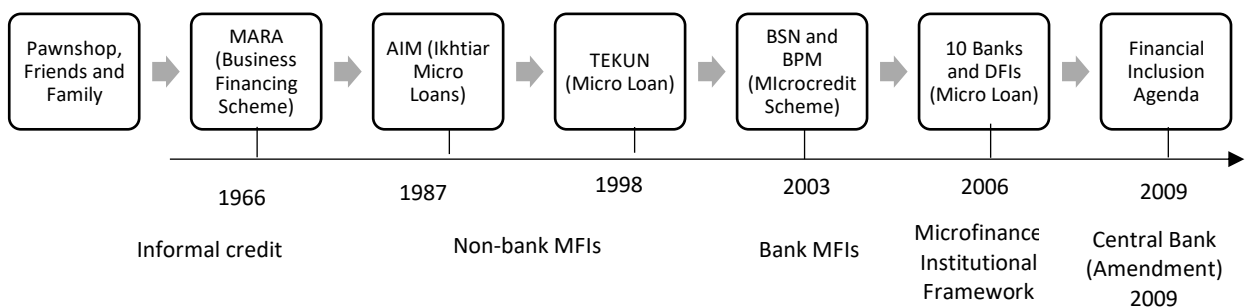
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<sup>6</sup> According to Economic Planning Unit Malaysia, the Poverty Line food and non-food items that have been established for poor households is RM830 per household and for hard core poor is RM520 per household.

<sup>7</sup> Bumiputera is an ethnic group in Malaysia who are native Malay who practise Malay customs as well as indigenous ethnic groups from Sabah and Sarawak who are protected by the country's constitution (Ismail, Bujang, Anthony Jiram, Abu Zarin, & Jaafar, 2015).

shows that the microfinance industry in Malaysia has continued to grow promoting greater access to financial services for all segments of society.

In August 2006, the central bank of Malaysia, Bank Negara Malaysia (BNM), introduced a Microfinance Institutional Framework. The involvement of the banking institutions in the microfinance industry is very important because they have the resources and branch networks with broader access. This framework comprises commercial banks, development finance institutions (DFIs) and credit unions to help develop a sustainable microcredit system. For instance, The National Savings Bank (BSN), a government-owned DFI, has been given the role of developing financial inclusion in Malaysia (World Bank, 2017) by providing finance to enterprises and individual businesses. BSN is an example of an institution that targets the excluded population through microcredit. In tandem with efforts to enhance convenience and outreach to low income and rural residents, BSN has been assigned to appoint 5,000 agents in rural areas nationwide to reach the customers. Meanwhile, Agro Bank provides finance to micro-enterprises engaged in agriculture and the agro-based sector.



**Figure 2.5 The Development of the Microfinance Industry in Malaysia**

Sources: Bank Negara Malaysia (2010), UNDP (2008) as cited in Tuyon et al. (2011, Figure 1,p.52)

Furthermore, the rural credit institutions comprise the Farmers Organisation Authority, Federal Land Development Authority and agro-based co-operative societies which also provide microcredit to the agricultural sector (Li & Rouyih, 2007). Credit Guarantee Corporation Malaysia Berhad was established to assist the micro-enterprises. They developed a scheme called Small Entrepreneur Guarantee Scheme which offers financing from RM10, 000 up to RM50, 000. The main microfinance programmes offered in Malaysia are summarised in Table 2.11. The full list of the ten participating banks is shown in Appendix A.6.



**Figure 2.6 The Malaysian National Microfinance Logo**

To create awareness of the availability of microfinance, a national logo of microfinance has been introduced (see Figure 2.6). The participating banks that offer a microcredit scheme display the logo at their branches. By displaying the logo, it is expected that more SMEs will benefit from microfinance to expand their businesses.

**Table 2.11 The Main Microfinance Programmes in Malaysia**

PROGRAMME	OBJECTIVES	LOAN CHARACTERISTICS
Amanah Ikhtiar Malaysia	Provide microfinancing to poor households to enable them to engage in economic activity and increase their income.	Credit RM 2,000 to RM 20,000. Repayment period between 25 weeks and 6 months. Service charges 10% per annum.
TEKUN	Provide a microfinance facility to assist small Bumiputera entrepreneurs in their start-up or to expand the business. The purpose is to develop capital requirements.	For the first loan: Loan between RM1, 000 and RM10, 000; For second loan and above: up to RM20, 000. Repayment between 26 weeks and 156 weeks. Service charge 8% per annum.
Agro Bank	Provide finance to small enterprises engaged in the agricultural sector.	Loan between RM1, 000 and RM20, 000. Repayment 3 months to 5 years. Finance rate 4% per annum.
Bank Rakyat	Improve access to capital finance thus allowing further development of the firm and competition in the global market.	Loan between RM1, 000- RM50, 000. Repayment 1 month to 5 years. Finance rate 15% per annum on monthly balance.
BSN	Provide loans to individual or small enterprises as additional capital to expand or start a business.	Loan between RM5, 000- RM50, 000. Repayment between 1 and 5 years (monthly basis). Finance rate 4% per annum depending on monthly balance. Guarantor required.

Source: SME Annual Report, 2011

### **2.3.2 Role of Microfinance in the Development of SMEs**

Economic growth through enterprise development raises the earnings of poor households and decreases the inequality of income distribution (Wolfe, Page, & Mahat, 2008). Microfinance is generally considered a cushion for SMEs' development through income and capital generation. Microfinance can also be described as banking for the underprivileged. Microfinance is nowadays seen as an integral part of an inclusive financial system. Consequently, financial inclusion has become an essential policy goal that complements the traditional pillars of financial and monetary stability (Hannig & Jansen, 2010). Microfinance provides financial aid to the poor to participate in income generating activities that enable them to accumulate capital and concurrently improve their standard of living (Littlefield, Morduch, & Hashemi, 2003). Microfinance around the world shows that small amounts of credit to SMEs may help them grow (Khandker, 2005; Mead & Liedholm, 1998; Woller & Parsons, 2002). A microfinance programme enables SMEs to enlarge current economic activity and breakthrough in their income (Haim, Abidin, Noor, & Majid, 2007).

According to the Consultative Group to Assist the Poor (2003), microcredit serves as a credit mechanism that practises effective collateral substitutes to provide working capital loans to SMEs. A surge in the growth of microfinance has been noticed; it plays an important role in developing countries, including among ASEAN members. For example, in Indonesia, microfinance is an effective tool to assist low-income people take advantage of economic opportunities, improve their standard of living and reduce poverty (Tambunan, 2014). According to an Asian Development Bank (2007) report, the microcredit programme in the Philippines had a significant impact on the number of micro-enterprises and the number of workers employed, reflecting that the programme was designed to cater for the entrepreneurial poor.

Microcredit is also the provision of small-sized financial services to the poor or low-income households whose activities are mainly micro, small and medium enterprises. Therefore, many countries, such as India, Indonesia, Sweden, Denmark and Malaysia, began to develop microcredit systems to help poor people to get out of poverty and improve their welfare. The aim of microfinance programmes is to facilitate poor people, especially low-income people, small businesses, small farmers, micro-entrepreneurs, pensioners and female heads of households, to access credit, in which most of the credit offered is collateral free (Abdul Wahab, Mamun, Mazumder, & Zhan, 2014).

One objective of the microcredit programme is to provide loan facilities to poor women to engage in business activities that generate income. In addition, microcredit can help rural women increase their

total income and help their families escape poverty (Ahmed et al., 2011). As a result, using the loans provided by microfinance institutions, rural women successfully engage in various productive business activities to earn money. Women borrowers' household consumption increased after obtaining microcredit (Pitt & Khandker, 1998). Similarly, Malhotra, Schuler, and Boender (2002) revealed that women become more sensible about their family's welfare after joining a group-based microcredit programme, which ultimately leads to positive outcomes for their children's education and health, as well as their household's wellbeing.

Hartarska and Nadolnyak (2008) indicated that the presence of microfinance institutions was to alleviate financing constraints by SMEs. Microcredit serves as a source of finance to SMEs, enabling them to transform their ideas into production. In addition, microcredit helps SMEs in terms of finance for their set up and expanding their operations, developing new products, and employing new staff or production facilities. The credit facilities were used not only for farming activities but also for craft, artisan and service enterprises. Thus, the development and sustainability of microfinance is important in order to achieve greater financial inclusion and ensure that all economic sectors, regions and societies have access to a full range of financial products and services (Khandker, Khalil, & Khan, 1995). The financial inclusion of the poor will lead to higher incomes.

The Malaysian government provides a comprehensive set of financial assistance products directly and indirectly through several ministries, institutions and agencies to facilitate and assist SMEs in getting the required finance. These allocations cover the financing needs of SMEs throughout the three stages of their life cycle, i.e., start-up, expansion and rehabilitation (Abdullah & Ab Manan, 2010). Principally, microcredit programmes have been developed to provide SMEs with greater credit accessibility and the size of a microcredit loan is between RM1, 000 and RM50, 000 with no collateral (Bank Negara Malaysia, 2010). The loan has a term of one month to 10 years and the purpose of the loan is for start-up or to expand an existing business.

## **2.4 Chapter Summary**

This chapter reviews the definition of SMEs in selected countries and compares the definition of SMEs among ASEAN members including Malaysia. The most common criterion used by countries is the number of employees and several countries set lower and upper limits based on the size of the enterprise. The role and contribution of SMEs were widely recognised as the backbone of economic growth in Malaysia in the aftermath of the financial crisis in 1997. Since then, SMEs' development has received increased interest from policymakers and has been placed high on the government agenda. Malaysia is amongst the few economies in the Asian region where credit is widely available

to support SMEs. However, in 2014, the Economic Census Profile of SMEs revealed access to credit remained a major challenge to SMEs and thus consequently hampered their growth and development.

This chapter also reviews microcredit in general and in Malaysia, in particular. The microcredit system was introduced in the 1980s by Professor Muhammad Yunus from Bangladesh, who gave collateral-free loans to villagers (Mokhtar, 2011; Tuyon et al., 2011). Microcredit has evolved and spread from its origin in Bangladesh to other developing countries, including Malaysia. Since then, various projects have been initiated to help poor people who are excluded from traditional banking. The Malaysian government decided to replicate the Grameen bank model by forming Amanah Ikhtiar Malaysia (AIM). The microfinance industry in Malaysia continues to grow to reach and promote greater access to credit, especially for small businesses.

# Chapter 3

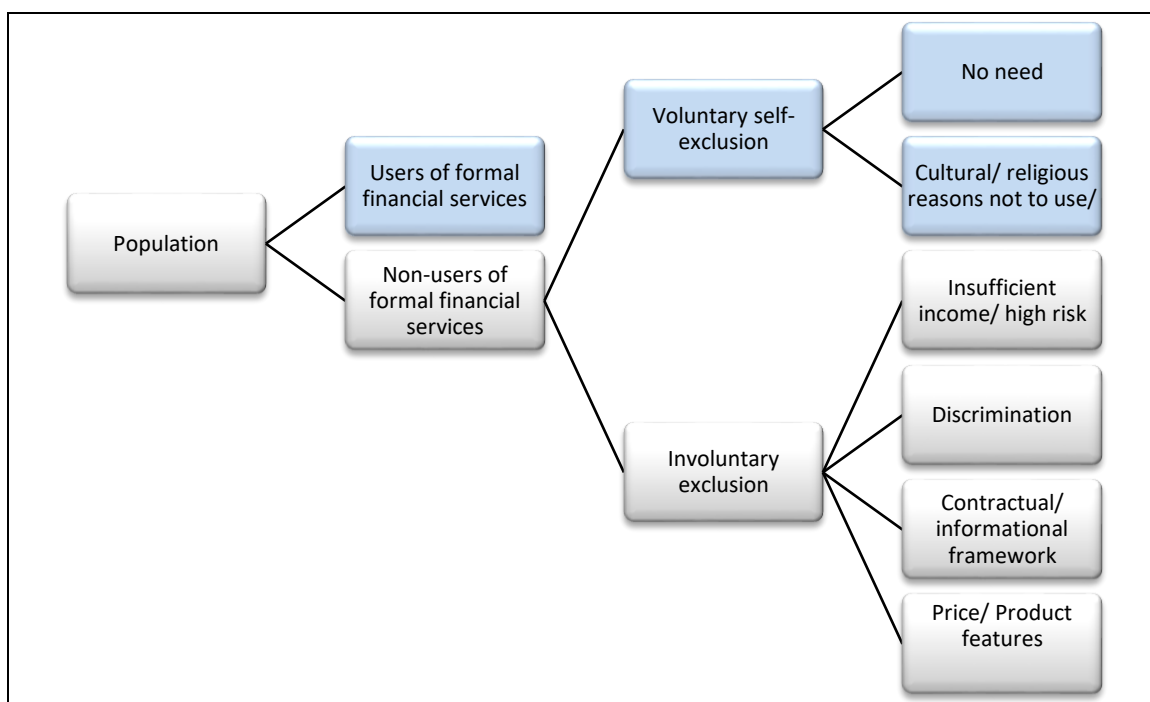
## Literature Review

This chapter addresses two areas of microcredit literature; it consists of six sections. Section 3.1 is a review of literature on accessibility to credit. Section 3.2 reviews the determinants of credit accessibility including the empirical models for credit accessibility. Section 3.3 discusses the factors influencing microcredit providers. Section 3.4 identifies the factors affecting loan rates that are charged on microcredit. Section 3.5 reviews the impact of microcredit programmes, including impact evaluation methodologies and impact evaluation of microcredit on enterprises' performance. Section 3.6 summarises the chapter.

### 3.1 Credit and SMEs

Advocates suggest that financial exclusion acts as a “brake” on economic development as it impedes economic growth and increases poverty and inequality (Beck & Demirgüç-Kunt, 2008; Mole & Namusonge, 2016; Wagner & Winkler, 2013). Lack of broad access to financial services implies the existence of price and non-price obstacles in the use of financial services (World Bank, 2008). Figure 3.1 illustrates access to finance. SMEs can be divided into two categories: users and non-users of financial services. SMEs that use financial services can be guaranteed access to finance. However, non-users of financial services do not have access to finance because SMEs confront a choice whether they are voluntarily or involuntarily excluded from financial services. For example, there are those who do not use financial services because of cultural or religious reasons or because they do not require any finance. Hence, these non-users of financial services have access to finance, but they choose not to use the financial services that are available. For involuntarily excluded SMEs, they demand financial services, but they do not have access to financial services and comprise several different groups (see Figure 3.1). First, there is a set of households and businesses that are considered ‘unbankable’ by commercial financial institutions and markets due to the fact that they do not have enough earning or sufficient income; or they present a greater lending risk. Second, there might be discrimination towards certain population groups based on religious, social or ethnic grounds. For instance, Khalid and Abd Wahab (2014) report that the lack of Islamic finance discourages some SMEs from borrowing from conventional banks because they believe that loans with an interest rate are forbidden in Islamic law. Third, the contractual and information framework might prevent financial institutions from reaching out to certain population groups because the outreach is too costly to be commercially viable. For SMEs that are in areas of low population

density, physical access to banking services can be very difficult (World Bank, 2008). Finally, the price of financial services may be too high, or the product features might be inappropriate for some population groups. For example, credit access may increase by having collateral. Generally, financial institutions require collateral when approving credit, whereas poor people often have inadequate marketable collateral such as physical assets, hence they are often excluded from traditional financial markets.



**Figure 3.1 Distinguishing Between Access to Finance and The Use of it By Individuals and Groups**  
Source: Adapted from World Bank (2008)

Credit is viewed as essential for any business to grow. At an enterprise level, credit is required to finance working capital and investment in fixed capital. Unfortunately, it is widely recognized in the literature that SMEs struggle with access to finance (Beck & Demirguc-Kunt, 2006; Irwin & Scott, 2010; Lawless & McCann, 2011). SMEs without credit languish and stagnate. Carpenter and Petersen (2002) observed that the growth of over 1,600 SMEs in the U.S. appeared to be constrained by a lack of internal equity financing. Enterprises without access to bank funding increase their vulnerability to external shocks (Atieno, 2009). The availability of credit raises the possible growth of surviving firms during periods of macroeconomic instability and the capability of SMEs to grow depends highly on their potential to invest in restructuring, innovation and qualifications. Nevertheless, all these investments need capital and access to credit is essential for SMEs to develop and sustain their businesses. Access to finance improves firm performance as reported in the Investment Climate Survey of the World Bank. It not only enables market entry, growth of firms and risk reduction (Beck



& Demirgüç-Kunt, 2008) but also promotes innovation and entrepreneurial activity (Klapper, Laeven, & Rajan, 2006). Enterprises with greater access to capital are able to exploit more investment opportunities (Beck, Demirgüç-Kunt, & Maksimovic, 2005). In other words, the aggregate performance of the economy will be improved by improving access to capital (World Bank, 2008).

The theory of credit markets pioneered by Stiglitz and Weiss (1981) attempts to explain credit rationing in credit markets. The theory explains why some borrowers can obtain loans from markets but others cannot. Agency problems such as asymmetric information and moral hazard can impact on the availability of credit. As discussed by Stiglitz and Weiss (1981), market imperfection creates credit rationing and limits credit access for SMEs. According to Bataa (2008), Chong (2010) and Malhotra et al. (2006), the main reasons SMEs are usually more credit constrained are:

- (i) The transaction cost is relatively high because it is inefficient to process small loans to SMEs.
- (ii) The difficulty for both financial suppliers and SMEs in adopting new lending technologies such as: 1) undertaking loans that focus on the prospective borrowers' ability to pay with less focus on collateral; and 2) introducing apposite decision-making and control instruments supported by management information systems and information technology to assist manage the loan portfolio.
- (iii) Information asymmetries because of the high cost of gaining information on SMEs and inconsistent financial statements, as well as lack of references in the marketplace.
- (iv) The high risk of operations because SMEs are very vulnerable and have volatile turnover.
- (v) SMEs have weaker firm management compared with well-established firms.

According to Schmidt and Kropp (1987), access to financial services by small enterprises is known as one of the constraints that limit their benefits from credit facilities. However, in most cases, the access problem, especially among financial institutions, is one created by institutions mainly through their lending policies. This is exhibited in the form of prescribed minimum loan amounts, complicated loan application procedures and restrictions on credit for specific purposes. Potential borrowers do not apply for credit if credit duration, terms and conditions of repayment, require security such as collateral, and the provision of additional services do not fit their needs and requirements. Therefore, potential borrowers do not apply for credit because they would be denied access even when credit exists. Okurut (2006) adds that lenders require collateral as a screening mechanism to minimise the

default risk. Many SMEs tend to be denied access to credit because of complicated loan procedures and documentation in lending processes (Harvie et al., 2013; International Finance Corporation, 2011) especially for poor people. Okurut (2006) adds that poor people face credit rationing from the credit market since the banks incur high costs of information in assessing the creditworthiness of small borrowers and receive low returns because of the small amount borrowed by small borrowers. Therefore, lenders require collateral as a screening mechanism to lessen default risks.

Furthermore, the characteristics of entrepreneurs or enterprises can affect accessibility to credit (Umoh, 2006). Bigsten, Collier and Dercon (2003) include the characteristics of the owner-manager of SMEs, firm age, firm size, legal status and ownership structure in determining access to credit and this will be discussed in the next section.

## **3.2 Determinants of Access to Credit**

### **3.2.1 Factors Affecting Access to Credit**

Akudugu, Egyir and Mensah-Bonsu (2009) describe access to credit as a condition in which an individual has the right, makes an attempt to possess, and makes decisions to borrow or not to borrow. The decision depends on the borrower's economic endowment and opportunities (Messah & Wangai, 2011).

Several factors determine credit accessibility.

#### ***Owner/Manager Characteristics***

According to Hessels and Terjesen (2008), entrepreneurial human capital refers to an entrepreneur's knowledge, experiences and skills related to a business activity. Some studies construct human capital theory by looking at the background of the owner, such as education, age, gender and experience, when assessing creditworthiness (Biggs, Raturi, & Srivastava, 2002; Storey, 2004; Umoh, 2006). Evidence in the literature indicates the success of small businesses depends on the ability of the owner/manager (Mahmood & Mohd Rosli, 2013) to control the business. Therefore, the characteristics of the owner/manager are essential determinants of credit accessibility because they can influence access to credit and affect the SMEs' performance. In addition, understanding the owner/manager characteristics may lead to a better understanding of the financial practices of SMEs.

Previous research highlighted age (Ibrahim & Aliero, 2012; Ogubazghi & Muturi, 2014), gender (Watson, Newby, & Mahuka, 2009; Wellalage & Locke, 2017) and marital status (Hoque, Sultana, & Thalil, 2016) as the indicators that are frequently used to understand SMEs' credit accessibility. These

indicators were used to find out whether any demographic characteristic was associated with credit accessibility and its impact on SMEs' performance. However, evidence in the literature shows mixed findings. According to Vos et al. (2007), young owners use external finance more strenuously than older owners who are less likely to use external finance. Conversely, Akoten et al. (2006) found young managers tend to borrow from friends and relatives because they lack social capital and because of fewer interactions with economic agents. Ogubazghi and Muturi (2014) found that the age of the owner/manager has a significant effect on access to bank loans and concluded that firms managed by young owners face difficulties accessing debt finance.

In terms of gender, Hussain, Scott, Harrison and Millman (2010) showed a study on gender differences and access to finance in China. The authors asserted that women businesspersons have equal access with men businesspersons when it comes to obtaining business finance. In contrast, in many developing countries, women entrepreneurs reported greater barriers to accessing formal financial services (Klapper & Parker, 2011). Recently, Wellalage and Locke (2017) discovered that SMEs owned by female were less likely to be credit constrained than their male counterparts. In contrast, Scott and Irwin (2009) found that women businesspersons have better access to banks. However, this finding is not significant and it is concluded that gender has no influence on SMEs' access to bank finance. Similarly, Buvinić and Berger (1990) found that women applying for loans generally do not face higher denial rates than men; they suggest that gender differences in credit usage might be explained by differences in the demand for external finance.

Marital status may also influence access to credit. It is argued that married owners have a higher probability of borrowing both from banks and informal sources, such as rotating savings and credit associations (Akoten et al., 2006). Sebopetji and Belete (2009) conducted a study on access to credit in South Africa and found married people have a significantly positive influence on access to credit because the lenders may view married persons as more likely to have a stable income and financial position. Conversely, Atta (2012) asserted that marriage does not matter in access to credit; the important factor is the borrower's well-being characteristics such as consumption flow, wealth stock, equality, and economic security.

Age, gender and marital status have increasingly been considered in studies of credit access but one characteristic is relatively unexplored, ethnicity. The ethnicity of the owner-manager appears to be an important influence in determining access to credit. Previously, established literature highlighted that ethnicity either enabled or constrained access to finance (Akoten et al., 2006; Biggs et al., 2002; Bruder, Neuberger, & Rathke-Doppner, 2011; Scott & Irwin, 2009). A recent study by Bruder et al.

(2011) discovered that foreign citizen entrepreneurs living in Germany with an immigration background, or who were born outside Germany, significantly experience barriers in the denial of credit and they obtain smaller loans than native entrepreneurs who do not have an immigration background. Akoten et al. (2006) found that the majority of ethnic groups conveniently seek finance compared with minority ethnic groups. Evidence focusing on ethnicity and finance in Malaysian SMEs is scarce and limited in the literature. Mat Nawi (2015) found that the use of external finance by Malaysian SMEs is influenced by ethnicity.

Numerous studies have highlighted that the educational attainment of the owner/manager increases the number of decisions to apply for external financing. For example, Khalid and Abd Wahab (2014) examined 530 SMEs in Libya using logistic regression and found that owners/managers with lower education tend to borrow from banks to start their business. There are opposing results. According to Irwin and Scott (2010), owners/managers with lower education levels often obtain funding from family and friends and home mortgages and those with a higher education levels have fewer difficulties in gaining funding for their business. Rand (2007) explained that owners/managers in Vietnam with better education levels refrain from applying for loans because they know their application will be rejected. It is stimulating to note that micro and small enterprises are more profitable when the owners/managers have many years of education (Akoten et al., 2006). With regard to SMEs in Malaysia, Mohamed, Kamilah and Jonathan (2006) found that the education level is statistically significantly negatively associated with the manager's preference for external finance. Nofsinger and Wang (2011) studied the key factors of external financing in 27 countries and concluded that owners'/managers' experience is helpful in accessing financing from institutional investors. However, Ogubazghi and Muturi (2014) revealed that the owner/manager's level of education does not make much difference in determining SMEs' access to bank loans.

Mosley and Hulme (1998) found strong evidence of a positive relationship between access to credit and the borrower's income level. The authors indicated that the upper and middle levels of poor people receive more benefit from income-generating credit initiatives than the poorest. Similarly, Umoh (2006) found an increase in the income of entrepreneurs decreased the likelihood of firms demanding credit.

### ***SMEs' Characteristics***

Evidence from the literature suggests that, besides owner characteristics, business characteristics may also influence firms' access to credit. Several characteristics of SMEs influence their financial

behaviour and decisions to access finance, for example, age, size, sector and ownership. Therefore, SMEs' characteristics also are important factors affecting access to credit.

Many studies report that a firm's age influences the firm's access to credit. Most newly-established and young businesses face great hitches in obtaining external finance because of information asymmetries (Gertler, 1988; Kira & He, 2012; Martínez-solano & Hernández-cánovas, 2010). Gertler (1988) stressed that information asymmetries occur because the creditors do not have sufficient time to monitor young firms and build long-term relationships with the suppliers of finance. Byiers, Rand, Tarp and Bentzen (2010) agreed that well-established firms are easy to monitor and have more favourable credit access. However, previous research also showed that young firms that have a well-established track record can access external finance. In fact, without having a good reputation, banks and other financial institutions are disinclined to give credit (Abdulsaleh & Worthington, 2013). Thus, newly established firms seek finance from informal sources more than well-established firms that have advantages in seeking bank debt or equity (Nguyen & Luu, 2013).

Abdulsaleh and Worthington (2013) and Fatoki and Asah (2011) observed that SMEs established for over five years have a better opportunity to succeed with credit applications than SMEs established less than five years. Abdullah and Manan (2011) found that in Malaysia the impact of a firm's age on access to credit is not significant because it reflects a reliance on profit and the deficit nature of short-term debt financing. Osei-Assibey, Bokpin and Twerefou (2012) pointed out that a new microenterprise is considered risk averse because the microenterprise prefers less risky and less costly financing, such as bootstraps. Bootstrap financing is defined as a variety of alternatives that an entrepreneur can take to meet the business's financial needs without borrowing from financial institutions, such as trade credit and leasing (Van Auken & Neeley, 1996). As the enterprise becomes established or matures, its capacity to seek formal financing increases. Woldie, Mwita, & Saidimu (2012) studied three different business cycles: 1) start-up, 2) two years after start-up, and 3) five years after commencement of the business. The author found that infant enterprises (start-up) were financed from savings (37.1%), family and friends (28.6%), inheritance (20.0%) but only 2% from minimal formal financial sources. The author concluded that very few young enterprises have the experience and skills to obtain loans.

Beck and Levine (2004) suggested that small firms usually turned to informal sources, such as moneylenders or family and friends, or relied on short-term bank loans, to finance a larger share of investment. Meanwhile, large firms used formal external sources, such as equity and bank finance to facilitate their investment. According to Allen, Chakrabarti, De, Qian and Qian (2012), Beck,

Demirgüç-Kunt and Maksimovic (2008) and Nguyen and Luu (2013), large firms are more likely to have fewer constraints when accessing credit because they have many other funding sources. However, small-sized firms have a higher credit risk that limits their access to bank credit. Beck et al.'s (2008) study showed that small firms depend more on informal and internal finance than bank finance. Similarly, Hainz and Nabokin (2013) showed that the probability of demanding external finance by small firms is 6% lower than for bigger firms. This indicates that small firms prefer internal sources or have fewer credit demands compared to big firms.

In addition, prior studies also encompassed sectors as dummy variables to examine whether there is a difference in accessibility to credit for different sectors in the economy. For instance, Kira and He (2012) indicated that in Tanzania firms in the industry sector can acquire debt finance much more easily than other sectors. In contrast, Mulaga's (2013) study indicated that in Malawi the manufacturing sector is more likely to use external finance than the industry and services sector. This is supported by Tanaka and Molnar (2008) who said that manufacturing firms have easier access to financing in China compared with firms not engaged in manufacturing activities. In contrast, Beck et al. (2008) found no difference in debt financing across sectors. Le (2012) found that in Vietnam SMEs in the service sector, followed by some manufacturing industries, have a higher probability of success in obtaining bank loans.

Finally, the literature reveals different financing behaviour across firm ownership. Ownership structure in firms can impact the ability to obtain access to bank finance. For example, a sole proprietorship is considered a high risk borrower because the loan repayment depends on one person whereas a partnership has the repayment risk spread among several owners (Gamage, 2013). Government-owned firms suffer fewer financing difficulties than privately-owned firms. Government-owned firms can access formal debt more easily because they receive direct assistance from the government and favourable treatment from government-owned financial institutions (Harrison, Love, & McMillan, 2004; Laeven, 2003). Nguyen and Luu (2013) found no significant relationship between credit, type of ownership of firms and credit constraints.

### ***Networking***

The relationship between creditors and enterprises has become particularly relevant in accessing credit (Harhoff & Körting, 1998). Networking is significant to the entrepreneurial progression because the information required to start and expand a business is passed to the entrepreneur principally through the existing social networks of existing partners or friends. The issue of information asymmetry in the creditor/debtor relationship can be reduced by networking (Shane & Cable, 2002).

When there is a non-existence of effective market institutions, networking and relationships can be a substitute and they are also effective ways for firms to access external credit. Moro and Fink (2013) agree that the trust of a loan manager toward firms may reduce credit barriers and enhance accessibility to credit. In fact, several authors have come to an agreement that networks are an effective way for the firms to overcome information asymmetry (Dabla-Norris & Era Koeda, 2008; Fraser, Bhaunik, & Wright, 2013; Safavian & Wimpey, 2007; Shane & Cable, 2002).

Small and large firms can benefit from strong relationships with financial institutions because they can use information acquired over the course of the relationship from deposits, loans and other services to set contract terms or make credit underwriting decisions. Although there are different types of institutions available in credit markets, they may have different abilities to sustain strong relationships with small firms (Berger, Goulding, & Rice, 2014). Most previous research showed strong relationships between lenders and borrowers benefited the borrowers via low interest rates and relatively easy loan approval. In addition, better credit availability is a result of strong relationships; this is measured by a higher loan application approval rate, less reliance on expensive trade credit, or fewer collateral requirements (Berger et al., 2014; Cole, 1998; Elsas & Krahn, 1998; Harhoff & Körting, 1998; Machauer & Weber, 2000; Moro & Fink, 2013; Petersen & Rajan, 1994, 1995). Berger and Udell (1995) found that in the United States when a relationship is stronger, interest rates on loans for small businesses are lower. Several studies have found no significant effect in the European market of the relationship between the lenders and borrowers and interest rates (Berger et al., 2014; Degryse & Van Cayseele, 2000; Elsas & Krahn, 1998; Harhoff & Körting, 1998; Machauer & Weber, 2000).

Networks and relationships are considered more important for firms that want to obtain informal finance and venture capital. This gives advantages to informal creditors who do not depend on official information disclosed by firms, such as financial statements or business plans, compared with formal creditors (Dabla-Norris & Era Koeda, 2008; Safavian & Wimpey, 2007). Other studies suggest that it is easy for a firm to access credit based on the relationship between the creditor and a firm, since the network is the main determinant that helps firms to be less financially constrained (Bougheas, Mizen, & Yalcin, 2006; Nguyen & Luu, 2013). From another perspective, credit is available when entrepreneurs build a network with a business association. Membership of a business association may facilitate networking and information sharing (Gemechu & Reilly, 2011). The authors demonstrate that a firm that is a member of a business association is 18 percent more likely to have access to credit than firms that are not members of such organisations. This is because membership of such associations enables sharing information among firms.

### 3.2.2 Factors Affecting Access to Microcredit

As a response to the failure of the formal financial sector to cater for the credit needs of poor people and small businesses, such as microenterprises, microcredit was introduced in the late 1970s by Professor Muhammad Yunus to help these people. Microcredit was designed to help poor people move from financial exclusion to financial inclusion. Because of its potential, such as reducing poverty, microcredit has been recognized as an efficient development intervention programme by many countries (Li, Gan, & Hu, 2011a). A growing number of SMEs worldwide need access to microcredit; however, accessibility is still low, especially in developing countries (Hussain, Millman, & Matlay, 2006). Woldie, Mwita, & Saidimu's (2012) study of Tanzanian SMEs finds the biggest challenge that hinders the growth of firms is limited access to microfinance services and products.

Previous research has investigated the key aspects in accessing microcredit. For example, Li, Gan and Hu (2011a) studied at household level the determinants that influenced the accessibility of microcredit in rural Chinese areas. The authors found that poor rural women have restricted access to the microcredit provided by Rural Credit Cooperatives. Also, the authors found that household factors, including income, assets, education level, location and household size, have different effects in determining accessibility to microcredit. For example, household income is a contributor to households' access to microcredit because of the higher demand for credit resulting from the higher capital needed by the household, hence it increases the probability of accessing microcredit. Takahashi, Higashikata and Tsukada (2010) show that the characteristics of adult women were key factors for participation in microcredit programmes in Indonesia, but other village and household characteristics did not significantly affect the decision to participate. More notably, farmland and areas of residential lots, which can be a proxy for the capability to put up collateral, have no impact on participation. The collateral-free scheme did not influence participation, but relatively richer families gained access to microcredit more than the poor.

Table 3.1 summarises the determinants of access to microcredit. Previous studies have focused on obtaining microcredit at the household-level, but relatively few studies have examined the effect at the enterprise level. The objective of microcredit is to create self-employment for the 'unbankable', poor people setting up in business. Therefore, SMEs' characteristics, such as the age of the firm, size of the enterprise and the economic sector, should not be neglected. It is important to see whether business characteristics have a significant influence on access to microcredit. Umoh (2006) investigated the factors influencing access by small firms to microcredit in Nigeria. The author found that the type of enterprise has a significant effect on access to microcredit, but firm size was not significant. A recent study by Peprah and Ayayi (2016) pointed out that older age SMEs are more



likely to benefit from microcredit than younger businesses. The business age can be used as a proxy to determine the sustainability of the business in the past. Further, younger businesses seem unable to make good use of debt compared with mature enterprises. An investigation of this gap in the literature is essential to provide a better understanding of the credit market, particularly microcredit in Malaysia.

Many researchers describe networking as an essential factor in accessing bank loans because SMEs seek to access resources for development (Fraser et al., 2013; Moro & Fink, 2013; Shane & Cable, 2002). However, we are not aware of any study that specifically looks at networking as a key factor of access to microcredit. Therefore, networking is an interesting instrument to monitor among the factors influencing access to microcredit by SMEs in Malaysia. Limited access to microcredit perhaps reflects networking with loan-providing officials and business associations.

Increasing distance between small businesses and credit providers can be a key barrier to credit access (Petersen & Rajan, 2002; Presbitero & Rabellotti, 2014). Some studies document that distance is always associated with high transaction costs so it tends to decrease access to credit (Garikipati, 2012; Ibrahim & Bauer, 2013). Conversely, Dao, Mai and Kim (2014) found distance between enterprise and credit providers over 20 km can reduce the probability of facing credit constraints by 0.92%. This might happen when SMEs desire to access banks with stable credit relationships and familiar procedures despite the distance. The authors concluded that a short distance between the business and the bank is not necessarily a favourable condition for credit access.

**Table 3.1 Explanatory variables identified in previous studies affecting access to microcredit**

Author	Explanatory variables used in previous studies affecting access to microcredit																	
	Owner Characteristics (1)							Household Characteristics (2)			Business Characteristics (3)				Networking (4)		Distance (5)	Other Variables Used
	A	G	MS	E	FT	EXP	EDU	HS	HI	IE	AB	SB	O	S	LP	BA	D	
Umoh (2006)	-	-	-	-	-	-	X	X	X	-	X	X	X	-	-	-	-	Level of sales, value of initial capital
Takahashi et al., (2010)	X	X	X	-	-	-	X	X	-	X	-	-	-	-	-	-	-	Area of residential property
Li, Gan, & Hu (2011a)	X	X	-	-	-	-	-	X	X	-	-	-	-	-	-	-	X	Household assets, farm size, self-employment, village or township officials, location, attitude, alternative sources
Durojaiye, Yusuf, & Balogun (2014)	X	X	X	-	-	-	X	X	-	-	-	-	-	-	-	-	X	Interest on loan, payback period, social capital variables
Peprah & Ayayi (2016)	-	-	X	-	-	-	X	X	-	-	X	-	-	X	-	-	X	Number of years spent in school, reading ability, years in business

<sup>8</sup>Note: Column 1: Age (A), Gender (G), Marital status (MS), Ethnicity (E), Education (EDU), Financial Training (FT), Experience (EXP)

Column 2: Household size (HS), Household Income (HI), Income earner (IE)

Column 3: Age of business (AB), Size of business (SB), Ownership (O), Sector (S)

Column 4: Loan provider (LP), Business Association (BA)

Column 5: Distance (D)

<sup>8</sup> All variables listed are used in this study to determine the key factors in accessing microcredit by SMEs in Malaysia

### 3.2.3 Credit Access and Modelling Techniques

Many empirical studies attempt to test the explanatory power of credit accessibility. Numerous studies have determined the issues affecting access to credit for SMEs (Ajagbe, 2012; Akoten et al., 2006; Harvie, Oum, & Narjoko, 2010). Ajagbe (2012) assumes an enterprise has two alternatives: either to take credit or not to take credit. These authors used probit analysis to identify the factors that affect a small-scale enterprise's decision to take credit in Nigeria. In a similar study, Akoten et al. (2006) investigated the determinants of credit access for Kenyan producers from four different types of financing sources (family and friends, rotating savings and credit associations, MFIs, and banks). The authors used a multivariate probit approach. The determinants of credit access include the characteristics of the owner/manager and location dummies. A study by Essien and Arene, (2012) employed the logit model to identify the determinants of access to credit for small-scale agribusinesses in the Niger Delta. Le (2012) used a binominal logit model to assess the key determinants of firms and financial characteristics, credit worthiness, industry and region dummies on firms' access to credit in Vietnam.

Danso-abbeam, Ansah and Ehiakpor (2014) used the probit model to analyse determinants that influence the probability of access to credit but the Tobit model was used to analyse the determinants of the amount of credit disbursed to micro-small-medium scale enterprises (MSME) in Ghana. Empirical results from the probit regression model indicate that educational level, provision of a personal guarantor, duration of the business, permanent place of business, and household size significantly influence the probability of an MSME's access to credit from the microfinance institutions. Similarly, Umoh (2006) employed the probit model to investigate the connection between a micro-entrepreneur's access to credit and a vector of household and enterprise characteristics, including age, educational level, family size, age of enterprise, type of enterprise and firm size. Abdullah and Ab. Manan (2011) investigated Malaysian SMEs' financing and found age and assets of SMEs are insignificantly correlated to accessibility to finance. However, a weakness of the study is the use of the descriptive statistical method with a minimum quantitative analysis (cross tabulation). The present study utilizes an econometric technique that allows a quantitative measure of the effects of the explanatory variables on the dependent variable. This is important given the desire of stakeholders to have first-hand information on the specific factors that influence access to microcredit among Malaysian SMEs. The difference between the probit and the logistic models is that probit models assume the probability of credit access to be normally distributed, but logit models assume such probability to be logistically distributed (Li, 2010); nevertheless, the empirical

results of both models tend to be comparable. Thus, logistic models are employed in the present study because of their simplicity (Train, 2003).

### 3.3 Factors Affecting the Choice of Microcredit Provider

Another issue emerging from the literature review is that, given that microcredit credit providers are available in the credit market, what factors drive the SMEs' choices in choosing microcredit providers in Malaysia? As discussed in Chapter 2, besides microfinance institutions, BNM has designed 10 participating financial institutions to help SMEs access microcredit. Consequently, microcredit is one financing option for Malaysian SMEs to fund their growth (Muridan & Ibrahim, 2016) and this has become a common source for 'unbankable' people. However, according to Mokhtar and Ashhari (2015), microcredit providers in Malaysia face challenges in reaching and attracting the poor, including SMEs. Therefore, it is important to find the key determinants influencing the choice of microcredit providers among SMEs in Malaysia. This study differs from other previous studies because the focus is on SME's choice of microcredit provider, namely microfinance institutions, commercial banks and development financial institutions (see Figure 3.2). Knowledge of the SMEs' choice regarding the various microcredit providers is important because it helps us understand their borrowing behaviour, thus providing a better framework within which to execute successful strategies to enhance the sustainable development of the microfinance industry.

Microfinance institutions	Commercial banks	Development financial institutions
<ul style="list-style-type: none"> <li>•AIM</li> <li>•TEKUN</li> <li>•YUM</li> <li>•MARA</li> </ul>	<ul style="list-style-type: none"> <li>•Alliance Bank</li> <li>•AmBank</li> <li>•CIMB Bank</li> <li>•Maybank</li> <li>•Public Bank</li> <li>•United Overseas Bank</li> </ul>	<ul style="list-style-type: none"> <li>•Agro Bank</li> <li>•Bank Rakyat</li> <li>•BSN</li> </ul>

**Figure 3.2 The Microcredit Providers in Malaysia**

Source: Tuyon et al. (2011) and BNM website (available at [http://www.bnm.gov.my/documents/sme/en\\_Comparative\\_Table\\_20160511.pdf](http://www.bnm.gov.my/documents/sme/en_Comparative_Table_20160511.pdf))

The decision to choose between different microcredit providers is impacted by a number of factors such as owner characteristics, loan characteristics, networking, and distance that influence a borrower's decision to choose among the different types of microcredit provider. Recognising the diverse financial needs of SMEs, microcredit providers have adopted different business models and

strategies (Tuyon et al., 2011) to reach SMEs. Hence, loan characteristics are also implied in determining the choice of microcredit provider available in Malaysia. According to the SME Corporation Malaysia report in 2011, as SMEs' businesses grow and mature, they tend to choose credit provided by commercial banks and DFIs because the financial assistance provided by MFIs is limited. For example, the loan amount that can be borrowed from MFIs is relatively small and may no longer meet business needs (Hassan, Abdul Rahman, Abu Bakar, Mohd, & Muhammad, 2013). As SMEs grow and expand, they require large amounts of credit to finance investments and purchase working capital goods (Presbitero & Rabellotti, 2014).

With regard to the interaction between the microcredit providers and the borrowers, potential borrowers who have maintained a long membership with their microcredit provider are more likely to borrow from them. The financial institutions provide micro credit products through their existing branch network (Tuyon et al., 2011) in which financial institutions provide other financial products such as savings accounts. Therefore, those who have savings accounts with financial institutions that offer microcredit are more likely to borrow from commercial banks or DFIs than MFIs (some MFIs in Malaysia are not allowed to accept deposits) (Li & Rouyih, 2007).

### **3.4 Factors Affecting the Loan Rate Charged on Microcredit**

Since microcredit was introduced in late 1970s, the interest rate charged on microcredit has captured the attention of policy makers around the world. Microcredit organisations tend to charge the highest interest rates to borrowers. Previous studies analysed the determinants of interest rates in the standard banking literature (Fernando, 2006; Rosenberg, Gaul, Ford, & Tomilova, 2013; Rosenberg, Gonzalez, & Narain, 2009) but interest rates in microfinance are less studied (Dorfleitner, Leidl, Priberny, & von Mosch, 2013). Even though the microfinance market is very competitive, the interest rate charged is still high. The research question is what factors determine the microcredit loan rate? To the best of our knowledge, this question has not been previously studied. Like other loans, microcredit must be repaid. For this reason, microcredit providers must assess the risks of SMEs (Serrano-Cinca, Gutiérrez-Nieto, & Reyes, 2016). Therefore, this study attempts to increase our understanding of the loan rate charged by microcredit providers.

According to Kapkiyai and Kimitei (2015) the interest rate charged depends on the riskiness of the borrower to mitigate the problem of adverse selection where an option is made between risky and non-risky borrowers. Interest rates might discriminate between male and female borrowers.

Dorfleitner et al. (2013) used a worldwide data set of 712 microfinance institutions to investigate

factors such as cost factors, gender, regulation, lending methodology and organizational type that influence microcredit interest rates. The authors found that women pay high microcredit interest rates. Similarly, an empirical study by Alesina, Lotti and Mistrulli (2008) showed women in Italy pay a relatively higher interest rate than men even though women are less risky than men. Hermes, Lensink and Meesters (2011) observed that women are less efficient than men therefore microcredit providers tend to charge higher interest rates to women borrowers. Additionally, the loan rate is also determined by the age of the borrower. Lenders consider younger borrowers are more risky and so pay a higher interest rate (Alesina et al., 2008).

Previous studies have investigated the bank-borrower relationship that determines the interest rate charge on loans (Rand, 2007; Titman & Wessels, 1988). According to Rand (2007), firms can borrow at lower interest rates when they have a previous borrowing relationship with a bank. Similarly, Titman and Wessels (1988) argued that small firms with lesser relationships with financial institutions are regarded as less preferred clients and the bank charges high interest rates. This is supported by Thakor's (1996) study results that interest charges and transaction costs will decrease when the relationship between banks and small firms is closer. This is because the interest rate is based on a risk and return profile and because banks can get more information on a borrower with a close relationship which mitigates the risk of non-payment and causes a transaction cost decline.

Every microcredit provider has different features and adopts different business models (Tuyon et al., 2011). Dorfleitner et al. (2013) hypothesize that the interest rate charged depends on different types of microcredit provider. The authors used dummy variables to represent the types of microcredit provider: non-governmental organizations; nonbank financial institutions; banks; rural banks and credit unions. They found non-bank financial institutions charged higher interest rates than other types of institutions. The results are consistent with the findings of Cuéllar-Fernández, Fuertes-Callén, Serrano-Cinca and Gutiérrez-Nieto (2016) who identified that non-bank financial institutions charged the highest interest rate and credit unions charged the lowest interest rate. The possible explanation for this effect might be the democratic ownership of credit unions by their clients.

For SME characteristics, Titman and Wessels (1988) argued that older firms might be less risky and therefore less prone to financial distress and can generate debt at lower interest rate. The effect of the sector variable on interest rate is less explored. With the concept of the greater the risk, the greater the interest rate charged by the lender, the agricultural sector is perceived as high risk because of exposure to natural hazards such as storms, floods and drought and so pay a high interest rate.

### 3.5 Impact of Microcredit

Microcredit schemes have become progressively significant components of strategies to promote SME development (Hulme, 2000). The role of microcredit is to provide credit to the poor so improving access to microfinance is an effective way to reach the poor and improve their lives. According to Hartarska and Nadolnyak (2008), the presence of microfinance institutions minimizes financing constraints and helps small firms access credit and hence improve their businesses. Numerous studies have questioned the impact of microfinance and many studies debate that the impact of microfinance diverges between positive impact, no impact and negative impact (Ganle, Afriyie, & Segbefia, 2015; Rooyen, Stewart, & Wet, 2012; Tolieng, Prasirtsak, Sitdhipol, Thongchul, & Tanasupawat, 2017).

Several researchers agree that small amounts of credit to small firms could help business growth (Khandker, 2005; Mead & Liedholm, 1998; Woller & Parsons, 2002). Banerjee, Duflo, Glennerster and Kinnan (2009) argue that microfinance programmes have a significant impact on business outcomes, such as profits, sales and the number of people employed by the business. Likewise, Ngehnevu and Nembo (2010) found that in Cameroon microfinance programmes yield a significant contribution to business performance by businesses receiving financial aid and social intermediation services. A positive impact is also supported by Durrani, Usman, Malik, & Ahmad (2011) who revealed that access to and efficient provision of microcredit can facilitate the poor to smooth their consumption, cope with managing their risks, steadily build their assets, establish their enterprises, enhance their income earning capacity and improve their quality of life by reducing their poverty. The authors add that, in terms of businesses, the entrepreneurs are able to expand their businesses and adopt better technology consequently stimulating productivity through microfinance (Islam, 2007).

The United Nations Conference on Trade and Development (UNCTAD, 2001) reported that access to microfinance is one of the most important determinants of the sustainability and growth of SMEs worldwide. To confirm this assertion, Suberu, Aremu and Popoola's (2011) study shows that a few small firms were able to access credit, but for the small firms that have access to microfinance they benefit from the institution's microfinance loans. In addition, most small firms feel that institution microfinance loans contribute to promoting their market excellence and overall economic competitive advantage.

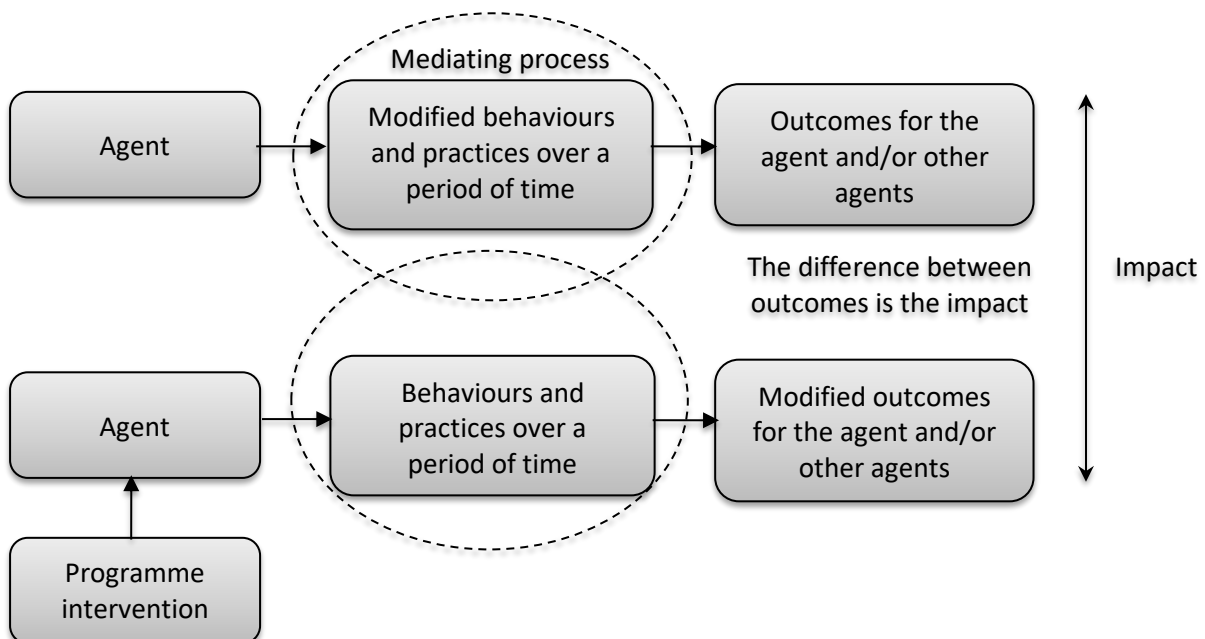
Ogunrinola and Alege (2007) investigated the impact of microfinance on small firms in Lagos State, Nigeria. The study shows a significant difference between entrepreneurs who accessed institutional microfinance and those who did not; hence, they conclude that microfinance institutions are very important in the financial industry because of their positive impact on individuals, businesses, other financial institutions, the government and the overall economy. Mamun, Malarvizhi, Wahab and Mazumder (2011) conducted a study on AIM's microfinance programme and showed that microfinance can increase the microenterprise income of its clients in Peninsular Malaysia. Mosley and Hulme (1998) assumed that microfinance programme intervention can change human behaviours and practices leading to better achievement. Based on retrospective data on microfinance instructions gathered from Guatemala, India, and Ghana, the impact of microfinance was shown to be positive on the borrowers' households as well as their businesses (McIntosh, Villaran, & Wydick, 2008).

Despite its positive impact, other researchers have pointed out the negative impact that microfinance can have. Mokhtar and Ashhari (2015) claim microcredit loans cannot be used as a measure of business success in Malaysia. The authors argue that entrepreneurs should receive entrepreneurial and technical skills before microcredit is disbursed. In fact, borrowers must be equipped with the relevant abilities and skills that can minimize the negative impacts (Ahmad & Seet, 2009). Likewise, Atmadja, Su and Sharma (2016) investigated the impact of microfinance on microenterprises in Indonesia and found a negative relationship between microcredit and business profits. The authors suggest that, as the business develops, the volume of microcredit should be reduced and replaced by the owners' savings and retained profits. With regard to the impact of microcredit on employment, Bauchet and Morduch (2013) rejected the idea that SMEs efficiently create jobs for the population.



### 3.5.1 Impact Evaluation Methodologies

The assumption behind microfinance programmes is that intervention will change human behaviours and practices in ways that lead to the achievement of the desired outcomes. Hulme (1997, p.3) depicted a conventional framework of an impact chain (see Figure 3.2) by defining the “impact assessment” (IA) as “to assess the difference in the value of key variables between the outcomes of ‘agents’ (individuals, enterprises, households, populations, policymakers) which have experienced an intervention against the values of those variables that would have occurred had there been no intervention”. Based on this framework, the process of IA includes three elements: 1) assessing the model; 2) choosing ‘agents’ (assessment units), and 3) choosing ‘outcomes’ (assessment indicators).



**Figure 3.3 The Impact Evaluation Framework**

Source: Adapted from Hulme (2000)

For example, an enterprise or SME is chosen as an agent. The binary choice of microcredit participation is denoted as  $D$ . If  $D = 1$ , the enterprise participates in the programme, while  $D = 0$  if the enterprise does not participate. The observed value of the outcome is denoted as  $Y$ . This variable can take two values that depend on the participation programme, i.e.,  $Y_1$  which means the outcome of the participant and  $Y_0$  denotes the outcome of the non-participant. The outcome is reflected over a time period after the programme is implemented. Therefore, the impact of the microcredit programme on the outcome of the enterprise is:

$$\Delta_i = Y_{i1} - Y_{i0} \quad (3.1)$$

### 3.5.2 Issues in Impact Evaluation

The difficulty in addressing 'attribution', that is, isolating the effect of the programme from other factors, has become the obstacle to assessing the impact of microcredit (Khandker, Koolwal, & Samad, 2010), or determining the 'counterfactual', which means what would have happened to the participants if the microcredit programme did not exist (Baker, 2000; Hulme, 2000). However, Islam (2007) argues that the changes or impacts after a project's intervention (like microcredit) may have been affected by other factors irrelevant to the particular project being evaluated, which makes the attribution of an observed change or impact to the project under evaluation difficult.

According to Khalily (2004), the impact of microfinance programmes is limited when it comes to effectiveness if the following problems exist: (1) selection bias; and (2) endogeneity issues. There are several potential sources of bias when studying the impact of microcredit. Selection bias naturally occurs because participants and non-participants are the selected groups with different outcomes, even in the absence of the programme. Selection bias might occur from observable factors, such as age or experience differences (Phan, 2012). For example, the owner/manager of an SME who borrows may have observable characteristics, such as high education or experience, that make them more likely to have higher levels of impact even without access to credit. Additionally, selection bias in programme evaluation occurs when unobservable factors, such as motivation or ability, also play a role in influencing the decision of participation. For example, highly motivated individuals are more likely to participate and are more likely to have higher outcomes (Baker, 2000). Hulme (2000) identified that selection bias arises because of: (i) difficulties in locational selection; (ii) differences in 'invisible' attributes between the treatment group and control group; (iii) receiving any form of intervention, which is the Hawthorne effect of intervention on the treatment group; (iv) contamination of control groups by treatment groups; and (v) fungibility of treatment.

Furthermore, endogeneity can occur as a result of measurement error, simultaneity or reverse causality, and omitted variables. When estimating a firm's performance individually, in the presence of the endogeneity effect, the result would lead to biased and inconsistent estimates because of the expected correlation between the error term and the endogenous variable (Gamage, 2013).

Therefore, endogeneity has always been present and is recognized as a problem that undermines causal inference (Gippel, Smith, & Zhu, 2015). Therefore, endogeneity and selection bias have to be taken into account appropriately for reliable estimates of impact. Baker (2000) asserts that bias can be controlled through statistical techniques as discussed in the next section but it is very challenging to fully remove them thus they remain a major challenge in impact analysis.

### 3.5.3 Impact Evaluation Methods

Different methods have been developed to overcome inadequate information when collecting information and to minimise bias in evaluating impact. Impact evaluation methods include sample survey, rapid appraisal participation, participation observation, case studies, and participatory learning and action (Hulme, 2000). The strengths and weaknesses of each method have been addressed by Montgomery et al. (1996) (see Table 3.2 for a description of the strengths and weakness of each method).

Determining the counterfactual is the core of evaluation design. This can be accomplished using several approaches that fall into two broad groups, i.e., experimental designs or randomized, and quasi-experimental designs or known as non-randomized (Baker, 2000). Table 3.3 presents programme impact evaluation methods. First, randomised design is claimed to provide a precise counterfactual and control for self-selection bias provided that the experiment is properly implemented and individuals are randomly allocated to either treatment or control groups (Blundell & Dias, 2000). Moreover, the analysis of such experimental data is rather simple because it commonly analyses the differences in mean values by treatment status. However, several drawbacks exist in the case of randomised experiments, e.g., double-blinding, ethical issues, pseudo-random methods, attrition and the fact that behavioural changes caused by the experiment itself, such as Hawthorne<sup>9</sup> effects, cannot be ruled out. Besides, properly designing an experiment is not always feasible because such randomised experiments are often expensive to implement (Blundell & Dias, 2000).

Alternatively, impact evaluation of programmes resorts to non-experimental designs to establish comparable control groups, which are as identical as possible, on the basis of observable factors, to treatment groups through a matching method (Caliendo & Kopeinig, 2008). Next, the differences in the outcome variables for participants and their matched non participants are calculated, i.e., the average treatment effect on the treated (ATT), which is the mean difference between participants and matched non-participants (Heckman, Ichimura, & Todd, 1997). The treatment effect can only be estimated in the region supported by using various types of matching methods including propensity score matching, radius, nearest neighbour and caliper matching (see Caliendo & Kopeinig, 2008;

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<sup>9</sup> The Hawthorne effect refers to behavioural changes in the treatment group. For example, individuals in the treatment group might positively change their behaviour during the duration of the study as a response to being observed (Duvendack, Palmer-jones, Hooper, Loke, & Rao, 2011).

Leuven & Sianesi, 2003). However, this approach does not take into account the observable characteristics.

Instrumental variables are first used to predict programme participation; one then sees how the outcome indicator varies with the predicted values. This identifies the exogenous variation in outcomes attributable to the programme, recognizing that its placement is not random but purposive. To employ the instrument variable, the variable(s) that serves as the instrument(s) to separate programme participation from the outcome measures must be identified and included in the data collection. According to Khandker (2005), the stiffest part in employing instrumental variables is to find reliable instruments and the need to select them carefully because weak instruments can possibly worsen the bias even more than when estimated by ordinary least squares if those instruments are correlated with unobserved characteristics or omitted variables affecting the outcome.

Another popular impact evaluation method is the 'difference-in-difference' (DID) method also known as the double-difference method. DID requires panel data before and after the programme implementation in which one compares a treatment and comparison group (first difference) before and after a programme (second difference) (Baker, 2000). The advantage of this method is that it allows for the selection bias of the programme based on some unobservable factors. Of course, this experiment has its own limitations. First, there is the requirement for panel data before and after the programme. Second is the time invariant assumption of the unobservable variables that affect the programme selection that are unchanged over time and the programme state. This assumption might be violated in non-experimental data in which individuals in both groups are systematically different and not well-balanced in the pre-programme attributes, which are possibly related to the outcome (Ashenfelter & Card, 1985). Some studies combine this approach with use of the matching method (Lyngdoh & Pati, 2013; Takahashi et al., 2010).

Another method to resolve endogeneity is endogenous switching regression (ESR) model. The ESR model estimates the impact of a binary endogenous treatment variable on a continuous outcome variable. A switching equation sorts individuals over two different states (with one regime observed). The method involves using a two-stage method to derive consistent starting values. The first step suggested by (Maddala (1983, pp 223) consists of estimating the selected equation based on a discrete choice model (Kimhi, 1999). The second step involves estimating the coefficient for the effect with two regime equations for observed and unobserved regimes.

**Table 3.2 Common Impact Evaluation Methods**

<b>Method</b>	<b>Key features</b>	<b>Strength or Weakness</b>
<b>Sample survey</b>	Collect quantifiable data through questionnaires. A random sample and a matched control group are used to measure predetermined indicators before and after intervention.	High scale of applicability and representation High quantification and data standardisation High ability to isolate and measure non-project causes of change High cost and time scale High human resource requirements High ability to capture diversity of perceptions and negative impacts
<b>Rapid appraisal participation</b>	A range of tools and techniques developed originally as rapid rural appraisal. It involves the use of focus groups, semi-structured interviews with key informants, case studies, participant observation and secondary sources.	Low scale of applicability and representation Low quantification and data standardisation Low ability to measure project causes of change High ability to capture qualitative information and causal processes High skilled resource requirements
<b>Participation observation</b>	Extended residence in a programme community by field researchers using qualitative techniques and mini- scale sample surveys.	Low scale of applicability and representative Low quantification and data standardisation High ability to capture diversity of perceptions and negative impact High time scale and medium cost range
<b>Case studies</b>	Detailed studies of a specific unit (group, locality, organisation) involving open-ended questions and the preparation of histories.	Low scale of applicability and representation, and quantification High ability to capture diversity of perceptions and negative impact
<b>Participatory learning and action</b>	The preparation by the indented beneficiaries of a programme of time lines, impact flow charts, village and resource maps, well-being and wealth ranking, seasonal diagrams, problem ranking and institutional assessments through group processes assisted by a facilitator.	Low scale of applicability and representation, and quantification Low ability to measure project causes of change High ability to capture diversity of perceptions and negative impact

Source: Adapted from Hulme (2000) and Montgomery et al. (1996)

**Table 3.3 Summary of Programme Impact Evaluation Methods Using Survey Data**

<b>Method</b>	<b>Key features</b>	<b>Strengths/Weaknesses</b>
<b>Randomised design</b>	Experimental type of data Programme impact can be calculated directly from the control and treated groups	Randomisation can solve the missing data problem Randomisation still suffers from attribution problems
<b>Matching</b>	Non-experimental type of data Programme impact can be recovered from the coefficients under common support region	Various matching techniques developed can be used to obtain the impact coefficient Matching requires relatively rich data to construct the common support region
<b>Instrumental variable</b>	Non-experimental type of data Programme impact can be estimated under selection of unobserved factors that affect participation decision	Instrumental variable can solve bias of participating decision based on unobserved factors due to non-experimental sampling design
<b>Difference-in-Differences</b>	Non-experimental and panel type data Programme impact can be calculated from the control and treated groups under a time invariant assumption and no compositional changes within each group	Difference-in-difference method can solve problems related to selection bias and attribution Difference-in-difference method requires two periods of data and relies on two underlying assumptions
<b>Endogenous switching regression<sup>a</sup></b>	Switching equation sorts individuals over two different states (with one regime observed). It is solved by using a two-stage method to derive consistent starting values.	Able to capture both direct and indirect effects, but it is not capable of measuring the magnitude of the direct effect.

Source: Adapted from Baker (2000); (a) (Kimhi, 1999; Lokshin & Sajaia, 2004)

### 3.5.4 Previous Studies on Impact Evaluation Problems

Different econometric methods have been applied to deal with selection bias in empirical studies. Nguyen (2007) measured the impacts of borrowing activities on borrowers' consumption for the period 1992-1998 in Vietnamese rural households. Different econometrics techniques were used in Nguyen's study. First, the author ran a simple ordinary least square (OLS) regression of household consumption on household independent control variables such as age of head of household, gender of head, education level of head, employment, house value and land holding size. The author found that the results could be biased because controls for endogenous variables were not included and, therefore, implemented the propensity score matching method following probit regression.

To deal with the sample selection bias in impact evaluation on cross sectional data, Shahriar (2012) applied a propensity score matching (PSM) technique to measure the impact of microfinance in Northern Bangladesh. This technique assumes that the probability of participation in a microfinance programme can be determined by observable characteristics. Two individuals with similar propensity scores, one from the treatment group and the other from the control group are matched. The mean outcome difference of such paired individuals can be attributed to programme participation because the matched individuals have similar characteristics. Similarly, Oh, Lee, Heshmat, and Choi's (2009) controlled for selection bias with Kernel PSM techniques to evaluate the impact of credit guarantee policy in the Korean manufacturing sector. Additionally, to improve the robustness of the estimation, the authors also conducted the same analysis with nearest neighbour matching with replacement and radius matching. PSM is a useful tool to control for bias because of observed factors in impact evaluation on cross sectional data and is generally considered the best alternative to non-experimental design (Baker, 2000).

Some studies recommend the panel data model if data are available to mitigate biases because of unobserved factors. Li, Gan and Hu (2011a) used the panel data model that contains at least two periods of observation on a similar set of characteristics. Khandker (2005) studied the impact of microfinance on poverty reduction in Bangladesh using the panel data method to estimate the time-varying borrowing effects on the household welfare and estimated the fixed-effect method to eliminate programme placement bias.

The study on the evaluation of the impact of microfinance on women's empowerment in the matrilineal tribal society in north east India conducted by Lyngdoh and Pati (2013) used a combination of PSM and DID techniques in the analysis. PSM ensures a matched sample by balancing the experimental group and control group on covariates. The study sampled 300 women

microfinance clients [the experimental group<sup>10</sup> (EG)] and 150 women non-microfinance clients [the control group<sup>11</sup> (CG)] that were chosen through stratified random sampling from different districts. Their study highlights that microfinance positively impacts income, expenditure and savings. Even though a study may suffer from such bias problems, Baker (2000) argues that selection bias cannot fully be removed, leaving it as a major challenge for impact assessment.

Another problem associated with the analysis of impact evaluation on access to microcredit is endogeneity. Endogeneity has always been recognized as a problem that undermines causal inference (Gippel et al., 2015). However, failure to address or simply note in passing that the problem exists could seriously lead to biased results. Khalily and Khaleque (2013) used instrumental variables to address the endogeneity issue when estimating the impact of access to credit and productivity of enterprise in Bangladesh. Correspondingly, Clarke, Cull, and Martínez Pería, (2006) dealt with potential endogeneity using an instrumental variables approach when investigating whether higher foreign bank participation improves the accessibility of external financing for firms. The authors used a dummy variable indicating whether the observed country placed limits or restrictions on the degree of foreign ownership in the banking sector as an instrument for the level of foreign bank participation.

### **3.5.5 Impact of Microcredit at the Enterprise Level**

Microcredit is critical for the growth of SMEs because SMEs require sustained investment of working capital. But, at low income levels, the accumulation of such capital may be challenging. Under such circumstances, microcredit may enable SMEs to improve their income and accumulate capital (Atieno, 2001). This section reviews the impact of microcredit at the enterprise level using different techniques. Empirical studies on the impact of microcredit can be classified into two groups: those that neglected the selection bias problem and those that did not.

Table 3.4 shows some studies on the impact of microcredit did not take into account the issue of selection bias (Atmadja et al., 2016; Dunn & Arbuckle, 2001; Hartarska & Nadolnyak, 2008; Ouma & Rambo, 2013). For instance, Dunn and Arbuckle (2001) used analysis of covariance (ANCOVA) to evaluate the impact of microcredit on participants of microcredit in Peru and found it substantially increases microenterprise net income, assets and employment. Even though the study was based on panel data to measure the impact variables between 1997 and 1999, methodological limitations to address possible selection bias may provide unreliable results. Hartarska and Nadolnyak (2008) used

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<sup>10</sup> Refers to a group of women who participate in microfinance

<sup>11</sup> Refers to a group of women who do not participate in microfinance



the credit constraints approach to study the impact of microfinance on access to credit for microenterprises in Bosnia and Herzegovina. Their results indicate that microfinance can alleviate financing constraints faced by businesses. The logit model used in the study evades methodological challenges typical of impact assessment and thus leads to underestimation or overestimation of its results.

**Table 3.4 Summary of Previous Studies on Impacts of Microcredit at the Enterprise Level**

<b>Author(s)</b>	<b>Area/country</b>	<b>Unit of analysis</b>	<b>Outcome indicator</b>	<b>Approach</b>
Dunn & Arbuckle (2001)	Peru	Enterprise	Net income Assets Employment	ANCOVA
Hartarska & Nadolnyak, (2008)	Bosnia and Herzegovina	Enterprise	Income	Logit model
Ouma & Rambo (2013)	Kenya	Enterprise	Sales volume Net profits Number of paid workers	Frequency distributions, percentages and cross-tabulations
Johansson & Pettersson (2014)	El-Salvador	Enterprise	Sales Total assets Equity	OLS regression
Ferdousi, (2015)	Bangladesh	Enterprise	Business Income	Simple regression
Atmadja et al., (2016)	Indonesia	Enterprise	Profit (increased, decreased, or unchanged)	Ordered probit
Tedeschi, (2008)	Peru	Enterprise	Profits	Fixed effects Instrumental variable
Peprah & Ayayi (2016)	Ghana	Enterprise	Sales Stock Expenses Profit	Propensity score matching
Quaye & Hartarska, (2016)	Ghana	Enterprise	Amounts of investment	Propensity score matching

Numerous studies have endeavoured to correct for selection bias and have found positive impacts of microcredit using various econometric techniques (see Table 3.4). For instance, Tedeschi (2008) attempted to solve selection bias using fixed effects and instrumental variables and emerged with the evidence to support the positive effect of microfinance on business profits. Similarly, Peprah and Ayayi (2016) found a positive impact of microcredit on clients' sales, profits, and expenses compared

with their non-microcredit counterparts. The authors addressed the issue of selection bias by using propensity score matching and nearest neighbour matching. The PSM approach has the advantage of solving the selection bias problem that may be posed by self-selection of clients. The main pillars of this impact model are individuals, treatment and potential outcomes. Quaye and Hartarska (2016) also employed PSM to investigate the effect of microcredit access on the amount of investment made by the small enterprises in Ghana and concluded that unconstrained enterprises make higher investments than constrained enterprises because unconstrained enterprises acquire funds from microcredit providers.

With regard to the impact of microcredit on small business in Malaysia, Mahmood and Mohd Rosli (2013) used regression analysis to investigate 756 micro and small enterprises and found a microcredit scheme significantly impacts a firm's performance across AIM and TEKUN. The authors concluded that a microcredit scheme helps to bridge the capital gap and enhances the performance of SMEs in Malaysia. Hassan and Ibrahim (2015) studied the impact of microcredit on 350 enterprises in Penang, Malaysia. They found 175 respondents (50%) felt that the microcredit programme was very helpful; 152 respondents (43.43%) felt that the programme increased their business income. Only two respondents (0.57%) said that the programme was not helpful, four (1.14%) said the programme had no impact, and three (0.86%) were unsure whether the programme was helpful. The authors conclude that microcredit programmes have a positive impact on a firm's business. Similarly, (Abdul Wahab et al., 2014) employed an average effect of treatment to study the impact of microcredit on women empowerment in urban Peninsular Malaysia. The authors' results show microcredit is a powerful tool in promoting women's empowerment in various aspects including their role in household economic decision making, economic security, control over resources and family decisions, mobility and legal awareness in urban Malaysia.

**Table 3.5 Impact Microcredit in Malaysian Studies**

Author	Topic	Sample	Institutions	Analytical techniques
Ahmed et al. (2011)	Impact of a microcredit programme for the rural poor: Evidence from Amanah Ikhtiar Malaysia	Members of AIM and TEKUN	AIM	Descriptive
Mamun, Malarvizhi, Hossain, & Wahab (2011)	Examining the effect of participation in microcredit programmes on assets owned by hard core poor households in Malaysia	Members of AIM	AIM	Structural equation modelling
Chan & Abdul Ghani (2011)	The impact of microloans in vulnerable remote areas: evidence from Malaysia	Beneficiaries of AIM	AIM	Structured survey interview

However, the study on the impact of microcredit in Malaysia is inconclusive because most of the studies focus only on AIM (see Table 3.5). Besides, the AIM and TEKUN microcredit schemes are also offered by the Central Bank of Malaysia and channelled through 10 financial institutions including commercial banks and development financial institutions. The present study grasps the essential need to investigate the impact of microcredit scheme not only for AIM and TEKUN but also other microcredit providers. Additionally, the impact of microcredit on Malaysian SME performance has been less explored using econometric techniques thus leaving room for further investigation. The details of the impact methodologies will be discussed in Chapter 4.

### 3.6 Chapter Summary

This chapter reviewed the relevant theories and practices regarding credit markets, accessibility and the impact of microcredit. SMEs are constrained in access to formal credit because financial institutions fail to grant credit because of information asymmetry, high processing cost and insufficient valuable collateral. Therefore, microcredit was introduced to cater for the credit needs of poor people and small businesses. Understanding the key factors to access microcredit among SMEs is important because SMEs contribute greatly to income and employment creation.

Previous empirical studies have focused on household-level factors in microcredit accessibility, but relatively few studies are of enterprise-level factors. In addition, to the best of our knowledge, the

present study is the first attempt at an impact evaluation study of microcredit on SMEs' performance based on a quasi-experimental using the PSM and DID methods to mitigate selection bias.

This chapter also reviews impact evaluation methodologies and the problem of impact evaluation. In Malaysia, although few empirical studies have documented a positive impact of microcredit programmes, the findings are inconclusive because the studies neglect econometric issues in impact evaluation, i.e., selection bias and endogeneity. Therefore, it is necessary to evaluate the impact of credit on SMEs' performance measured by sales and employment growth.

## **Chapter 4**

### **Research Methodology and Data**

This chapter explains the methods and empirical models used in the study. Section 4.1 begins with a discussion of the conceptual framework and empirical models on accessibility to microcredit by Malaysian SMEs. Section 4.2 describes the model in determining the factors in choosing a microcredit provider. Section 4.3 specifies the empirical model to identify the factors that influence the interest rate charged on the microloan. Section 4.4 provides the model to assess the impact of microcredit on SMEs' performance. Subsequently, Section 4.5 discusses the data collection including the survey questionnaire and sampling technique, followed by conclusion of the chapter.

#### **4.1 Accessibility to Microcredit of SMEs**

##### **4.1.1 Conceptual Framework**

The terminology of “access to credit” is repeatedly used in this study. Therefore, it is important to have a precise and clear definition of the term. Access to credit can be defined as an individual's capacity to borrow from a particular credit source though, for a variety of reasons, the individual may choose not to do so (Diagne & Zeller, 2001). When an individual has a demand for credit and applies for it, the lender determines the success of the application according to the eligibility of the individual. Credit is vital for the SMEs to expand business operations, create new products and employ new workers or production facilities. Many small businesses start with one or two people using their own funds and may obtain additional financial assistance from friends and family for their businesses (OECD, 2015). The government of Malaysia has designed micro financial institutions to help SMEs in their operation and fill a financial gap. As the microcredit programme has been significantly expanded since its official establishment in 2006, SMEs are often presumed to have better access to microcredit. According to Khalily and Khaleque (2013) larger enterprises have more access to bank credit whilst SMEs have more access to microcredit. According to the Department of Statistics Malaysia (2011), over half of SMEs used internal funds and only 21.9% of SMEs relied on banks, microfinance and development financial institutions. An increasing number of SMEs need accessibility to microcredit; however, accessibility is still low, especially in developing countries (Hussain et al. 2006).

The conceptual framework of this study is based on literature gaps, particularly those related to access to credit. The literature identifies that access to microcredit is influenced by several factors

such as household-related factors (e.g., age, gender, education, income). The decision to access microcredit by SMEs is presumed to be determined not only by household and demographic factors but also the SMEs' characteristics. However, few studies have discussed access to microcredit from the perspective of the enterprise because of a lack of data on a wide range of enterprises, especially those involving SMEs because some do not have a good record. A recent study by Peprah & Ayayi (2016) analyses the key influences that affect small enterprises accessing microcredit in Ghana; owner and enterprise characteristics are taken into account. In addition, networking with the credit providers can enhance SMEs' access to microcredit. By networking with credit officials, SMEs may have better information about credit than those who do not have a network with a credit provider.

Understanding the factors that affect accessibility to microcredit is critical not only to improve and increase credit access for SMEs in terms of the microcredit providers in the credit market but also for the implementation of policies that aim to provide more microcredit accessibility to the targeted SMEs. Therefore, by focusing on the demand side, this study endeavours to examine SMEs' accessibility to microcredit without neglecting the enterprise characteristics by empirically investigating the key elements that influence the SMEs' accessibility to microcredit from various microcredit providers available in Malaysia such as commercial banks, development financial banks and microfinance institutions. This study assumes that SMEs' credit access is also affected by networking between the SMEs and credit providers.

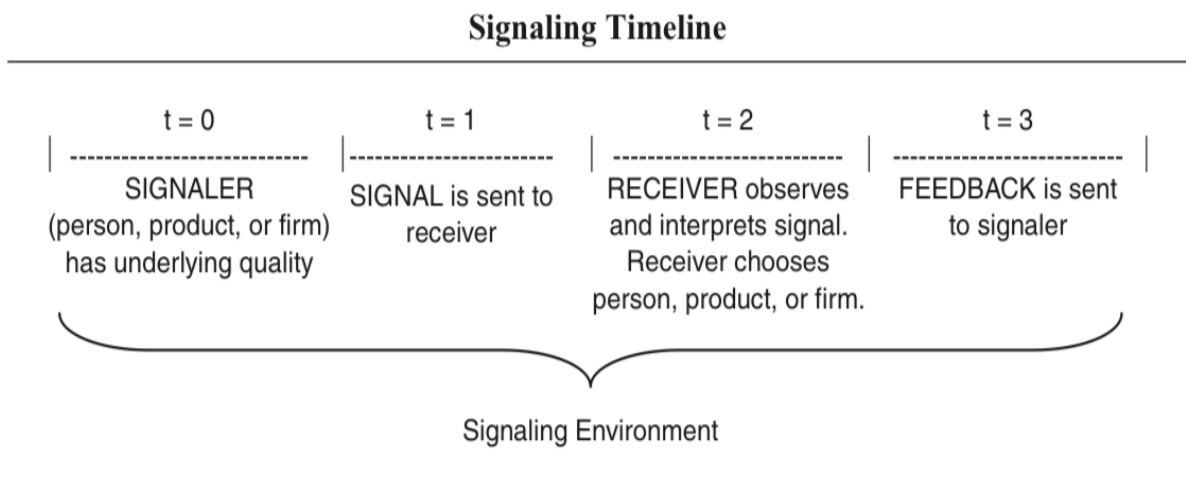
The conceptual framework used in our study is further reinforced by the signaling theory. The credit market is characterized by information asymmetries between lenders and borrowers (Milde & Riley, 1988). Information affects the decision-making processes used by two parties (individuals in household, businesses and government). In credit provision, there are possibilities for lenders to make Type I and Type II errors<sup>12</sup>. These types of errors are associated with whether banks decided to lend money to SMEs with low repayment capacity thus, banks would have missed out on potentially profitable lending. However, in the real world, it is possible that the banks make both good and bad decisions.

Informational asymmetries are particularly pronounced in financial markets. Borrowers typically know their wealth and risk better than lenders and entrepreneurs possess inside information about

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<sup>12</sup> The conditional probability to choose the right choice can be expressed in terms of type I errors (incorrectly rejecting a loan application), and the conditional probability to select the wrong choice can be expressed in terms of type II errors (incorrectly accepting a loan application). These errors occur due to incorrect interpretation of information thus the banks approved the application bad borrowers (DeYoung, Glennon, & Nigro, 2008)

their own projects for which they seek financing. Information asymmetries can be resolved through the signaling process, such as SMEs sending a positive signal to lenders or creditors. The signaling role is certainly essential when the credit institution has inadequate information on the SMEs (Rothschild and Stiglitz, 1971). For instance, collateral could have a signaling value for the bank when considering the creditworthiness of the SME (Bester 1985, 1987). The primary components of signaling theory in the form of a timeline is illustrated in Figure 4.1. The timeline includes two primary actors are the signaler and the receiver as well as the signal value. In this study, signalers are the SMEs and receivers are the microcredit providers.



*Note:*  $t =$  time.

**Figure 4.1 Signaling Timeline**

Source: Adapted from (Connelly, Certo, Ireland, & Reutzel, 2011)

Signalers are insiders (e.g., owners or managers of SMEs) who acquire information about the firms or organizations (Ross, 1977) that is not available to outsiders or receivers. Insiders obtain information, some of which is positive and some of which is negative, that outsiders would find useful. This information could include, for example, the enterprises' financial position. Insiders who have both positive and negative private information must decide whether to communicate this information to outsiders (receivers). Signaling theory focuses mainly on actions insiders take to communicate positive, imperceptible qualities of the insider intentionally. Insiders could potentially overwhelm outsiders with positive observable actions, but not all of these actions are used as signals. There are two main characteristics of efficient signals. The first is signal observability, which refers to the extent to which outsiders can notice the signal. For example, having external auditing is also thought to reduce firm opacity by increasing the transparency of financial accounts. Dharan (1993) points out

that the auditor's opinion is assumed to convey the risk characteristics of the firm to the lenders without error. Even though external auditing is costly but firms that choose to do so actually send a quality signal to potential lenders. The observable signal is necessary, but it is insufficient characteristic of a signal. The second characteristic of efficient signals is the signal cost (Bird & Smith, 2005). For instance, collateral could have a signalling value. After offering the collateral and obtaining the loan, SMEs wish to fulfil their obligations and repay on a timely basis to prevent losing the collateral. Thus, providing collateral can also solve the moral hazard problem (Boot et al., 1991). This implies that SMES with tangible assets can obtain financing fairly easy likewise bank's monitoring of the loan.

#### 4.1.2 Empirical Framework

DCM, developed by Dan McFadden in 1972, is commonly used in describing decision makers' choices among options. The empirical approach in accessibility to microcredit follows the DCM model and satisfies the underlying assumptions. First, the number of options must be mutually exclusive from the viewpoint of the decision maker which means the decision maker can choose only one among the options. To illustrate this, two alternatives can be defined as A and B and the decision made needs to be either A only or B only. Therefore, the decision by a given individual is considered discrete. Second, the set of options is exhaustive; all possible alternatives are included. Third, there is a *finite* number of options.

DCM specifies the probability that the decision maker selects an option among the number of options as a function of the utility derived from the options. Based on the theory of utility maximization, the decision maker is rational when choosing the option that maximizes his/her utility among 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 ( $C_m$ ) (Ben-Akiva & Lerman, 1985; Train, 2003).

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

$$P_n(i | C_m) = \Pr(V_{in} - V_{jn}) > \varepsilon_{in} - \varepsilon_{jn} \quad (4.1)$$

In DCM, the utilities of the options are treated as random to address concerns about observational insufficiencies arising from unobserved preference variations, unobserved characteristics and



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

$$U_{in} = V_{in} + \varepsilon_{in} \quad \forall i \in C_m \quad (4.2)$$

$$U_{jn} = V_{jn} + \varepsilon_{jn} \quad \forall i, j \in C_m \text{ and } i \neq j \quad (4.3)$$

The probability of choosing choice  $i$  can be rewritten when we substitute equations (4.2) and (4.3) into equation (4.1):

$$P_n(i | C_m) = \Pr(U_{in} > U_{jn}) = \Pr(V_{in} + \varepsilon_{in} > V_{jn} + \varepsilon_{jn}) \quad (4.4)$$

Therefore, 
$$P_n(i | C_m) = \Pr(V_{in} - V_{jn} > \varepsilon_{jn} - \varepsilon_{in}) \quad \forall i, j \in C_m \text{ and } i \neq j \quad (4.5)$$

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 greater than utility  $j$  is expressed as:

$$\begin{aligned} P_n(i) &= \Pr(U_{in} > U_{jn}) \\ &= \Pr(V_{in} - V_{jn} > \varepsilon_{jn} - \varepsilon_{in}) \end{aligned} \quad (4.6)$$

Thus, the probability of choosing the alternative  $j$  is expressed as:

$$P_n(j) = 1 - P_n(i) \quad (4.7)$$

Different binary choice models can be used by specifying different distributions for the unknown component of utilities ( $\varepsilon_{in}$  and  $\varepsilon_{jn}$ ). There are various statistical techniques to estimate the factors that influence access to microcredit such as probit and logit regression and ordinary least squares. Since the individual's decision to borrow or not is a binary choice decision, the use of the ordinary least squares (OLS) estimation method (Maddala, 1983) will yield biased, inconsistent estimators. Thus, this study uses logistic regression.

The logit model assumes the unknown component of utility ( $\varepsilon_n = \varepsilon_{in} - \varepsilon_{jn}$ ), also known as the error term, which is assumed to be logistically distributed given by the cumulative distribution function (CDF) term:

$$F(\varepsilon_n) = \frac{1}{1 + e^{-\mu\varepsilon_n}}, \text{ where } \mu > 0 \text{ and } -\infty < \varepsilon_n < \infty \quad (4.8)$$

The choice of probabilities of alternative  $i$  can be expressed as:

$$P_n(i) = \Pr(U_{in} > U_{jn})$$

$$\begin{aligned} P_n(i) &= \frac{1}{1 + e^{-\mu(V_{in} - V_{jn})}} \\ &= \frac{e^{\mu V_{in}}}{e^{\mu V_{in}} + e^{\mu V_{jn}}} \end{aligned} \quad (4.9)$$

A systematic component,  $V_{in}$ , is specified to be a linear parameter:

$$V_{in} = \beta X_{in} \quad (4.10)$$

Where:

$X_{in}$  is a vector of observable variables relating to alternate  $i$  and decision-maker,  $\beta$ ;  $\beta$  is a vector of parameters associated with the observed variables. With this specification, the choice of probabilities becomes:

$$P_n(i) = \frac{e^{\beta X_{in}}}{e^{\beta X_{in}} + e^{\beta X_{jn}}} = \frac{1}{1 + e^{-\beta(X_{in} - X_{jn})}} \quad (4.11)$$

In this study, the SMEs' decision to borrow microcredit, where  $Y_{in}$  depicts a dichotomous situation it takes the value 1 if SMEs borrow microcredit, and 0 otherwise.  $X_n$  is a vector of observable characteristics that will be discussed in the next section.

The systematic component of the utility is assumed to depend on the owner's and the SME's characteristics and other observable characteristics represented by  $X_{in}$ ; all unobserved

characteristics not included in the study are represented by the error term,  $\varepsilon_n$ , that is assumed to be independent and identically Gumbel-distributed (Ben-Akiva & Lerman, 1985).

When analysing the key factors that influence SMEs' access to microcredit, the dependent variable is binary. This will be denoted by one or zero where one represents access to microcredit and zero represents no access to microcredit. Access to microcredit of SMEs  $i$  can be defined as follows:

$$Y = 1 \text{ if } Y = \alpha Z_i + \varepsilon_i \geq 0$$

$$Y = 0 \text{ otherwise} \quad (4.12)$$

Where  $Y$  is access to credit which equals 1 if an SME has access to microcredit and 0 otherwise.  $Z$  is a vector of owner-characteristics: household characteristics; SME characteristics, distance<sup>13</sup> and networking.  $\varepsilon_i$  is the error term.

This study adopted a logit model to examine the factors that significantly influence credit access by SMEs in Malaysia. The logit model predicts the probability of an SME choosing to access microcredit can be expressed as follows:

$$P_n(Y_n = 1) = \Pr(U_{1n} > U_{0n}) = \Pr(Z_n > 0) = \frac{1}{1 + e^{-\beta X_n}} \quad (4.13)$$

Where  $Y_n$  equals 1 if the SME has access to microcredit and 0 otherwise;

$P_n$  is the estimated probability of SMEs having access to microcredit

Equation (4.13) represents the cumulative logistic distribution function in a non-linear form, in which it is difficult to interpret the coefficients. Therefore, it is common to write the model in terms of the log-odds ratio (Maddala, 2001). If  $P_n$  is the probability of accessing microcredit by SMEs, then the probability of not accessing microcredit or  $(1 - P_n)$  is given by:

$$(1 - P_n) = \frac{1}{1 + e^{\beta X_n}} \quad (4.14)$$

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<sup>13</sup> As suggested in the literature, the distance variable determines the access to credit (DeYoung, Glennon, & Nigro, 2008; Petersen & Rajan, 2002; Presbitero & Rabellotti, 2014). Furthermore, this variable is used as an instrument variable to solve endogeneity issues in the ESR model.

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

$$\frac{P_n}{1 - P_n} = \frac{1 + e^{\beta X_n}}{1 + e^{-\beta X_n}} = e^{\beta X_n} \quad (4.15)$$

Taking the natural logarithm of equation (4.15), yields the following:

$$\log\left(\frac{P_n}{1 - P_n}\right) = Z_n^* = \beta X_n \quad (4.16)$$

Where  $Z_n^*$  is the log-odds ratio, which is a linear function of the explanatory variables. By adding a constant term into equation (4.16), the estimated model is:

$$Z_n^* = \alpha + \beta X_n \quad (4.17)$$

where;  $\alpha$  is a constant term;

$\beta$  is a vector of coefficients for the independent variables  $X_n$ .

$X_n$  is a vector of independent variables including owner-characteristics; household characteristics; enterprise characteristics and networking.

To obtain efficient parameter estimates, the maximum likelihood estimation technique is applied since our model is a nonlinear function of coefficients ( $\beta_n$ ). The likelihood function, treated as a function of the unknown coefficients  $\beta$ , as in Verbeek (2008) is given by:

$$L(\beta) = \prod_{n=1}^N P\{Y_n = 1 | X_n; \beta\}^{Y_n} P\{Y_n = 0 | X_n; \beta\}^{1 - Y_n} \quad (4.18)$$

Accordingly, the log likelihood function is:

$$LL(\beta) = \sum_{n=1}^N Y_n \ln P_n + \sum_{n=1}^N (1 - Y_n) \ln(1 - P_n) \quad (4.19)$$

Where  $P_n = P\{Y_n = 1 | X_n; \beta\}$  denotes the probability of accessing microcredit. Using the formula for the logit probabilities, the log likelihood function for the logit model can be written as:

$$LL(\beta) = \sum_{n=1}^N Y_n \ln \left( \frac{e^{X_n \beta}}{1 + e^{X_n \beta}} \right) + \sum_{n=1}^N (1 - Y_n) \ln \left( \frac{1}{1 + e^{X_n \beta}} \right) \quad (4.20)$$

Hence, the maximum likelihood estimator  $\beta$  can be obtained by differentiating equation (4.20) with respect to  $\beta$ .

$$\frac{\partial LL(\beta)}{\partial \beta} = \sum_{n=1}^N \left[ Y_n - \frac{\exp(X_n \beta_n)}{1 + \exp(X_n \beta_n)} \right] X_n = 0 \quad (4.21)$$

The effectiveness of the logit model is weighed by the percentage of the variances of the dependent variable obtained by the independent variables. First, the indicator is labelled as Pseudo  $R^2$ , which indicates the higher the value of  $R^2$  the more effective the model in determining the behaviour of the dependent variable. Secondly, the model is correctly specified by determining the percentage correctly predicted. The predicted probability is over 50% if  $Y_n = 1$  or if the predicted probability of  $Y_n = 0$  is less than 50%, then  $Y_n$  is said to be correctly predicted. Furthermore, the presence of heteroscedasticity and multicollinearity in the model also needs to be checked. For these problems, the model may need to be corrected for optimal results.

#### 4.1.3 Explanation of the Variables

Accessibility in this study is measured using observations of SMEs' borrowing such as "borrowed microcredit" and "did not borrow microcredit". The independent variables include owner-manager characteristics, enterprise characteristics, networking and distance. The list of explanatory variables and expected signs of how each variable influences microcredit access are shown in Table 4.1.

**Table 4.1 Definitions of Independent Variables**

<b>Variable</b>	<b>Definitions/measurement</b>	<b>Expected sign</b>
Gender	Gender of SME's owner/manager is a vector of dummy variables where: $X_1=1$ for male, 0= for female.	+
Age	Age of SME's owner/manager is a vector of dummy variables indicating age group where: $X_2(1) = 1$ for below 35 years of age, 0=otherwise; $X_2(2) = 1$ for 36-45 years of age, 0=otherwise; and $X_2(3) = 1$ for 46 years of age and over, 0=otherwise.	-
Marital status	A vector of dummy variables for the marital status of owner/manager of SMEs where: $X_3(1) = 1$ if married; 0 otherwise.	+
Ethnicity	A vector of dummy variables for ethnicity of owner/manager of SMEs where: $X_4 = 1$ if ethnicity is Malay, 0=otherwise.	+
Education level	A vector of dummy variables for educational level of owner/manager of SMEs where: $X_5 = 1$ if higher than high school, 0 otherwise.	+
Financial training	A vector of dummy variables of financial training where: $X_6 = 1$ owner/manager received financial training, 0=otherwise	+
Experience	A vector of dummy variables of experience where: $X_7 = 1$ if owner/manager has work or business experience before running business and 0 otherwise).	+
Household size	Number in the household is a vector of a dummy variable where: $X_8(1) = 1$ for 3 or fewer people, 0=otherwise; $X_8(2) = 1$ for 4 people, 0=otherwise; $X_8(3) = 1$ for 5 or more people, 0=otherwise.	-/+
Income earners	A vector of dummy variables indicating number of income earners in the borrower's household where: $X_9(1) = 1$ for 1-2 people, 0=otherwise; $X_9(2) = 1$ for 3-4 people, 0=otherwise; $X_9(3) = 1$ for more than 4 people, 0=otherwise.	-/+
Household income	Household annual income was divided into four levels: RM1000 to RM2000; RM2001 to RM3000; RM3001 to RM4000; and over RM4000.	+/-
Age of enterprise	$X_{11}$ =Age of the firm (number of years established).	+
Sector	Sector the SME operated in is a vector of dummy variables where: $X_{12}(1) = 1$ firm is in manufacturing, 0=otherwise; $X_{12}(2) = 1$ firm is in service, 0= otherwise; and $X_{12}(3) = 1$ firm is in agriculture, 0= otherwise.	+
Size of enterprise	Size of the enterprise (based on number of employees in 2014).	-
Ownership	Ownership of the firm is a vector of dummy where: $X_{14}(1) = 1$ if firm is sole proprietor; 0 otherwise	-
Networking	Network variable includes the extent to which the firm networks with a commercial bank, social organizations, NGO, microfinance organizations, and business associations measured on a scale of 0 = "Not at all" to 5 = "very extensive".	+
Distance	Distance between borrower and microcredit provider (continuous variable).	-

The choice of the explanatory variables used in the model is based on theory, previous studies and data availability. The expected signs indicate positive or negative hypothesised relationships between the variables and SMEs' microcredit accessibility. For example, the expected sign of (+) for gender indicates it is hypothesized to positively affect the enterprise's accessibility to microcredit.

Gender, age, education and household income are the common factors used to comprehend the factors affecting access to credit by individuals. The literature on gender and access to credit are quite interesting but have mixed results. In this study, gender is hypothesised to positively affect access to microcredit. It is common in Malaysia for men to make the important decisions since men are the main income earners of the household. Various studies showed that men and women differ in terms of access to credit and suggest that female-owned SMEs experience difficulty in obtaining credit because credit institutions' perceptions discriminate against female business owners, albeit that women demand credit (Okurut, Olalekan, & Mangadi, 2012; Riding & Swift, 1990). Women are perhaps prevented from obtaining microcredit because of the perception of low repayment capacity reflected by the weakness of control over economic resources compared with men. In contrast, entrepreneurial women are more likely to access credit with ease compared with male entrepreneurs (Atta, 2012). Some studies found insignificant differences between male-owned and female-owned businesses (Baiyegunhi & Fraser, 2014; Watson et al., 2009). The age of the SME owner is hypothesized to negatively affect an SME's access to microcredit. Mohamed (2003) and Okurut (2006) show that as people age the probability of borrowing from credit sources reduces. Moreover, older owners or managers reduce their propensity to access microcredit because they may find it challenging and complex to comprehend the processes and loan conditions of microcredit programmes. The education variable has a positive sign regarding access to credit. This means a higher educational level increases SME owners' chances to access microcredit. This specification of education is consistent with Pepurah & Ayayi (2016) who conclude that the household head with higher education significantly influences access to microcredit. It is, therefore, established that a higher educational level fosters participation in microcredit. The SMES' owners who are not knowledgeable enough to make effective financial choices find their accessibility to credit hindered.

Another important variable is financial training. Those owners who received financial training are hypothesised to be positively associated with access to microcredit compared with those who do not have such training. Financial training can be a proxy for financial literacy. Financial training can enhance SME owners' financial knowledge and increase their chances of success in borrowing (Akudugu et al., 2009). SME owners with better financial knowledge may keep comprehensive financial records and are more likely to have access to credit. Furthermore, it is assumed that

financial training received by SME owners might help them to go through the borrowing process with a microcredit provider. Thus, financial training further develops financial literacy since experts agree that self-financial behaviour comes from a knowledge of finance (Hilgert, Hogarth, & Beverly, 2003).

Experience is hypothesized to positively affect SMEs' access to microcredit. Experience is measured by whether SME owners have work or business experience before starting their business. Hanedar, Altunbas, & Bazzana (2014) propose that the positive correlation between owners' work experience is likely to help reduce the firm's financing obstacles. It is expected that the probability of access to microcredit is greater for those who have work or business experience. Microcredit providers may require additional traits of borrowers such as work or business management experience since that lessens the chance of default or business failure.

Economic burden is always tied to the number of income earners and the needs of a family as determined by household size and composition (Voydanoff, 1990). Both the household size and income earner dummy variables exhibit ambiguous signs of effect on accessibility to microcredit. For instance, with a larger number of income earners it may be considered that the SMEs are less constrained financially but, depending on how many are in their families the reverse may be true. Respondents with a small household size may have fewer responsibilities, thus they have low demand for credit than those with larger households and more responsibilities on their business which forces them to look for credit to augment their working capital (Balogun & Yusuf, 2011).

In this study, household income also exhibits ambiguous effects. For example, an individual with a higher income may be less constrained financially and does not require any additional credit. This has a negative effect on SMEs' demand for credit. Besides, the microcredit provider puts a limit on household income as a criterion for borrowing from a microcredit institution, i.e., the probability of accessing microcredit increases with a low household income. An often-hypothesized idea is that the ethnic majority can access credit more easily than a minority (Biggs et al., 2002; Bruder et al., 2011). The question in this study is whether there are differences between Malay-owned firms and ones owned by other ethnicities in accessing microcredit. Therefore, in this study, the ethnicity dummy variable hypothesises a positive correlation with access to microcredit. The literature suggests that the educational level of SME owners makes some difference to access to microcredit. The education dummy variable is hypothesized to have a positive effect on the probability of accessing microcredit. SME owners with a higher educational level are likely to borrow microcredit. Educated SME owners are viewed as possessing more skills and have more exposure to the external risks, hence they might require more credit to sustain their business than uneducated SME owners. In addition, educated



SME owners may have a better understanding of the terms and conditions of the micro loan and are willing to comply with the requirements set up by the microcredit providers (Duvendack, Palmer-Jones, & Vaessen, 2014; Okurut et al., 2012).

SME characteristics such as age of the enterprise, sector, size of the enterprise and ownership need to be considered because credit access may largely be influenced by such factors. Age of the enterprise is hypothesised to positively correlate with access to credit. In accessing credit from financial institutions business experience plays a vital role. Younger enterprises have a limited or no credit track record and are known as less experienced entrepreneurs (Harvie et al., 2013). Businesses with more years of experience are more likely to have access to credit than those with fewer years in business. This is because SME owners with more years in operation are in a better position to repay their loan than beginners. A study by Abunyuwah and Blay (2013) found that entrepreneurs with more years of experience have a higher probability of accessing credit from formal financial institutions than their counterparts with relatively few years of experience in business. In contrast, Abdullah and Manan (2011) found that the impact of firm age in Malaysia on accessibility to credit is not significant because access to credit relies on the profit of the firm. Sector is also expected to have a strong influence on accessing microcredit. This study includes sector to test whether there is a difference in accessibility to microcredit for different sectors of the economy. For instance, Le (2012) found that the probability of obtaining a bank loan is higher if firms were engaged in the service sector followed by some manufacturing industries. It is hypothesized that SMEs involved in the manufacturing or service sectors will have more access to microcredit than the agricultural sector because the lender perceives the risky nature of agriculture (Umoh, 2006).

Size of enterprise also determines SMEs' probability of accessing microcredit. The relationship between the dependent variable and size of the enterprise shows mixed results. According to Allen et al. (2012), Beck et. al (2008) and Nguyen & Luu (2013), large firms are most likely to have fewer constraints when accessing credit because they have many alternative funding sources. However, small sized firms have a higher credit risk that limits their access to bank credit. Therefore, in this study, the size of the enterprise is predicted to have an inverse relationship with access to microcredit because microcredit providers in Malaysia generally target credit schemes at the SMEs of smaller size as indicated by sales turnover or number of employees (SME Corporation Malaysia, 2015a). On the other hand, Gemechu & Reilly (2011) found that access to credit is not affected by firm size. Similarly, ownership of the SME is hypothesized to negatively correlate with access to credit. The literature reveals different financing behaviour across firm ownership. Nguyen & Luu (2013) found no significant relationship between types of ownership of firms and credit constraints.

Networking with the commercial banks, non-governmental organizations, microfinance institutions and business associations are important factors in determining access to microcredit. The literature reveals networking positively affects accessibility with traditional banks, but there is no evidence specifically for microcredit. Therefore, networking is hypothesised to be positively related to access to microcredit.

This study sought to find the influence on SMEs of the distance to the nearest microcredit provider on access to microcredit. In the literature, distance is always associated with high transaction cost so it tends to decrease access to credit (Garikipati, 2012; Ibrahim & Bauer, 2013). Therefore, distance to the nearest microcredit provider such as an MFI, commercial bank or DFI is expected to be inversely related to access to microcredit. The nearer the distance between the borrower and credit institution, the higher the probability of access to microcredit than for those residing far away from the microcredit providers.

## **4.2 Factors in Malaysia that Influence the Choice of Microcredit Provider by SMEs**

In this section, we analyse SMEs' behaviour regarding the choice among different microcredit options. In Malaysia, microfinance involves the participation of commercial banks and development financial banks to bridge financial gaps by providing microcredit to SMEs. To illustrate, Agro Bank, one of the Malaysian DFIs, offers microcredit to SMEs in the agricultural sector. Seven commercial banks, Maybank, CIMB Bank, AMBank, EonCap Islamic Bank, Alliance Bank, Public Bank and United Overseas Berhad, offer both conventional and Islamic microfinance products and services to clients (Nawai & Mohd Shariff, 2011). According to Afande (2015) different lenders offer different credit packages to borrowers to meet their specific needs. This study assumes that SMEs' preferences for credit are defined over a set of owner characteristics, SME characteristics, loan characteristics and networking with MFIs and commercial banks. Therefore, aside from determining the factors that influence accessibility to microcredit, this study attempts to determine the factors that affect the choice of microcredit provider. Specifically, this study attempts to elicit information on the choice of microcredit available in Malaysia restricted to only three options. A set of variables may influence the behaviour of microcredit borrowers in borrowing from different Malaysian microcredit providers.

However, a major limitation in this study is the limited literature that investigates the factors that influence microcredit providers' choices. The determinants of financing preferences cited in the literature relate to SMEs (Zabri & Lean, 2014; Mat Nawi, 2015; Daskalakis, Jarvis, & Schizas, 2013). These studies concentrated on the borrowing behaviour of SMEs towards external financing or

internal funds. However, to the best of the author's knowledge, there is little attention are given to the choices of microcredit providers. Takahashi, Higashikata and Tsukada (2010) pointed the dominant providers of microcredits in the Indonesian market have been large commercial banks but no empirical research has carried out in understanding the reason why SMEs choose particular microcredit providers.

#### 4.2.1 Model Specification

SME owners are asked to indicate their choice of microcredit provider. OLS regression analysis is an inappropriate technique to use for choices that consist of multiple dependent variables. The dependent variable denoted as choice is unordered and categorical; the choice is for more than two categories, thus, MNL was chosen to analyse the factors influencing the choice of microcredit provider by SMEs in Terengganu, Malaysia. It is assumed that all microcredit providers are mutually exclusive. The various choices of microcredit providers from which SMEs can access credit are classified as a dependent variable that takes only one of  $j$  categories  $1, 2, \dots, k$  (different choices of microcredit provider).

In this study,  $j$  consists of three categories namely, borrow from microfinance institution, commercial bank or development financial institution. Thus,  $j=1, 2, \text{ or } 3$ . These numerical values have no particular order i.e., are assigned arbitrarily. If we assume a single explanatory variable,  $x_i$ , the probability of SME  $i$  choosing alternatives  $j=1, 2, 3$  are (Hill, Griffiths, & Lim, 2011, pp. 600):

$$p_{i1} = \frac{1}{1 + \exp(\beta_{12} + \beta_{22}x_i) + \exp(\beta_{13} + \beta_{23}x_i)}, j = 1 \quad (4.22a)$$

$$p_{i2} = \frac{\exp(\beta_{12} + \beta_{22}x_i)}{1 + \exp(\beta_{12} + \beta_{22}x_i) + \exp(\beta_{13} + \beta_{23}x_i)}, j = 2 \quad (4.22b)$$

$$p_{i3} = \frac{\exp(\beta_{13} + \beta_{23}x_i)}{1 + \exp(\beta_{12} + \beta_{22}x_i) + \exp(\beta_{13} + \beta_{23}x_i)}, j = 3 \quad (4.22c)$$

The parameters  $\beta_{12}$  and  $\beta_{22}$  are specific to the second alternative, and  $\beta_{13}$  and  $\beta_{23}$  are specific to the third alternative. However, the parameters cannot be specified because they generate similar probabilities for the observed outcomes. Therefore, the parameters need to be set to distinguish the

options. To do this, the first-choice category is used as a reference cell or base category against which the other choices are compared. The first-choice category  $j=1$  is set to zero. The choice base category can be arbitrary and any of  $j$  categories can be used to compare between any groups of optional categories. In this study, the choice of MFIs will be used as the base category. Let the probability that SME  $i$  chooses choice  $j$  be conditional on specific characteristics  $X_{ij}$  and be given as (Hill et al., 2011):

$$P_{ij} = \frac{\exp(\beta_{ij} X_{ij})}{\sum_{k=1}^3 \exp(\beta_{ik} X_{ij})} \quad \mathbf{j=0,1,\dots,J} \quad (4.23)$$

The log likelihood function for the MNL can be written as follows:

$$l = \sum_{i=1}^n \sum_{j=1}^k y_{ij} \text{Log}(P_{ij}) \quad (4.24)$$

Where  $y_{ij}$  is a dummy variable that indicates the choice made by SME  $i$ . If choice 1 is selected, then  $y_{i1}=1$ ,  $y_{i2}=0$  and  $y_{i3}=0$ . If choice 2 is selected, then  $y_{i1}=0$ ,  $y_{i2}=1$  and  $y_{i3}=0$ .

**Table 4.2 Definitions of Variables in the Multinomial Logit Model**

<b>Variable Name</b>	<b>Definitions/measurement</b>	<b>Expected Sign</b>
Gender	Gender of SME owner/manager is a vector of dummy variables where $X_1= 1$ for Male or $0=$ Female.	-/+
Age	Age of SME owner/manager is a vector of dummy variables indicating age group where: $X_2(1) = 1$ for below 35 years, $0=$ otherwise; $X_2(2) = 1$ for 36-45 years, $0=$ otherwise; and $X_2(3) = 1$ for 46 years and, $0=$ otherwise.	+
Married	Marital status of the owner/manager of SMEs is a vector of dummy variables where: $X_3(1) = 1$ if married, $0$ otherwise.	+
Ethnic	Ethnicity of the owner/manager of SMEs is a vector of dummy variables where: $X_4= 1$ if ethnicity is Malay, $0=$ otherwise.	-/+
Age of enterprise	$X_5=$ Age of the firm (number of years establishment)	+
Sector	Sector of the enterprise is a vector of dummy variables indicating where: $X_6(1) = 1$ firm is in manufacturing, $0=$ otherwise; $X_6(2) = 1$ firm is in service, $0=$ otherwise; and $X_6(3) = 1$ firm is in agriculture, $0=$ otherwise.	-/+
Size of enterprise	$X_7=$ Size of the firm (based number of employees in 2014)	+
Ownership	A vector of dummy variables indicating ownership of the firm where: $X_8= 1$ firm is sole proprietor; $0$ otherwise.	-/+
Loan amount	A vector of dummy variables indicating the loan amount that SMEs borrowed per one time where: $X_9= 1$ if borrowed over RM25, 000; $0$ otherwise.	+
Loan process	The process of the loan is a vector of dummy variables where: $X_{10} = 1$ if it takes a month to process; $0$ otherwise.	-/+
Loan duration	Loan duration of the largest loan is a vector of dummy variables where: $X_{11}(1) = 1$ if the loan duration is short term loan $0=$ otherwise; $X_{11}(2) = 1$ if the loan duration is medium term= otherwise; and $X_{11}(3) = 1$ if the loan duration is long term, $0=$ otherwise.	-/+
Mode of interest payment	$X_{12}$ is a vector of dummy variables taking value of $1$ if interest payment mode is monthly, $0$ otherwise.	-/+
Networking	$X_{13}$ is networking, on scale from $0 =$ "Not at all" to $5 =$ "very extensive". Networks variable includes the extent to which the firm has networks with commercial banks and microfinance organizations.	+
Distance	$X_{14}=$ the distance in kilometres	-

The MNL model can also be interpreted in terms of the odds ratio or relative risk ratio (RRR). It expresses how many times more likely category  $j$  is to be chosen relative to the base category or reference cell and is written as follows:

$$\frac{P(y_i = j)}{P(y_i = 1)} = \frac{p_{ij}}{p_{i1}} = \exp(\beta_{1j} + \beta_{2jx_i}), j = 2, 3 \quad (4.25)$$

The effect on the odds ratio of changing the value of  $x_i$  is given by the derivative (Hill et al., 2011):

$$\frac{\partial(p_{ij} / p_{i1})}{\partial x_i} = \beta_{2j} \exp(\beta_{1j} + \beta_{2jx_i}), j = 2, 3 \quad (4.26)$$

The exponential function  $\exp(\beta_{1j} + \beta_{2jx_i})$  is always positive. Hence, the sign of  $\beta_{2j}$  indicates  $x_i$ , the relevant explanatory variable used (see Table 4.2) will make the  $j^{\text{th}}$  category less or more likely in relation to the first category, i.e., a microfinance institution.

Before running the MNL model, multicollinearity test using the variance inflation factor (VIF) and heteroscedasticity using the Breusch-Pagan test were tested for all explanatory variables.

### 4.3 Determinants of the Financing Rate Charged on Microcredit

Since microcredit was introduced in late 1970s, there has been strong criticism of microcredit organisations charging the highest interest rates and this has attracted the attention of policy makers around the world. Many studies have analysed the determinants of interest rates in the standard banking literature, but little empirical investigation of interest rates exists in the field of microfinance. Previous studies have examined the determinants of interest rates on the micro lender side and there are two main arguments common in the literature, the costs of operation and the sustainability of MFIs, that drive the high interest rates (Fernando, 2006; Rosenberg et al., 2013, 2009). Nevertheless, microfinance institutions still charge very high interest rates even though the microfinance market is very competitive. Aside from determining the factors that influence accessibility to microcredit, this study also attempts to increase understanding of the interest rates charged by microcredit providers. The determinants of microcredit interest rates on the borrower side have not been widely explored. A study by Dorfleitner et al. (2013) takes into account borrower factors that may influence the microcredit interest rate. Hence, this study fills a gap by exploring the factors of interest rates charged to borrowers.

#### 4.3.1 Model Specification

This study uses two different OLS models<sup>14</sup> to determine the factors that affect the financing rate. The respondents were asked what the lowest and highest financing rates were that they paid in 2014. The respondents needed to indicate the highest and lowest rates that they paid in 2014. The OLS models follow Nguyen (2014); Petersen & Rajan (1994) and Rand (2007); as:

$$Y_{lowest} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots \dots \dots \beta_{15} X_{15} + \varepsilon \quad (4.27a)$$

$$Y_{highest} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \dots \dots \dots \beta_{15} X_{15} + \varepsilon \quad (4.27b)$$

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<sup>14</sup> Model 1 indicates the lowest loan rate whilst Model 2 indicates the highest loan rate that the borrower received in 2014.

**Table 4.3 Definitions and Measurement of Variables used in the OLS model**

<b>Variable Name</b>	<b>Definitions/measurement</b>	<b>Expected sign</b>
<b>Gender</b>	Gender of SME owner/manager is a vector of dummy variables indicating the gender of the owner/manager of SMEs where: $X_1 = 1$ for Male or 0=Female.	+/-
<b>Age</b>	Age of SME owner/manager is a vector of dummy variables indicating age group where: $X_2(1) = 1$ for below 35 years, 0=otherwise; $X_2(2) = 1$ for 36-45 years, 0=otherwise; and $X_2(3) = 1$ for 46 years and, 0=otherwise.	+
<b>Married</b>	A vector of dummy variables for the marital status of the owner/manager of SMEs where: $X_3(1) = 1$ if married, 0 otherwise.	-
<b>Education</b>	A vector of dummy variables for the educational attainment of the SME owner/manager where: $X_4(1) = 1$ if higher than high school, 0 otherwise.	+
<b>Age of Enterprise</b>	$X_5 =$ Age of the firm (number of years of establishment)	-
<b>Sector</b>	A vector of dummy variables indicating the sector of the firm where: $X_6(1) = 1$ firm is in manufacturing, 0=otherwise; $X_6(2) = 1$ firm is in service, 0= otherwise; $X_6(3) = 1$ firm is in agriculture, 0= otherwise.	+/-
<b>Size of Enterprise</b>	Size of the firm (based on number of employees in 2014)	-
<b>Loan Amount</b>	$X_7$ is a vector of dummy variables indicating the loan amount that SMEs borrowed per one time where: 1= over RM25, 000; 0 otherwise.	+
<b>Loan Duration</b>	A vector of dummy variables indicating the duration of the largest loan where: $X_8(1) = 1$ if the loan duration is short term loan 0=otherwise; $X_8(2) = 1$ if the loan duration is medium term= otherwise; and $X_8(3) = 1$ if the loan duration is long term, 0= otherwise.	+/-
<b>Mode of Interest Payment</b>	$X_9$ is a vector of dummy variables taking the value of 1 if the interest payment mode is monthly, 0 otherwise.	+/-
<b>Choice of Microcredit Provider</b>	A vector of dummy variables indicating the choice of microcredit provider where: $X_{10}(1) = 1$ if the choice is MFIs loan 0=otherwise; $X_{10}(2) = 1$ if the choice is a commercial bank = otherwise; and $X_{10}(3) = 1$ if the choice is DFIs, 0= otherwise.	+
<b>Networking</b>	$X_{11}$ is networking, on a scale from 0 = "Not at all" to 5 = "very extensive". The network variable includes the extent to which the firm networks with commercial banks and microfinance organizations.	-
<b>Account Books</b>	$X_{12}$ is a vector of dummy variables taking a value of 1 if the SME has account books, 0 otherwise.	-



The dependent variable in equation (4.27) is the interest rate charged by microcredit providers to the SME. The independent variables include owner characteristics, SME characteristics, loan characteristics, networking, the choice of microcredit providers and creditworthiness measured by the SME's accounts books (see Table 4.3).

An inverse relationship is hypothesized between gender and interest rate. Based on worldwide data, Dorfleitner et al. (2013) discovered that women borrowers are charged a higher interest rate by MFIs. In addition, Hermes et al. (2011) observed that women are less efficient than men therefore microcredit providers tend to charge higher interest rates. The educational level and interest rate are hypothesised to be positive. Education can be a proxy for financial literacy, which refers to the knowledge, abilities, and attitudes required to adopt suitable money management practices for incomes, saving, borrowing and making an investment. For example, a better-educated client reduces MFIs' operating costs thus leading to a fall in the interest rate charged to borrowers.

For SME characteristics<sup>15</sup>, the age of the enterprise is negatively related to the interest rate. Titman and Wessels (1988) argued that older firms might be less risky and therefore less prone to financial distress and can generate debt at lower interest rates. Bigger enterprises have greater bargaining power than small enterprises when dealing with finance providers and, therefore, bigger enterprises have more chances to get bank loans, trade credit from suppliers and liabilities from other sources. For the sector variable, a significant difference exists between the economic sector and interest rate. SMEs engaged in the manufacturing and service sectors are expected to have lower interest rates than the agricultural sector. This is because of the risk that the agricultural sector confronts from natural hazards such as storms, floods and droughts. The greater the risk, the greater the loan rate charged by the lender. The risk associated in lending affects the price of microcredit. Like other loans, microcredit must be repaid. For this reason, microcredit providers must assess the risks of SMEs (Serrano-Cinca et al., 2016).

A positive relationship between short term loan duration and interest rate is documented in the literature. Short term loan duration entails high administration costs because it requires greater servicing and needs to be monitored over time. Lenders tend to charge higher interest rates for short term loans. In contrast, Rose & Hudgins (2005) found that long term loans often carry higher interest rates because of the maturity risk since there are greater opportunities of losses over time. This is because longer maturity increases the borrower's likelihood to default due to job or income

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<sup>15</sup> SMEs characteristics included in our regression are quite standard in the banking literature (see Berger and Udell (1996) or Petersen and Rajan (1995)).

interruption (Ramos-Garay, 2006). For example, disruption in cash inflow in the business due to a decrease in sales will affect repayment and thus would expose the borrower's risk to the bank if the borrower borrows for a long period of time. Furthermore, the loan amount is hypothesized to be positively associated with the interest rate charged. Similarly, the mode of interest payment is hypothesized to have a negative relationship with interest rate charged. This study hypothesizes that there is significant difference between MFIs, commercial banks and DFIs and the interest rates charged i.e., the interest rate charged depends on the type of microcredit provider. It is hypothesized that MFIs tend to charge higher loan rates than commercial banks and DFIs. For instance, development financial institutions receiving large subsidies from the government may charge much lower interest rates than MFIs (Fernando, 2006). MFIs tend to charge higher loan rates to deliver better services and thus limits are imposed on the capacity to develop through the low loan rates.

The networking variable is hypothesized to positively correlate with interest rate. Nguyen & Ramachandran (2006) and Rand (2007) found that firms having a previous borrowing relationship with a bank are able to borrow at lower interest rates and have a higher probability of obtaining a loan. Titman and Wessels (1988) found that firms with a lesser relationship with financial institutions make those small firms less preferred clients and they are charged high interest rates.

Previous studies include creditworthiness as measured by collateral to examine the factors that affect interest rates charged on bank loans (Rand, 2007). In contrast, this study does not include the collateral variable to measure the creditworthiness because microcredit does not require collateral (Serrano-Cinca et al., 2016). For that reason, and to investigate whether creditworthiness matters in the interest rate, having accounts books was included in the model.

## **4.4 Impact of Microcredit on SME Performance**

### **4.4.1 Outcome Indicators of Impact Evaluation**

For SMEs, no business performance data are reported publicly. A researcher must rely on self-reporting measures and it becomes a more challenging task because SMEs do not keep records of their business transactions. The most popular indicators used to determine the performance of SMEs are sales growth and employment growth (Akoten et al., 2006; Ayyagari et al., 2010; Oh et al., 2009). Following Ayyagari et al. (2010), annual total sales and annual total employment data are used in this study to construct the following measures of an SME's growth. First, sales growth is the log change in total sales by SME  $i$  for the current period compared with total sales reported  $r$  two years ago.

Second, employment growth is the logarithm of the number of workers<sup>16</sup> in SME  $i$  for the current period compared with that reported two years ago. The transformation of the dependent variables (outcomes) by taking logarithms has the advantage of reducing the range of the variables and making estimates less sensitive to extreme values (Wooldridge, 2009).

In practice, total sales are easier than some other indices and are much more likely to be recorded by SMEs. Sales growth can be indicated as business resilience. As suggested by Barkham et. al (1996) when measuring business growth, it should be captured by sales. In addition, employment growth refers to the ability of SMEs to contribute to job creation. In a World Bank study on SME projects, the most frequently cited reason is to create employment (World Bank, 2007). Therefore, employment growth is a key indicator by which to measure SME performance.

#### 4.4.2 Propensity Score Matching - Model Specification

The major challenge in estimating the impact of microcredit on SME performance is obtaining a reliable estimate of counterfactual outcomes - what would have happened to those who received microcredit if they had not received it. PSM is a common method to estimate causal treatment effects. The use of the propensity score-matching method is to correct for sample selection bias because of observable differences between the treatment and control groups. The fundamental idea of PSM is to match participants and non-participants with identical observable characteristics ( $X$ ). The three pillars of this model are the individual who is SME  $i$ ; treatment which takes the binary treatment  $D=1$  if the SME received microcredit and 0 otherwise; and the potential outcomes. The impact of a treatment on SME  $i$ , can be written as:

$$\delta_i = Y_{1i} - Y_{0i} \quad (4.28)$$

In the literature, two parameters are most commonly used for estimation (Caliendo & Kopeinig, 2008). First, the average treatment effect (ATE), which can be defined as the difference between the expected outcome of treated and control observations (Caliendo & Kopeinig, 2008). Second, the average treatment effect on the treated (ATT), which is the difference between the outcome of treated and the outcome of the treated if they have not been treated. To illustrate:

$$\delta_{PSM}^{ATT} = E(Y_1|X, D=1) - E_X \left[ E(Y_1|X, D=0) | D=1 \right] \quad (4.29)$$

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<sup>16</sup> SMEs were asked how many full-time workers they employed; casual or part time workers are not included.

This study focuses on the ATT parameter (Ghalib, Malki, & Imai, 2014; Peprah & Ayayi, 2016; Silva, 2012). The estimation of ATT must satisfy two underlying assumptions:

*Conditional independence*  $(Y_1, Y_0) \perp\!\!\!\perp D \mid X$ : This assumption is also known as unconfoundedness or selection of observables; it requires that all variables relevant to the probability of receiving the treatment be observed and included in  $X$ . This allows the untreated units to be used to construct an unbiased counterfactual for the treatment group.

*Common support or Overlap*  $0 < P(D = 1 \mid X) < 1$ : This implies that, for each value of  $X$ , there is a positive probability of being both treated (microcredit borrower) and untreated (non-borrower). This assumption of common support ensures that there is sufficient overlap in the characteristics of treated and untreated units to find adequate matches. SME<sup>*i*</sup> that fall outside the common support region will be discarded and for these SME<sup>*i*</sup> the treatment effect will not be evaluated.

The treatment assignment is said to be 'strongly ignorable' when both these assumptions are satisfied (Rosenbaum & Rubin, 1983).

Additionally, using the same survey questionnaire for the treatment and control groups and selecting them from the same locality can make PSM produce low bias estimates (Dehejia & Wahba, 2002). The identical observable characteristics between the treatment and control groups raises the likelihood of getting matches and hence reduces bias. In addition, potential bias such as non-random placement and self-selection on observed characteristics in participation of microcredit, can be controlled using the PSM method.

In assessing the impact of the microcredit programme on SME performance, this study follows the impact evaluation framework proposed by Oh et al. (2009) whose study evaluated the effect of credit guarantee in the Korean manufacturing sector using propensity score matching. Our estimation strategy is based on comparing the treated and non-treated SMEs. The PSM method includes the following steps.

First, divide the observations into two groups; the SMEs that borrow microcredit are considered the treatment group and SMEs that did not borrow as the control group. Let  $D = 1$  denote the treated observation and  $D = 0$  the control observations. Second, estimate the binary outcome model; this study uses the logit model for the propensity of observations to be assigned into the treated group. The variables such as owner characteristics, SME characteristics and networking may affect the

likelihood of being assigned into the treated group. Third, match the observations from the treated and control groups based on the propensity score. Several matching methods are available such as kernel, nearest neighbour, radius and stratification. This is to find the best possible match for the treated observations. To show the robustness of the estimation, this study applied kernel matching with replacement and radius matching for the comparison to evaluate the impact of microcredit on SME performance using cross sectional data. Kernel matching is used to match all the treated group with a weighted average of all the control group with weights that are inversely proportional to the distance between the propensity score of treated and controls (Arun, Imai, & Sinha, 2006). Radius matching uses the weighted average of all individuals in the control group within the default radius of 0.01. After matching, the unmatched respondents are discarded and not used for further analysis to estimate the impact of the treatment. Fourth, calculate the average treatment effects by comparing the outcomes  $y$  between the treated and control observations after matching:

$$y = \begin{cases} y_1 & \text{if } D = 1 \\ y_0 & \text{if } D = 0 \end{cases} \quad (4.30)$$

Where;  $y_1$  is the outcome for treatment group (SMEs with microcredit) and  $y_0$  is the outcome for control group (SMEs without microcredit)

The coefficient of the average impact of treatment on the treated microcredit scheme  $\delta_{PSM}^{ATT}$  is obtained using the propensity score matching method, based on equation (4.29) and rewritten as:

$$\delta_{PSM}^{ATT} = E(Y_1|X, D=1) - E_X [E(Y_1|X, D=0)|D=1] \quad (4.31)$$

Where:

<b>Variables</b>	<b>Variable indicators</b>
$Y_1$	Outcome of interest (SME performance) –sales growth and employment growth, Log differences between 2012 and 2014, e.g., $\log(\text{Total Sales 2014}) - \log(\text{Total Sales 2012})$
$D$	$D$ is microcredit participation; $D = 1$ if SMEs with microcredit; $D = 0$ otherwise.
$X$	Covariate of the observed factors including SME owner/manager characteristics (gender, age, marital status, and financial training); number of income earners; SME characteristics (age of enterprise, ownership type and sector).

The expected value of ATT is defined as the difference between the expected outcome values with and without treatment for those who participated in the treatment (Caliendo & Kopeinig, 2008). To control for selection bias based on observable factors, a set of covariates  $(X)$  was included. The set of controlling covariates should meet the conditions of the matching controlling variables.

The shortcoming of the PSM model is addressing the issue of selection bias by controlling for only observable factors (Dehejia & Wahba 2002). The PSM method fails to account for time invariant unobservable factors when addressing the issue of selection bias. Since panel data are available for the outcome indicators, the Difference-in-Difference (DID) method is used and is discussed in the next section.

#### 4.4.3 Difference in Difference Estimation Strategies

The DID model is applied since panel data on outcomes are available. DID can minimize the selection problem on unobservable factors. Difference-in-difference compares before (b) and after (a) estimates for the microcredit borrower and non-borrower. The DID regression is:

$$Y_{it} = \beta_0 + \delta_0 d2_t + \beta_1 P_i + \gamma M_{it} + \varepsilon_i \quad (4.32)$$

Based on the standard DID model above,  $Y_{it}$  is the outcome of interest of SME  $i$  at period  $t$ . The outcome indicators are sales growth and employment discussed in the prior section. The time dummy variable is represented by  $d2_t$ , for which  $t=1$  means after obtaining credit and  $t=0$  before obtaining microcredit,  $P_i$  is a group dummy variable and is equal to 1 if SME  $i$  borrows microcredit and 0 otherwise.  $M_{it}$  is an interaction between  $d2_t$  and  $P_i$ , which is equal to one if SME  $i$  borrows microcredit and 0 otherwise. If the error term is correlated with treatment status, it is clear that estimation bias emerges,  $\text{corr}(e_{it}, M_{it}) \neq 0$ .

An unbiased estimate can be obtained by subtracting the difference outcome of the treatment group (microcredit borrower) over the two periods and similarly, for the control group. Then, one subtracts the difference between the treated and control groups over two periods. To illustrate, the average treatment effect on the treated group is specified as follows:

$$\delta_{DiD}^{ATT} = E(Y_{i,t+1} - Y_{i,t} | D=1) - E(Y_{i,t+1} - Y_{i,t} | D=0) \quad (4.33)$$

$$\delta_{DiD}^{ATT} = (\bar{Y}_{i1,t+1} - \bar{Y}_{i1,t}) - (\bar{Y}_{i0,t+1} - \bar{Y}_{i0,t}) \quad (4.34)$$

In summary, this study followed previous studies on impact evaluation that combine the PSM and DID methods to match the treatment and control groups on observable characteristics and control selection bias that arises from unobserved heterogeneity (Imai & Azam, 2012; Lyngdoh & Pati, 2013). This study extends this methodology by measuring the causal effect between access to microcredit and SME performance by taking into account endogeneity issues. The empirical model will be discussed in the next section.

#### 4.4.4 Endogenous Switching Regression Model (ESR)

Almost no evidence was found in earlier studies of the effect of access to microcredit on SME performance, particularly in Malaysia. In this study, we investigate the effect in Malaysia of access to microcredit on the performance of enterprises using cross sectional data collected through a survey questionnaire. To identify the causal effect of access to credit on SME performance, there are two potential econometric problems that arise. They are endogeneity and selection bias associated with the analysis of the impact of access to credit. The endogeneity problem arises in assessing the impact of credit using cross section data such as non-random allocation of credit, characteristics of the households and SMEs, and networking with credit officials. Since the microcredit provider has an opportunity to screen the applications from SMEs, it is likely that credit is distributed to the better-off enterprises, which are assumed to yield better performances. For example, SMEs that can access credit will be able to expand and generate higher profits, thereby promoting growth. Similarly, other SMEs have lower growth because of the difficulty of obtaining credit. Therefore, access to credit is endogenous. There is no empirical evidence that a study of the effect of microcredit on SME performance in Malaysia takes into account the endogeneity problem. Since panel data were available only for the outcome indicators and not available for other variables, the instrumental variable with fixed effect cannot be implemented. Therefore, this study employed the ESR model to address the endogeneity issues - to investigate how microcredit access affects SME performance; the choice of the ESR model is supported by Khalily & Khaleque (2013). They investigated the effect of access to credit on the productivity of enterprises in Bangladesh using ESR to overcome endogeneity issues.

There are two steps in the ESR model. The first is an access equation based on a dichotomous criterion function for the choice of SME access to microcredit or no access to microcredit specified as:

$$Y = 1 \text{ if } Y = \alpha Z_i + \varepsilon_i \geq 0 \quad (4.35)$$

$$Y = 0 \text{ otherwise}$$

Where Y is access to microcredit status, which equals 1 if the SME has access to microcredit and 0 otherwise. Z is a vector of owner-characteristics; household characteristics; SME characteristics and distance and networking;  $\varepsilon_i$  is the error term.

In this study, the logit model is applied to assess the determinants that influence microcredit. However, in the ESR model the binary probit model is used in the first step. In the second step, we estimate the coefficient for the effect of microcredit on SME performance by considering two regime equations for microcredit borrower and non-microcredit borrowers. The model is specified as:

$$\text{Regime 1: } Y_{iM} = X_i' \beta_{iM} + \varepsilon_{iM} \quad \text{if } D_i = 1 \quad \text{when SMEs access credit} \quad (4.36a)$$

$$\text{Regime 2: } Y_{iN} = X_i' \beta_{iN} + \varepsilon_{iN} \quad \text{if } D_i = 0 \quad \text{when SMEs do not access credit} \quad (4.36b)$$

Where  $Y_{iM}$  and  $Y_{iN}$  are outcomes such as sales growth and employment growth for microcredit borrowers and non-microcredit borrowers, respectively.  $X_i'$  is a set of exogenous variables that may influence the outcomes,  $\varepsilon_i$  is the random disturbance term associated with outcome variables.

Assume that  $\varepsilon_i$  (in equation 4.35),  $\varepsilon_{iM}$  and  $\varepsilon_{iN}$  have a normal distribution with a mean vector of zero and covariance matrix as follows (Lokshin & Sajaia, 2004):

$$\Sigma = \begin{pmatrix} \sigma_1^2 & \rho_{10} & \rho_{1\varepsilon} \\ \rho_{10} & \sigma_0^2 & \rho_{0\varepsilon} \\ \rho_{1\varepsilon} & \rho_{0\varepsilon} & 1 \end{pmatrix}$$

Where  $\sigma_1^2$  and  $\sigma_0^2$  are variances of error term in equations (4.36a) and (4.36b.)  $\rho_{1\varepsilon}$  and  $\rho_{0\varepsilon}$  are the correlation between access to microcredit in equation (4.35) and the impact of microcredit on the outcomes in equations (4.36a) and (4.36b);  $\rho_{10}$  is the correlation between equations (4.36a) and



(4.36b.) If  $\rho_{1\varepsilon} = \rho_{0\varepsilon} = 0$ , there is no existence of selection bias in the model. In contrast, if  $\rho_{0\varepsilon}$  or  $\rho_{1\varepsilon}$  is different from zero, selection bias is an issue (Lokshin & Sajaia, 2004)

The variables  $Z_i$  in equation (4.35) and  $X_i'$  are allowed to overlap; proper identification requires at least one variable in  $Z_i$  that does not appear in  $X_i'$ <sup>17</sup>. Therefore, the selection equation (4.35) is estimated based on all explanatory variables specified in the outcome equation plus one instrument.

The valid instrument is required to influence the accessibility of microcredit but have no effect on the outcomes. In this study, we chose distance as an identifying instrument since previous studies have shown that distance between borrower and creditor positively and significantly affects access to credit (Petersen & Rajan, 2002). However, distance is predicted not to affect SME performance. The probit and OLS regression will be estimated in outcome equations (sales and employment growth) separately to check for the validity of the instrument.

The variable  $X_i'$  in specifications (4.36a) and (4.36b), has to consider observable factors to address the issue of selection bias. Nevertheless, unobservable factors could still create a correlation between the error terms in the selection and outcome equations, i.e.,  $corr(\mu_i, \varepsilon_i) = 0$ . The ESR model addresses the selection bias issue resulting from unobservable factors. Specifically, after estimating the selection equation, the inverse Mills ratios  $\lambda_{iM}$  and  $\lambda_{iN}$  and the covariance terms  $\sigma_{\mu M} = COV(\mu_i, \varepsilon_{iN})$  are calculated and plugged into equations (4.36a) and (4.36b) and written as:

$$Y_{iM} = X_i' \beta_{iM} + \sigma_{\mu M} \lambda_{iM} + \gamma_{iM} \quad \text{if } D_i = 1 \quad (4.37a)$$

$$Y_{iN} = X_i' \beta_{iN} + \sigma_{\mu N} \lambda_{iN} + \gamma_{iN} \quad \text{if } D_i = 0 \quad (4.37b)$$

Where  $\lambda_{iM}$  and  $\lambda_{iN}$  control for selection bias resulting from unobservable characteristics; the error terms  $\gamma_{iM}$  and  $\gamma_{iN}$  have conditional zero means.

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<sup>17</sup> The variables  $X_i$  and  $Z_i$  are have similar variables; the only difference is that one instrumental variable (distance variable) is included in  $Z_i$  but not in  $X_i$ .

To determine whether the ESR model is appropriate, if  $\rho_{0\varepsilon}$  or  $\rho_{1\varepsilon}$  are significantly different from zero and the likelihood ratio test rejects the null hypothesis that exogenous is better than endogenous, then the ESR model addresses selection bias (Lokshin & Sajaia, 2004)

## 4.5 Data Sources and Data Description

### 4.5.1 Description of the Study Area

The target population is SMEs in Malaysia. The criteria to decide whether an enterprise is or is not an SME are based on the enterprise's sales turnover and number of employees. The study chose SMEs in Terengganu (East Coast of West Malaysia) as the sampling frame for the following reason. The study selects Terengganu as the study sample site because Terengganu exhibits a relatively higher incidence of poverty and is a less developed region among the states in Malaysia. The top two microcredit institutions (Amanah Ikhtiar Malaysia and TEKUN) operate in the state. In addition, there are many SMEs operating in Terengganu and it is relatively easy to obtain the data related to SMEs and microcredit. In 2017, there are 29, 324 SMEs in operating Terengganu (SME Corporation, 2017).

Since the questionnaire requires knowledge from respondents about their enterprise's accessibility to finance, we approached the financial manager or owner to complete the questionnaire.

Considering the limited budget, time and practical difficulties in obtaining the list of and information about the targeted population, the study uses convenience sampling to select the sampling units.

The results from the survey, therefore, cannot be interpreted beyond the sample (Zikmund, Babin, Carr, & Griffin, 2010).

### 4.5.2 Sample Size

The formula formulated by Cochran (2007) was used to determine the sample size. The formula is calculated as follows:

$$n = \frac{z^2 pq}{e^2} \quad (4.38)$$

Where:

n is sample size;

$z^2$  is the abscissa of the normal curve that cuts off an area at the tails;

e is the desired level of precision;

p is the estimated proportion of an attribute that is present in the population; and

q is 1-p.

This study uses a 95% (or  $\pm 5\%$  precision) level of confidence and assumes  $p = 0.5$ ,  $q = 0.5$ .

Based on the formula in equation (4.38), the desired sample size is 385. However, to avoid sample attrition, the sample size must be larger than the calculated sample responses required. In practice, the working sample size was 600 to obtain sufficient, completed responses for analysis; the actual sample used for the empirical analyses was 498 responses.

### **4.5.3 Survey Instruments**

A structured questionnaire was developed to obtain the data for analysis. The survey questionnaire was submitted to the Lincoln University Human Ethics Committee for approval concerning the confidentiality of data, especially because financial and accounting information of businesses is revealed. Before being distributed to the owner or manager of SMEs in Terengganu, the questionnaire was translated into Bahasa Malay to make it easier for respondents to comprehend the questions. The survey was administered from February to March 2016. A total of 600 questionnaires were administered to the SMEs, and 596 responses were received. Of the 596 responses, 98 SMEs were eliminated as unusable due to inadequate information. The overall response rate for this study was 83.6% (498 useable responses). The responses are divided into two categories namely microcredit borrowers consist of 386 respondents and non-borrowers consist of 112 respondents.

The survey questions are based on the literature and the objectives of the study. The structured questionnaire comprises the following sections and information:

- 1) Finance information of SME businesses
- 2) Microcredit borrowers
- 3) Non-borrowers
- 4) Characteristics of the SME
- 5) Characteristics of the owner/manager

The five sections of the structured questionnaire are as follows: 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 the SME owner’s characteristics, such as age, ethnicity, marital status, educational level, and experience. The survey questionnaire is included in the Appendix B.1.

## 4.6 Chapter Summary

Different econometric approaches have been discussed and the data specifications used to answer the research objectives of this study have been described. The first section illustrates the conceptual framework on accessibility to credit and the empirical model applied to determine the key factors influencing the SMEs’ accessibility to microcredit.

The SMEs choice of microcredit provider is evaluated using multinomial logit approach since there are three alternatives which are microfinance institutions, commercial banks and development financial banks. The microfinance institution is used as a base reference or reference against which the other choices are compared. The OLS were conducted to evaluate the determinants of the financing rate charged on microcredit.

In this study, SMEs’ performance is measured by sales and employment growth. To evaluate the impact of microcredit on SMEs’ performance, the propensity score matching method and the difference-in-difference method were used with the expectation that these approaches can mitigate the selection bias issue arising from observable and unobservable factors. Further, this study described the ESR model used to address the endogeneity issues.

This study used primary data collected through a structured questionnaire distributed to SMEs in Terengganu, Malaysia with the response rate of 83.6% (498 SMEs of which 386 are microcredit borrowers and 112 are non-borrowers).

## **Chapter 5**

### **Research Results and Findings**

Chapter 5 discusses the empirical results of the models investigating the factors that influence the accessibility of SMEs to microcredit, the factors in choosing microcredit providers and the impact of microcredit. The chapter is organised as follows. Section 5.1 profiles the respondents in terms of owner-manager and SME characteristics. Section 5.2 presents the microloan profile based on the survey data. Section 5.3 presents the non-borrower profile. Section 5.4 identifies the perceptions in choosing creditors among SMEs. Section 5.5 presents the results on microcredit accessibility. Section 5.6 discusses the factors in choosing a microcredit provider in Malaysia. Section 5.7 identifies the factors that affect the interest rate charged on a loan. Section 5.8 discusses the impact of microcredit on SME performance. Section 5.9 summarizes the findings of the study.

#### **5.1 Profile of the Respondents (Microcredit Borrowers and Non-Borrowers)**

A frequency distribution and descriptive statistics are used to evaluate the respondents who participated in the survey with respect to demographic background such as gender, age, marital status, educational level, and experience. This section discusses the characteristics of the surveyed respondents. The demographic profiles of the respondents are divided into microcredit borrowers and non-borrowers.

##### **5.1.1 Owner/Manager and Household Characteristics**

Using convenience sampling, 600 questionnaires were initially administered by the researcher to the respondents; a total of 596 responses were received. Of the 596 responses, 98 SMEs were eliminated because of unusable information. The overall response rate for this study was 83.6% (498 useable responses). This rate was high and adequate for further analysis. Table 5.1 shows the demographic variables of the sampled respondents. Chi-square was used to test the relationship between the microcredit borrowers and non-borrowers.

Table 5.1 shows 74.3 percent of the respondents (346) were males and 25.7 percent were females. Based on the Chi-Square test, there is no relationship between gender and being engaged in microcredit borrowing or non-borrowing. Most microcredit borrowers were men (285 respondents (73.8%) compared with 101 women (26.2%). Table 5.1 shows that 38.2% of the respondents were in the age group 36-45 years of age; relatively few were over 55 years of age (9.8%). When grouped

into the two different groups (borrower and non-borrower), a high proportion (40.7%) of the microcredit borrowers were in the 36-45 years of age category, whereas 41.1% of non-borrowers were aged from 46-55 years. The age of borrowers and non-borrowers is significantly different at the 1% level. With regard to the marital status, the overwhelming majority of both groups were married (92.4%) with 3.6% and 4.0% single or divorced, respectively.

The Chi-square test shows there is a significant difference in marital status between borrowers and non-borrowers ( $\chi^2 = 23.67$ ,  $N=498$ ). Malaysia is a multi-racial country with three main ethnic groups: Malay and indigenous people, Chinese, and Indians. Most borrowers and non-borrowers were Malay (76.3%). Ethnicity is significantly associated with classifying borrowers and non-borrowers. In terms of owner experience, most respondents (69.3%) possessed work or business experience before starting their business. The Chi-Square test shows that experience has no relationship with the respondents engaged in borrowing or non-borrowing activity.

Respondents were asked to specify their highest educational attainment. The surveyed respondents were divided into four groups with respect to educational attainment: those with primary school, secondary school, diploma education, and bachelor's degree education. Table 5.1 shows 47.0 percent of SME owners had secondary school education; 4.6% of SME owners completed only primary school. Approximately 47.4% of the microcredit borrowers had secondary school education. The proportion of microcredit borrowers with diploma education was higher than that of non-borrowers (39.9% versus 33.9%). There is a statistically significant difference in education level between the microcredit borrowers and non-borrowers at the 5% level.

The survey results also showed that households with more family members participated more in microcredit. Most microcredit and non-borrowers had four members living in their household. The survey results showed the largest group of microcredit borrowers had three income earners (31.6%) in their household, whereas the largest group of non-borrowers (33.0%) had four income earners.

Household annual income was divided into four levels: RM1000 to RM2000; RM2001 to RM3000; RM3001 to RM4000; and over RM4000. The sampled SMEs owners in Terengganu, Malaysia earned more than RM4,000 per month (70.5%). The household income of the microcredit group and non-microcredit group is comparable. This result is similar to that reported by Department of Statistics of Malaysia in the Household Income and Basic Amenities Survey 2014, with a mean income of RM4,816 for the state. The Chi-square test confirms the difference in household income is significant.

**Table 5.1 Profile of the Sampled Respondents**

		Non-microcredit borrowers (N <sub>1</sub> =112)		Microcredit borrowers (N <sub>2</sub> =386)		All Respondents (N <sub>3</sub> =498)		Statistical Test
		Count (n <sub>1</sub> )	% to N <sub>1</sub>	Count (n <sub>2</sub> )	% to N <sub>2</sub>	Sub-total (N <sub>4</sub> = n <sub>1</sub> + n <sub>2</sub> )	% to N <sub>4</sub>	
<b>Gender</b>	Female	27	24.1%	101	26.2%	128	25.7%	$\chi^2 = 0.193$
	Male	85	75.9%	285	73.8%	370	74.3%	
	Total	112	100.0%	386	100.0%	498	100.0%	
<b>Age</b>	Below 35 years	28	24.9%	43	11.1%	72	14.2%	$\chi^2 = 19.353^{***}$
	36-45 years	46	41.1%	142	36.8%	188	37.8%	
	46-55 years	33	29.5%	157	40.7%	190	38.2%	
	More than 55 years	5	4.5%	44	11.4%	49	9.8%	
	Total	112	100.0%	386	100.0%	498	100.00%	
<b>Marital Status</b>	Single	8	7.1%	10	2.6%	18	3.6%	$\chi^2 = 27.671^{***}$
	Married	91	81.3%	369	95.6%	460	92.4%	
	Divorce	13	11.6%	7	1.8%	22	4.0%	
	Total	112	100.0%	386	100.0%	498	100.0%	
<b>Ethnic</b>	Malays	74	66.1%	306	79.3%	380	76.3%	$\chi^2 = 9.648^{**}$
	Chinese	30	26.8%	63	16.3%	93	18.7%	
	Indian	8	7.1%	16	4.1%	24	4.8%	
	Kadazan	0	0.0%	1	0.3%	1	0.2%	
	Total	112	100.0%	386	100.0%	508	100.0%	
<b>Education Level</b>	Primary School	4	3.6%	19	4.9%	23	4.6%	$\chi^2 = 8.665^{**}$
	Secondary School	50	45.5%	183	47.4%	234	47.0%	
	Diploma	51	33.9%	154	39.9%	192	38.6%	
	Bachelor's Degree	38	17.0%	30	7.8%	49	9.8%	
	Total	112	100.0%	386	100.0%	468	100.0%	

\*, \*\*, \*\*\* indicate significance levels at 10%, 5%, 1%, respectively

**Table 5.1 Profile of the Sampled Respondents**

		Non-microcredit borrowers (N <sub>1</sub> =112)		Microcredit borrowers (N <sub>2</sub> =386)		All Respondents (N <sub>3</sub> =498)		Statistical Test
		Count (n <sub>1</sub> )	% to N <sub>1</sub>	Count (n <sub>2</sub> )	% to N <sub>2</sub>	Sub-total (N <sub>4</sub> = n <sub>1</sub> + n <sub>2</sub> )	% to N <sub>4</sub>	
<b>Experience before running business</b>	No	34	30.4%	119	30.8%	153	30.7%	$\chi^2 = 0.009$
	Yes	78	69.6%	267	69.2%	345	69.3%	
	Total	112	100.0%	386	100.0%	498	100.0%	
<b>Household Size</b>	2	10	8.9%	16	4.1%	26	5.2%	$\chi^2 = 9.545^{**}$
	3	19	17.0%	48	12.4%	67	13.5%	
	4	37	33.0%	109	28.2%	146	29.3%	
	5	22	19.6%	114	29.5%	136	27.3%	
	Over 5	24	21.4%	99	25.6%	123	24.7%	
	Total	112	100.0%	386	100.0%	498	100.0%	
<b>Income earner</b>	1	11	9.8%	23	6.0%	34	6.8%	$\chi^2 = 8.640^*$
	2	40	35.7%	105	27.2%	145	29.1%	
	3	34	30.4%	122	31.6%	156	31.3%	
	4	8	7.1%	58	15.0%	66	13.3%	
	Over 4	19	17.0%	78	20.2%	97	19.5%	
	Total	112	100.0%	386	100.0%	498	100.0%	
<b>Household income</b>	RM1000-RM2000	4	3.6%	17	4.4%	21	4.2%	$\chi^2 = 13.367^{***}$
	RM2001-RM3000	4	3.6%	40	10.4%	44	8.8%	
	RM3,001 - RM4,000	10	8.9%	72	18.7%	82	16.5%	
	Over RM4,000	94	83.9%	257	66.6%	351	70.5%	
	Total	112	100.0%	386	100.0%	498	100.0%	

\*, \*\*, \*\*\* indicate significance levels at 10%, 5%, 1%, respectively

Sources: Author's calculations based on the survey, 2016



### 5.1.2 Characteristics of SMEs

Table 5.2 shows the characteristics of SMEs by age of enterprise, types of ownership, sector, annual sales turnover and number of fulltime workers. Table 5.2 shows that the largest group of borrowers (35.1%) had been operating for 10 to 14 years; the largest group of non-borrowers had been in business for only 5 to 9 years. The oldest SMEs in the sample had been in business for over 20 years (6.6%). A further 146 (29.3%) of the sampled SMEs had been operating for 5 to 9 years. The Chi-square test confirms there is a significant difference in the age of the firm between the microcredit borrowers and non-borrowers at the 1% level.

Table 5.2 also shows 88.2% of the respondents were 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 firms are in the service sector (64.9%) followed by manufacturing (26.1%) and agriculture (9%). The mean annual sales in 2012 for most of the microcredit borrowers, as well as the non-microcredit borrowers is less than RM300,000 which means all sampled respondents are classified as microenterprises. Between 2012 and 2014, the mean annual sales for microcredit and non-microcredit borrowers increased. Table 5.2 shows there has been a drop in the mean number of employees from 6 to 5 persons.

**Table 5.2 Characteristics of the Sampled SMEs**

		Non-microcredit borrowers (N <sub>1</sub> =122)		Microcredit borrowers (N <sub>2</sub> =386)		All Respondents (N <sub>3</sub> =508)		Statistical Test
		Count (n <sub>1</sub> )	% to N <sub>1</sub>	Count (n <sub>2</sub> )	% to N <sub>2</sub>	Sub-total (N <sub>4</sub> =n <sub>1</sub> +n <sub>2</sub> )	% to N <sub>4</sub>	
<b>Age of firm</b>	Less than 5 years	36	32.1%	35	9.1%	71	14.3%	$\chi^2 = 73.066^{***}$
	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%	
	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%	
<b>Types of Ownership</b>	Household business establishment	6	5.4%	9	2.3%	15	3.0%	$\chi^2 = 4.654$
	Sole proprietorship	98	87.5%	341	88.3%	439	88.2%	
	Collective/Co-operative	2	1.8%	3	0.8%	5	1.0%	
	Limited liability company	6	5.4%	33	8.5%	39	7.8%	
	Total	112	100.0%	386	100.0%	498	100.0%	
	<b>Sector</b>	Manufacturing	28	25.0%	102	26.4%	130	
Service		78	69.6%	245	63.5%	323	64.9%	
Agriculture		6	5.4%	39	10.1%	45	9.0%	
Total		112	100.0%	386	100.0%	498	100.0%	
<b>Annual sales in 2012</b>	N	112		398		498		$t = -0.545$
	Mean	101664.82		105675.53		102566.83		
	Standard Deviation	71199.815		67821.587		70406.907		
<b>Annual sales in 2014</b>	N	112		386		498		$t = 2.364^{**}$
	Mean	128803.57		150185.81		145376.95		
	Standard Deviation	81749.958		92430.958		90502.174		
<b>No. full time workers 2012</b>	N	112		386		498		$t = 2.445$
	Mean	5.39		6.10		6.17		
	Standard Deviation	2.56222		3.04659		3.158		
<b>No. full time workers 2014</b>	N	112		386		498		$t = 2.393$
	Mean	5.82		6.54		5.78		
	Standard Deviation	2.852		3.317		2.843		

\*, \*\*, \*\*\* indicate significance levels at 10%, 5%, 1%, respectively

Sources: Author's calculations based on the survey, 2016

## 5.2 Profile of Microcredit Loans

In 2006, Bank Negara Malaysia selected 10 financial institutions including commercial banks to offer microcredit to SMEs. Therefore, commercial banks are also an option (33.2% of the institutions) from which SMEs can borrow microloans. Table 5.3 shows that SMEs also choose to borrow from development financial institutions (32.6%) such as Bank Rakyat and Agro Bank. The results also show 34.2% of the sampled respondents used microfinance institutions such as AIM and TEKUN. SMEs choose these regular financial institutions for microcredit loans (30.6%) and as microcredit providers because they offer the best credit terms and conditions such as repayment period and interest rate (24.4%).

The survey results also show that most borrowers borrowed over RM25, 000 (91.2%) per single time. The objectives in obtaining microcredit loans by the SMEs are to purchase equipment, machines or tools (46.0%), improve the business site (42.2%) and employ more workers (11.8%). Almost half of the SMEs businesses are between 5 and 10 km (44.0%) from the closest microcredit provider and 8.3% are over 20 km away from the microcredit provider (see Table 5.3).

The results show that the top reasons the borrowers chose microcredit were minimal documentation (19.6%) followed by fast processing time (19.3%) and easy access (18.2%). The loan processing time for microcredit is expected to be quick and fast. It is somewhat surprising that most respondents reported microcredit applications take a month to process (53.6%) and only a few borrowers (1.3%) were granted microcredit in less than a week. Table 5.3 also shows that about half of the borrowers received long term microcredit (53.6%). Finally, for the microcredit most borrowers pay the loan interest every month (95.6%), 3.4% paid weekly.

**Table 5.3 Profile of Microcredit Loans**

		Microcredit borrower (N=386)	
		Total	%
<b>Types of institutions</b>	Microcredit institutions	132	34.2%
	Commercial bank	128	33.2%
	Development financial institutions	126	32.6%
	Total	386	100.0%
<b>Reason for choosing selected microcredit provider</b>	Regular financial institution for microcredit loan	270	30.6%
	The only microcredit supplier in the area	39	4.4%
	Other credit suppliers would reject the application	179	20.3%
	Microcredit supplier offer lowest interest rate	179	20.3%
	Microcredit supplier offers the best credit terms and condition	215	24.4%
	Total	882	100.0%
<b>Single microcredit amount</b>	Between RM5,001 and RM10,000	25	6.5%
	Between RM10,001 and RM15,000	3	0.8%
	Between RM15,001 and RM20,000	5	1.3%
	Between RM20,000 and RM25,000	21	5.4%
	More than RM25,000	332	86.0%
Total	386	100.0%	
<b>Loan purpose</b>	Improve business site	330	42.2%
	Buy equipment, machines or tools	360	46.0%
	Employ more workers	92	11.8%
	Total	782	100.0%
<b>Distance</b>	Less than 5 km	58	15.0%
	Between 5 km and 10 km	170	44.0%
	Between 10 km and 20 km	126	32.6%
	More than 20 km	32	8.3%
	Total	386	100.0%

**Table 5.3 Profile of Microcredit Loans (continued)**

		Microcredit borrower (N=386)	
		Total	%
<b>Reason for choosing microcredit scheme</b>	No collateral	50	3.6%
	Low interest rate	182	13.0%
	Fast processing time	270	19.3%
	Fast disbursement	220	15.8%
	Minimal documentation	273	19.6%
	Easy access	254	18.2%
	Not eligible for higher amount	41	2.9%
	Processing cost is less expensive	106	7.6%
	Total	1396	100.0%
<b>Loan processing time</b>	Less than a week	5	1.3%
	One week	6	1.6%
	Two weeks	14	3.6%
	Three weeks	43	11.1%
	A month	207	53.6%
	More than a month	111	28.8%
	Total	386	100.0%
<b>Duration of loan</b>	Short term (<1 year)	36	9.3%
	Medium term (1-5 years)	143	37.1%
	Long term (> 5years)	207	53.6%
	Total	386	100.0%
<b>Mode of interest payment</b>	Daily	1	0.3%
	Weekly	13	3.4%
	Monthly	369	95.6%
	Quarterly	3	0.8%
	Semi-annual	386	100.0%

Note: Column 3 presents the total responses but does not tally with the number of respondents because of multiple answers.

Sources: Author's calculations based on the survey, 2016

### 5.3 Profile of Non-Borrowers

Of the 498 surveyed respondents, 112 are non-microcredit borrowers. The non-microcredit borrower respondents were asked to indicate the reasons they did not borrow. Multiple reasons have been identified for not borrowing. Table 5.4 presents the key reasons for SMEs not applying for the microcredit. The results show 96 of the respondents said they did not qualify for financing (22.7%) (See Table 5.4). Other possible reasons include SMEs not asking for a loan because of the characteristics of the loan, such as too many required documents to submit (16.1%). Microcredit providers require applicants to provide operational proof such as business licences, bank statements as proof of income, and utilities bills, when applying for loan applications. This reason may reduce the intention to borrow. This finding is consistent with that of Harvie et al's (2010) who found that complex documents prevent SMEs from borrowing because the process of document preparation is not an easy task and is time consuming. In Malaysia, SMEs generally face difficulties in obtaining finance because they have insufficient documents and business records to support their loan application (Haron, Said, Jayaraman, & Ismail, 2013).

**Table 5.4 Reasons for not Borrowing Microcredit**

Reasons	Non-borrower respondents	
	Total	%
Do not qualify for financing	96	22.7%
Do not like to be in debt	7	1.7%
Received financial assistance from the government	20	4.7%
Loan processing time too long	45	10.7%
Too many required documents to submit	68	16.1%
Insufficient knowledge of financial product availability	55	13.0%
Lack of collateral	50	11.8%
Interest rate was not affordable	31	7.3%
Have enough funding	48	11.4%
Other	2	0.5%
Total	422	100.0%

Note: Total responses do not tally with the number of respondents because of multiple answers.  
Sources: Author's calculations based on the survey, 2016

Loan processing time being too long (10.7%), interest rate not affordable (7.3%) and insufficient knowledge of financial product availability (13.0%) are other reasons SMEs do not borrow from

microcredit institutions. Some of the non-borrowing SMES do not have a credit demand because they have enough funding for their business (11.4%). Another reason (0.5%) identified by the non-microcredit borrowers is the inconsistency in the sales of their business and therefore they were afraid to take a loan that could become a burden if they were unable to repay it. This finding is similar to the assumption of Rosenberg (2010) that if credit made them worse off, they would not have borrowed in the first place.

The non-borrowers were also asked if they intended to borrow in the future. Table 5.5 shows 93 of 112 respondents want to borrow in the future; only 19 people do not want to borrow in the future. A possible reason why these respondents might be discouraged to borrow in the future is the fear of rejection (Ghimire & Abo, 2013). SMEs ration themselves out of the credit market for reasons such as 1) unable to provide good marketable collateral; 2) low repayment capacity arising from their poor wealth position, such as low or unstable income and have little or no cash savings; and 3) fear of the risk involved in loan repayment. Cheng (2006) discovered people who think they are unable to pay back the microloans typically have a low demand for microcredit.

**Table 5.5 Intention to Borrow by Non-Borrowers**

	<b>Non-microcredit borrowers</b>		
	<b>YES</b>	<b>93</b>	<b>83.0%</b>
Intention to borrow in the future	<b>NO</b>	<b>19</b>	<b>17.0%</b>
<b>TOTAL</b>		<b>112</b>	<b>100%</b>

Sources: Author’s calculations based on the survey, 2016

## 5.4 Perceptions in Choosing Credit Providers

Respondents were asked to provide their comments about choosing credit providers. This is explained using descriptive analysis. The five-point Likert scales in the survey questionnaire range from “strong disagree (1) to “strongly agree” (5) and required respondents to rate their level of agreement with statements. The results summarized in Table 5.6 give all the mean scores of the items, which range from 4.26 to 4.54 with the standard deviations from 0.574 to 0.922.

The category ‘No collateral required’ exhibits the highest level of agreement with a mean score of 4.54. Tsukada, Higashikata, and Takahashi's (2010) study points out that collateral is a critical credit factor in making credit decisions. The authors discovered the probability of obtaining small loans increases if the loans do not require a collateral. In addition, respondents agreed that the choice of

credit providers relies on credit attributes such as better lending terms (4.53), a less complicated lending procedure (4.48), immediate loan processing (4.46) and lower interest rate (4.38). For example, Nkundabanyanga, Kasozi, Nalukenge, and Tauringana (2014) concluded that favourable lending terms have a positive, significant effect on the demand for credit by SMEs. If the interest rate is perceived to be unfair or the rationale is not understood, enterprises will not apply for credit (Hagan et al., 2012; Stiglitz & Weiss, 1981).

The respondents also rated 'having a borrower relationship with the creditor' (mean 4.26) also plays an important role in choosing creditors. Having a good relationship with creditors might provide information about the credit needs. Bougheas et al. (2006) and Nguyen and Luu (2013) suggested that it is easy for firms to access credit based on the relationships between the creditors and firms since the network is the main determinant that helps firms to be less financially constrained.

**Table 5.6 A Summary of the Opinions of All Respondents about Choosing Credit Providers**

<b>Factors in choosing credit</b>	<b>Frequency (N=498)</b>	<b>Percent (%)</b>	<b>Mean</b>	<b>S.D</b>	<b>Factors in choosing creditors</b>	<b>Frequency (N=498)</b>	<b>Percent (%)</b>	<b>Mean</b>	<b>S.D</b>
<b>No collateral required</b>					<b>Having a borrowing relationship with the creditor</b>				
Strongly disagree	11	2.2	4.54	0.769	Strongly disagree	21	4.2	4.26	0.922
Disagree	0	0			Disagree	6	1.2		
Neutral	19	3.8			Neutral	20	4.0		
Agree	145	29.1			Agree	229	46.0		
Strongly agree	323	64.9			Strongly agree	222	44.6		
<b>Lower interest-rate</b>					<b>No/less complicated lending procedure</b>				
Strongly disagree	13	2.6	4.38	0.794	Strongly disagree	0	0	4.48	0.575
Disagree	0	0			Disagree	0	0		
Neutral	20	4.0			Neutral	20	4.0		
Agree	216	43.4			Agree	217	43.6		
Strongly agree	249	50.0			Strongly agree	261	52.4		
<b>Immediate loan release/faster processing</b>					<b>Better lending terms</b>				
Strongly disagree	1	0.2	4.46	0.574	Strongly disagree	0	0	4.53	0.560
Disagree	0	0			Disagree	0	0		
Neutral	14	14			Neutral	16	3.2		
Agree	236	47.4			Agree	200	4.2		
Strongly agree	247	49.6			Strongly agree	282	56.6		

Sources: Author's calculations based on the survey, 2016



## 5.5 Accessibility to Microcredit

A logistic regression (equation 4.12) with a maximum likelihood technique is employed to examine factors that influence SMEs' accessibility to microcredit. The dependent variable is the decision of the enterprise to borrow and is interpreted as accessibility to microcredit, which has a value of 1 if the enterprise borrowed microcredit and 0 otherwise. Table 5.7 presents the estimates of the logit model. Overall, 498 observations were used to calculate the estimated coefficients. The likelihood ratio test, with the Chi-square statistic equal to 138.73, fails to accept the null hypothesis that the parameter estimates for the model are equal to zero. Overall, the model fits the data well with 81.73% of correct predictions. Thus, the coefficients of the explanatory variables can be used to explain the probability of accessing microcredit by SMEs. The Breusch-Pagan and Cook-Weisberg test (see Appendix A.1) shows the presence of the heteroscedasticity in the model. To correct for the heteroscedasticity problem, standard errors are computed through White-correction (also known as robust standard errors).

The last column in Table 5.7 presents the marginal effects for the regressors of the logit model because it has been claimed that the estimated logit coefficients have no direct interpretation since they are just values that maximize the likelihood function. Therefore, to address this limitation, discussion of results will report the marginal effects to illustrate the direct effect of the explanatory variables on the dependent variables. For example, the positive sign for marginal effects increases the probability of SMEs accessing microcredit, whereas the negative sign of marginal effect reduces the probability of SMEs accessing credit.

Based on the estimated results in Table 5.7, ten variables have a significant influence on SMEs' access to microcredit. The factors that significantly affect the accessibility to microcredit by SMEs are: *married, ethnicity, received financial training, household income, age of enterprise, ownership, and networking with non-governmental organizations (NGOs), MFIs, business associations and distance.*

For owner-manager characteristics, Table 5.7 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. That married people are more involved in microfinance than the unmarried was also found by Beisland and Mersland (2012). The marginal effect of the married coefficient in Table 5.7 implies that being married increases the owner/manager's probability of accessing microcredit by 16.1 percent. This contrasts with Atta's (2012) finding that marital status does not influence access to credit. However, our finding is

consistent with Sebopetji and Belete (2009) who show that being married has a significantly positive influence on access to credit in South Africa. This relationship is reasonably explained in our study because it is expected that married men and women have family to accommodate, therefore they perform better and are more responsible in managing their business than single people because of family commitments and family responsibilities. One possible reason is that microloan providers may view married persons as more likely to have a stable income and financial position.

To capture the ethnicity of the owner-manager, this study uses a dummy variable which is equal to 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 in explaining access to microcredit. Table 5.7 shows Malay-owned enterprises have a greater likelihood of accessing microcredit by 7.4 percent than other ethnicity-owned firms. This result is consistent with Akoten et al.'s (2006) study which reports that the majority ethnic group conveniently seeks finance compared with the minority ethnic group. This is supported by Bruder et al. (2011) that German residents who possess foreign citizenship or who were born outside Germany, are more likely to be denied credit, or to be granted smaller loans than requested, than are native entrepreneurs. Indeed, the Malaysian government was explicit in its intention to boost Malay participation in the entrepreneurial activities which are dominated by other ethnicities (Hamidon, 2008). Therefore, many microcredit programmes have been designed to provide credit facilities to Malays. This situation is supported by Meza (2015) that both Perbadanan Usahawan Nasional Berhad (PUNB) and TEKUN Nasional exclusively maintain financing for Bumiputeras,<sup>18</sup> thus reducing the possibility of access by other ethnic groups which thus perceive the process of accessing credit as difficult.

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<sup>18</sup> Bumiputera is an ethnic group in Malaysia who are native Malays, who practise Malay customs and indigenous ethnic groups from Sabah and Sarawak who are protected by the country's constitution (Ismail et al., 2015)

**Table 5.7 Logit Analysis Results of SMEs' Accessibility to Microcredit**

Independent Variables <sup>1</sup>	Coefficient	Robust Standard Error	P-value	Marginal Effects
No. of Observations	498			
Log Likelihood	-187.697			
Chi2 (22)	138.73			
Pseudo R <sup>2</sup>	0.2929			
Percent of correctly predicted	81.73			
Accessibility to microcredit				
Constant	-2.502	1.288	0.052*	
<b>Owner/Manager Characteristics</b>				
Gender	0.229	0.321	0.475	0.027
Age <sup>(2)</sup>	0.195	0.449	0.663	0.023
Age <sup>(3)</sup>	-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
<b>Household Characteristics</b>				
Household size <sup>(2)</sup>	0.101	0.395	0.798	0.012
Household size <sup>(3)</sup>	0.133	0.432	0.759	0.016
Income earner <sup>(2)</sup>	-0.132	0.371	0.722	-0.016
Income earner <sup>(3)</sup>	0.214	0.397	0.589	0.026
Household income	-0.596	0.226	0.008***	-0.071
<b>SMEs' Characteristics</b>				
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
<b>Networking</b>				
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

Note: 1. The dependent variable=1 if SME accessed microcredit and zero otherwise.

2. A dummy variable in each group is dropped to avoid the dummy trap problem.

3. \*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

4. Age, education level, household size, household income variables have been recoded<sup>19</sup>

Source: Author's calculations based on survey data

<sup>19</sup> Recoding is a technique that allows to combine or group two or more categories of variable in order to simplify the process of analysis (Bryman & Cramer, 1997). The age, education, household size and household income groups are formed by combining and collapsing and recoding the categories of the variable.

This study also found that SME owners who received financial management training significantly positively influences access to microcredit at the 1% level, indicating that these SME owners have an 11.2 percent higher probability of accessing microcredit than those who do not have such training (see Table 5.7). The reason is that training might reflect financial literacy. 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). Besides, the 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 there is improved access to credit. Fatoki and Asah (2011) suggest that training in credit management can help SME owners to get investment ready and thus improve access to finance. For instance, financial training might be sufficient to help SMEs with the knowledge of finance and 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.

Under the household characteristics, there are no statistically significant results for household size and number of income earners. Holding other factors constant, Table 5.7 shows a significantly negative sign on the Household Income variable indicating that SMEs' accessibility to microcredit increases with decreased household income. For every decrease in household income, the probability of accessing microcredit increases by 7.1 percent. Households with a higher income may be less budget constrained and therefore are less likely to borrow microcredit. This finding exhibits important evidence in the microfinance literature because microcredit targets low income people, thus it would be expected that households with low incomes are more likely to access microcredit than those with high incomes. This inverse relationship finding is consistent with Mohamed (2003) for Zanzibar and Saqib, Kuwornu, Panezia, and Ali (2017) for Pakistan. Mohamed (2003) examined the relationship between household income and access to formal and quasi-formal credit but found a negative effect on credit access. Saqib et al. (2017) observed 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 gives increased credibility to the result in this study. In addition, most microcredit programmes in Malaysia exhibit eligibility criteria favouring enterprises with low household income. Microcredit targets the poor and helps the poor to set up small businesses to increase their income and lift them out of poverty.

For enterprise characteristics, age of enterprise exhibits a positive, significant effect at the 1% level on the probability of SMEs in Malaysia accessing microcredit. For every increase in an SME's age, the

probability of accessing microcredit increases by 1.7 percent because older firms have more experience in applying for loans (see Table 5.7). This result is similar to that in a study by Peprah and Ayayi (2016) who found that as the age of an enterprise increases the probability of accessing microcredit increases. Mature enterprises benefit more from credit because the age of an enterprise can be a proxy in determining the sustainability of the business and its repayment capability. This argument is supported by Gemechu and Reilly (2011) who argued that the estimated positive effects from the age of a firm increases the probability of obtaining a loan from banks or microfinance institutions. Winker (1996) indicated that the age of a firm may reduce the probability of credit being rationed. We can conclude that young enterprises face difficulties in accessing microcredit. Access to microcredit does not appear to be affected by the size of the enterprise, as captured by the number of employees. Similarly, there is no systematic relationship between the sector in which the enterprise operates and its access to credit.

The ownership structure shows unexpected results. Sole proprietorship exhibits a positive significant correlation with access to microcredit. Table 5.7 shows that an enterprise registered as a sole proprietorship increases the probability of access to microcredit by 14.7 percent, which is statistically significant at the 1% level. Micro and small enterprises in Malaysia (81.55%) are dominated by sole proprietors (Department of Statistics Malaysia, 2011). Microcredit programmes in Malaysia generally target micro and small enterprises because they are more likely to have greater credit demands for working capital and investment in their businesses. Besides, 88.2% of respondents in this study are sole proprietors, which may affect our result. This finding supports Sampong (2011) who found that people in Ghana who access microcredit are sole proprietors. Conversely, Kira and He (2012) found sole proprietors face difficulties accessing finance because a sole proprietorship business is a high risk borrower because repayment of the loan depends on one person. This finding exhibits the evidence that microcredit helps to serve the credit needs of SMEs.

The results show that networking between social organizations or NGOs, microfinance institutions (MFIs) and business associations has a positive significant effect on microcredit accessibility but not with formal commercial banks. The result implies that the probability of accessing microcredit increases by 1.7 percent for SMEs that network with NGOs. NGOs occupy a niche as a financial intermediary in Malaysia. Networking with social organizations or NGOs may be viewed as a key advantage for SMEs in accessing microcredit because SMEs can gain access to credit more cheaply through networking with social organizations or NGOs (Hamidon, 2008). The marginal effect of networking with MFIs shows that the probability of accessing microcredit increases by 3.9 percent (see Table 5.7) because the SMEs possibly receive better information on microcredit facilities offered

by microfinance institutions so access to microcredit is easier because of their good relationships with MFIs. Atieno (2001) concludes that having an established network with credit institutions improves lending terms and conditions in favour of small-scale enterprises, which provides an important opportunity to facilitate to access credit. This finding supports other studies' findings that the closer the relationship between the lender or supplier, the less difficulty there is in obtaining finance (Saleh & Ndubisi, 2006; Nguyen and Ramachandran, 2006). Table 5.7 shows 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 percent. Other members in business associations also help to promote access to financial services (Atieno, 2009). This is because membership of business associations involves information sharing. This finding is consistent with that of Gemechu and Reilly (2011) that access to credit improves when an enterprise in Ethiopia networks among business associations more than for enterprises that have no relationship with business associations.

The distance variable, not surprisingly, also is a strong determinant in accessing microcredit; it is significant at the 1% level (see Table 5.7). 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 so therefore can develop social capital with them and, consequently have easy access to microcredit. In addition, it is well documented that distance is always associated with high transaction costs (Garikipati, 2012; Ibrahim & Bauer, 2013; Li et al., 2011a).

## 5.6 Factors Influencing the Choice of Microcredit Providers by SMEs in Malaysia

There are three distinct categories of microcredit providers namely: microfinance institutions, commercial banks and development financial institutions. SME Owners/managers were asked to indicate their choice of microcredit provider, i.e., borrowing from an MFI, commercial bank or development financial institution. To the best of our knowledge, this study is the first to examine enterprises' microcredit provider choices in Malaysia.

The explanatory variables were tested for multicollinearity before estimating the multinomial logit model (equation 4.8). Multicollinearity exists when the explanatory variables in multiple regression models are highly associated and provide irrelevant information about the response (Verbeek, 2008). The existence of multicollinearity in the model may cause large t-values, large variances, and ambiguous results. We use the Variance Inflation Factor (VIF) to detect multicollinearity. A common rule of thumb is that if VIF is 10 or greater it indicates multicollinearity. Appendix A.1 shows our result is free from multicollinearity. In addition, before analysing the estimated results, we checked for heteroscedasticity. The Breusch-Pagan and Cook-Weisberg test concludes there is no existence of heteroscedasticity in the model (see Appendix A.1).

Table 5.8 shows the results of the MNL for SMEs. Columns (1) and (2) show the likelihood of choosing either commercial banks or development financial institutions relative to MFIs. The dependent variable (MFI) is used as a reference cell or base category. The coefficients in the MNL model (equation (4.23)) are difficult to interpret (Maitra and Ray, 2000). Hence, the probability of  $Y = j$  in relation to the base category  $Y = 0$  is expressed by the Relative Risk Ratio (RRR)<sup>20</sup>.

Owner/manager characteristics such as gender, age, marital and ethnicity are less important factors in determining microcredit providers. However, the different lending characteristics of microcredit providers play a part in influencing microcredit demand among borrowers. This study includes loan characteristics such as loan amount, distance of business premises to microcredit provider, loan processing, loan duration and mode of interest payment to investigate factors that influence the choice of microcredit provider.

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<sup>20</sup> RRR can be defined as a unit change in the corresponding variable that will decrease or increase the likelihood of choosing an outcome relative to the base outcome.

**Table 5.8 Multinomial Logit Estimates for SMEs' Choice of Microcredit Providers in Malaysia**

<b>No. of Observations</b>	<b>386</b>					
<b>Log Likelihood</b>	<b>-350.190</b>					
<b>Chi2(36)</b>	<b>145.170</b>					
<b>Pseudo R2</b>	<b>0.172</b>					
	<b>(1)</b>			<b>(2)</b>		
<b>Variables</b>	<b>Commercial Banks vs Microfinance Institutions</b>			<b>Development Financial Banks vs Microfinance Institutions</b>		
	<b>Coefficient</b>	<b>RRR</b>	<b>SE</b>	<b>Coefficient</b>	<b>RRR</b>	<b>SE</b>
<b>Owner/Manager Characteristics</b>						
Gender	0.526	1.692	0.341	0.246	1.279	0.356
Age <sup>(2)</sup>	-0.492	0.611	0.438	-0.254	0.776	0.523
Age <sup>(3)</sup>	-0.342	0.710	0.529	0.440	1.552	0.612
Marital Status	0.333	1.395	0.545	0.038	1.038	0.609
Ethnic	-0.265	0.767	0.330	0.060	1.062	0.380
<b>SMEs Characteristics</b>						
Age of enterprise	0.061*	1.063	0.034	0.022	1.023	0.038
Ownership	0.697	2.008	0.478	0.512	1.668	0.478
Manufacturing	-0.327	0.721	0.513	0.724	2.062	0.612
Service	0.069	1.071	0.477	1.119**	3.063	0.583
Sized of enterprise	-0.064	0.938	0.051	-0.020	0.980	0.052
<b>Loan Characteristics</b>						
Size of loan	1.135***	0.321	0.429	-0.558	0.572	0.503
Loan process	-0.055	0.946	0.358	-0.561	0.571	0.429
Short term	-0.310	0.733	0.403	0.026	1.026	0.492
Long term	1.180***	3.255	0.354	2.640***	4.013	0.370
Monthly paid	2.429***	11.352	0.854	1.330	3.782	0.761
<b>Networking</b>						
Commercial Bank	0.006	1.006	0.095	0.005	1.005	0.100
MFI	-0.056	0.945	0.080	0.124	1.132	0.088
Distance in kilometres	-0.026*	0.975	0.015	-0.029*	0.971	0.017

Note: 1) Estimates are presented in the Relative Risk Ratio (RRR).

2) \*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

Source: Author's calculations based on survey data



SMEs that are mature in terms of the age of enterprise are more likely to borrow from commercial banks than microfinance institutions, even though commercial banks offered microcredit schemes similar to other microfinance institutions. But according to the SME Corporation Malaysia (2014) as business grow and mature in the market. SMEs can avail themselves of financing from commercial banks. Indeed, commercial banks are likely to finance SMEs that have a track record and collateral. For SMEs which have a higher risk profile, they may be able to mitigate the risk.

When comparing DFIs and MFIs, SMEs in the service sector prefer to choose the former over the latter. In terms of sector variables, the results suggest that firms in the services sector borrow 3.06 times more actively from DFIs than from MFIs. The reason is that some DFIs engage in service projects. For example, a Special Tourism Fund introduced by the SME bank provides financial assistance to the service sector. This leads to more opportunities for SMEs in the service sector to borrow from DFIs. The results are logical in the sense that DFIs have a competitive advantage over MFIs such as recognisability by people and a good infrastructure.

SMEs that require a large amount of credit (more than RM25, 000) are more likely to borrow from commercial banks over MFIs. The maximum amount of financing for commercial banks is RM50, 000 but the maximum for MFIs is less than RM25, 000. For example, a microcredit programme such as I-Wibawa and I-Sejahtera<sup>21</sup> limits the maximum financing to RM10, 000. Besides, the loan amount might be too large for the borrowers to borrow from MFIs (Dalberg, 2011).

It is apparent from Table 5.8 that the choice between commercial banks and MFIs is significantly influenced by the loan duration. A SME that wants to borrow for a long term is more likely to borrow from commercial banks or DFIs rather than MFIs. The Relative Risk Ratio (RRR) shows that holding other variables constant, if SMEs require a long duration it increases the probability of borrowing from a commercial bank by 3.26 times and 4.01 times for DFIs. This indicates that commercial banks and DFIs are common or popular microcredit providers for long term borrowing. From the lender perspective, the capital base of MFIs is still very small compared with commercial banks and DFIs. This is a major reason MFIs are unable to grant long term credit to SMEs.

In terms of mode of interest payment, the results show that the mode of interest payment is a statistically significant factor influencing the choice between commercial and MFIs. Some MFIs such as AIM and Yayasan Usaha Maju (YUM) require borrowers to pay weekly interest payments according to the specified period and rates (Abd Rahman, Ahmad, & Wahid, 2008). A weekly

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<sup>21</sup>I-Wibawa and I-Sejahtera are microcredit programmes available under Amanah Ikhtiar Malaysia.

payment may create financial stress for borrowers so therefore microcredit schemes provided by commercial banks may be a substitute for the SMEs instead of borrowing from MFIs. Field, Pande, Papp, and Park (2012) observed the weekly repayment period across microfinance borrowers and find frequent repayment creates a stress; less frequent repayment allows borrowers to use their credit more wisely and take advantage of profitable investment opportunities that result in higher household income.

This study attempts to test whether the distance to a microcredit provider from the business premises influences the choice of choosing a microcredit provider. The negative, significant at the 10% level coefficient of distance indicates that, as distance increases, SMEs are less likely to borrow from commercial banks and DFIs than from microfinance institutions. This means that an increase in distance reduces the probability of choosing commercial banks by 8 percent. Most commercial banks limit their operations to urban cities but MFIs such as Amanah Ikhtiar Malaysia are located and available in rural provinces. Distance affects the choice of a credit provider because of the high costs of borrowing that arise from transport expenses (Khan & Rabbani, 2015) and time opportunity cost (Li et al., 2011a). Boucher et al. (2009) and Winter-Nelson and Temu (2005) agree that distance to market or lender increases transaction costs for households. SMEs need to make loan repayments to the lender every month thus it is essential the lender is close to the SMEs.

In conclusion, this study provides insightful information on the determinants of SMEs' choice of microcredit provider. It is to noted, however, that the simplicity of our framework excludes some important credit characteristics from the analysis. Future researchers may include other credit attributes such as interest rate, guarantor or collateral as well as the type of loan and whether it is group or individual lending.

## 5.7 Factors that affect interest rate charged on microcredit

In investigating the factors that affect the interest rate charged on microcredit, the respondents were asked what were the lowest and highest rates that they received in 2014. A regression analysis was then conducted on 386 microcredit borrowers. Table 5.9 presents the two results of OLS estimates for the factors that affect the interest rate charged on microcredit. The model is free from multicollinearity, but heteroscedasticity exists. Therefore, the standard error is presented in robust standard error to solve that problem.

Table 5.9 shows two different models using different dependent variables but the same sets of independent variables. Models 1 and 2 use the lowest and highest interest rates, respectively. Both are continuous variables. The dependent variable interest rate charged on microloans is hypothesized to be influenced by six sets of variables: owner characteristics, SME characteristics, loan characteristics, choice of microcredit provider, networking, and creditworthiness. However, based on the results in Table 5.9, the interest rate charged on microcredit loans can be explained by SME characteristics, loan characteristics, networking and creditworthiness. For both models, owner characteristics show inconclusive evidence regarding effect on interest rate charged.

The age of the enterprise has a negative coefficient which indicates an inverse relationship between the age of the enterprise and the interest rate charged. This implies that increase in the age of the enterprise leads to a decrease in interest rate because the lender may view mature SMEs as established enterprises. Furthermore, the lender may be prepared to finance riskier borrowers if they can subsequently offset the higher default rate by applying higher interest rates to young SMEs.

Surprisingly, short duration is negatively related to a higher interest rate. A negative relationship between short duration and interest rate charged in Model 1 specifies that short term loans tend to have lower interest rates than medium term ones. The estimated coefficient indicates that the interest rate charged by a lender for a short term loan is 0.42 percent lower than for a medium term. This finding is similar to those of Diabate (2000) and Rose and Hudgins (2005) who found that a higher interest rate is charged for longer loan duration because of the increase in the lender's risk of the borrower defaulting from the loan because of income interruption. Lenders observed that SMEs choosing to borrow for short times are less risky because they are confident and committed to repaying the loan. *Ceteris paribus*, the shorter the loan duration, the lower the risk which leads the lender to offer a lower interest rate. However, this variable is insignificant in Model 2.

**Table 5.9 Estimated results of the Determinants of the Interest Rate Charged on Microloans**

Independent Variables	Lowest interest rate		Highest interest rate	
	Model (1)		Model (2)	
	Coefficient	Robust HC3 Standard Error	Coefficient	Robust HC3 Standard Error
Constant	5.358	0.705	14.183	0.728
<b>Owner/Manager Characteristics</b>				
Gender	0.143	0.154	0.197	0.227
Age <sub>(2)</sub>	0.006	0.194	0.123	0.311
Age <sub>(3)</sub>	0.119	0.223	0.294	0.366
Married	0.030	0.208	-0.314	0.277
Education	-0.090	0.118	0.006	0.184
<b>SMEs' Characteristics</b>				
Age of Enterprise	-0.024	0.013*	-0.026	0.022
Manufacturing sector	0.031	0.244	0.026	0.351
Service sector	0.108	0.237	0.237	0.319
Size of Enterprise	-0.008	0.017	-0.002	0.037
<b>Loan characteristics</b>				
Short term	-0.417	0.240*	-0.377	0.284
Long term	0.171	0.142	0.216	0.176
Loan amount	0.364	0.211*	0.925	0.343***
Monthly paid	0.631	0.439	0.393	0.535
<b>Microcredit provider</b>				
Commercial Bank	-0.157	0.165	0.138	0.197
MFI	-0.107	0.134	-0.230	0.244
<b>Networking</b>				
Commercial bank	-0.038	0.047	-0.108	0.065*
MFIs	0.060	0.045	-0.037	0.058
<b>Creditworthiness</b>				
Accounting book	-0.782	0.115***	-1.011	0.171***
<b>No. of observations</b>	386		386	
<b>R-squared</b>	0.204		0.206	

\*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively

Robust Standard error applied HC3 options by STATA to correct heteroscedasticity problem

Source: Author's calculation based on survey data

Loan amount is positively associated with the interest rate charged on a microloan; this is significant at the 10% and 1% levels for Models 1 and 2, respectively. If the loan amount is over RM25, 000, the lender tends to charge a higher interest rate. A larger loan implies higher risk for the lender because of borrowers' higher probability of default so the lender charges a higher interest rate for a bigger loan. Normally microcredit is offered at a low amount to low income people. Therefore, the interest rate increases for those who borrow over RM25, 000.

Interestingly in Model 2, by networking with a commercial bank an SME receives a lower interest rate. This result is statistically significant at the 10% level. Nguyen & Ramachandran (2006) and Rand (2007) found that firms with a previous borrowing relationship with a bank can borrow at a lower interest rate and have a higher probability to obtain another loan. Since the lender has inadequate information about a borrower's risk profile, higher average interest rates are charged to all borrowers regardless of their risk profile (de Aghion & Morduch, 2006). Networking can help lenders to obtain information about the borrower so consequently the interest rate imposed is not as high.

As hypothesized, the explanatory variable accounting books is statistically significant at the 1% level for both models. Relative to those not having accounting books, SMEs with them experience lower interest rates than those who do not. The estimated coefficient for accounting books is - 0.782 and -1.011 for Models 1 and 2, respectively. This indicates that the interest rate charged decreases by 0.78% and 1.011% if SMEs have accounting books that display the business transactions to the lender. The availability of financial statements can help the lender to assess the borrower's risk level because financial transactions provide evidence of the financial transparency in practice (Lee & Sohn, 2017) and show the behaviour of the SME in managing money.

In summary, a lender may charge a lower interest rate if SMEs have been established for many years, borrow for a short term with a small loan amount, network with a commercial bank and have accounting books. The risk is associated with the price of microcredit.

## **5.8 Impact of Microcredit on SMEs' Performance**

### **5.8.1 Data for Impact Evaluation**

The data used to examine the impact of microcredit on SMEs' performance were collected in Terengganu, Malaysia. The microfinance programme and SMEs are related to each other because small entrepreneurs are the major participants in the microfinance programme. The survey particularly targeted micro and small enterprises because they are considered to have more access to microcredit than medium sized enterprises. Microcredit in Malaysia has been designed by the

Central Bank of Malaysia (Bank Negara Malaysia) for individuals with low income to undertake self-employment. The purpose of this impact assessment is to compare the outcomes for microcredit borrowers – the treated group – with the control group – the non-borrowers.

The choice of variables is somewhat restricted by data availability. Most sampled respondents do not have a good track record in keeping good financial records. Therefore, only growth in sales and employment are used in this study to measure SMEs’ performance.

In this section, the results for the impact of microcredit on SMEs’ performance will be evaluated using PSM and DID methods. As mentioned in the previous chapter, PSM tries to obtain a matched sample by balancing the treatment and control groups on observed covariates. With this approach, we presume to solve selection bias issues before comparing the outcomes from microcredit participation for factual and counterfactual (Oh et al., 2009). As a robustness check, two different types of matching estimators are adopted in this study, kernel matching (with a default bandwidth of 0.06) and radius matching (with a default radius of 0.1). In radius matching the idea is to use all the control units (non-borrowers) within the caliper. Kernel matching is used where all treated are matched with a weighted average of all controls with weights that are inversely proportional to the distance between the propensity scores of the treated and control groups (Setboonsarng & Parpiev, 2013). However, because of its drawbacks, PSM failed to control selection bias that arises from unobserved factors; DID is employed to mitigate that bias.

**Table 5.10 Descriptive Statistics of the Outcome Variables Sales and Employment Growth in 2014**

Variables	Microcredit borrowers		Non-microcredit borrowers		Difference (1)-(2)	T-statistics
	(1)		(2)			
	Mean	S.D	Mean	S.D		
<b>Outcome variables</b>						
Sales growth	0.320	0.329	0.053	0.294	0.267	7.732***
Employment growth	0.036	0.196	0.023	0.178	0.013	0.605
Number of observations	386		112			

\*, \*\*, and \*\*\* indicate significance levels at 10%, 5%, and 1%, respectively.

Source: Author’s calculations based on survey data

Table 5.10 compares the means of sales and employment of SMEs for 2014. The sales growth of the treatment group is higher than that of the control group and is significantly different at the 1% level

between the two groups. The employment growth of microcredit borrowers is slightly higher than non-microcredit borrowers, but the difference is statistically insignificant.

## 5.8.2 Estimation Strategies

The coefficient of the average impact of the treatment microcredit  $\delta_{PSM}^{ATT}$  is obtained using the PSM method based on the following specification (Dehejia & Wahba, 2002):

$$\delta_{PSM}^{ATT} = E(Y_1 | X, D = 1) - E_X[E(Y_0 | X, D = 0) | D = 1] \quad (5.1)$$

Where Y is the outcome of interest, i.e., sales growth and employment growth; D is a treatment indicator equal to 1 if the SME belongs to a treated group and 0 otherwise; and X is a covariate of the observed characteristics. The selection of covariates includes owner characteristics (gender, age, married, ethnicity and financial training), household characteristics (number of income earners) and enterprise characteristics (age of enterprise, ownership, and sector).

Two choices must be considered for propensity score estimation. The first concerns the model to be used for the estimation and the second is the variables to be included in the model. This study uses the logit model, where we estimate the probability of participation of a microcredit borrower versus non-participation. Next is the selection of covariates. Rubin and Thomas (1996) recommended including relevant variables in the propensity score estimation. The covariates in our model include GENDER, AGE<sub>(2)</sub>, AGE<sub>(3)</sub>, MARRIED, ETHNICITY, FINANCIAL TRAINING, INCOME EARNER<sub>(2)</sub>, INCOME EARNER<sub>(3)</sub>, AGE OF ENTERPRISE, OWNERSHIP, MANUFACTURING, SERVICE, SIZE OF ENTERPRISE and NETWORKING.

The selection of covariates to control for individual heterogeneity follows the rule that the variable should simultaneously influence programme participation and the outcome (Caliendo & Kopeinig, 2008). Therefore, our covariates include the variables that are significant in determining microcredit participation from the previous analysis. Even though the previous analysis shows household income has a significant effect on the participation in microcredit, the variable is excluded when estimating the propensity score. According to Caliendo and Kopeinig (2008), variables included in the model should not be influenced by anticipation of participation. For example, household income increases or decreases because of participation in microcredit. Therefore, household income is excluded in estimating the propensity score.

Networking with commercial banks and MFIs cannot be included because the common support condition as stated in assumption 2 (*Common support or overlap*) in Chapter 4 failed and matches cannot be performed. To meet assumption 2, other variables such as gender, age, income earner and sector are included. According to Heckman et al. (1997), to guarantee that SMEs with similar characteristics can be observed in both groups some randomness is needed. The main purpose of the propensity score estimation is not to predict selection into a treatment but to balance all covariates (Augurzky & Schmidt, 2001). Therefore, the goal is to obtain estimates of the propensity score that statistically balance the covariates between the treated and control groups.

Once the model is chosen and the covariates selected, estimation of the propensity score is done using a logistic regression. Table 5.11 presents the estimated results of the logit models for the propensity score. Among the explanatory variables determining the propensity of participation in microcredit, 'married' and 'age of enterprise' are significant at the 1% level.' Ethnicity' and 'financial management training' are positive and significant at the 5% level.

**Table 5.11 Logit Results for the Propensity Score Estimation**

<b>Variable</b>	<b>Coefficient</b>	<b>Standard error</b>
Constant	-2.227	0.834
Gender	-0.078	0.279
Age <sup>(2)</sup>	-0.138	0.352
Age <sup>(3)</sup>	-0.425	0.456
Married	1.127***	0.394
Ethnicity	0.608**	0.275
Financial management training	0.440**	0.254
Income Earner <sup>(2)</sup>	-0.118	0.307
Income Earner <sup>(3)</sup>	-0.027	0.341
Age of Enterprise	0.179***	0.032
Ownership	0.570	0.377
Manufacturing sector	-0.286	0.533
Service sector	-0.098	0.509
Number of observations	498	
Log Likelihood	-225.303	
LR Chi2	80.300	
P value	0.000	
Pseudo R-squared	0.151	

\*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

Source: Author's calculations based on survey data



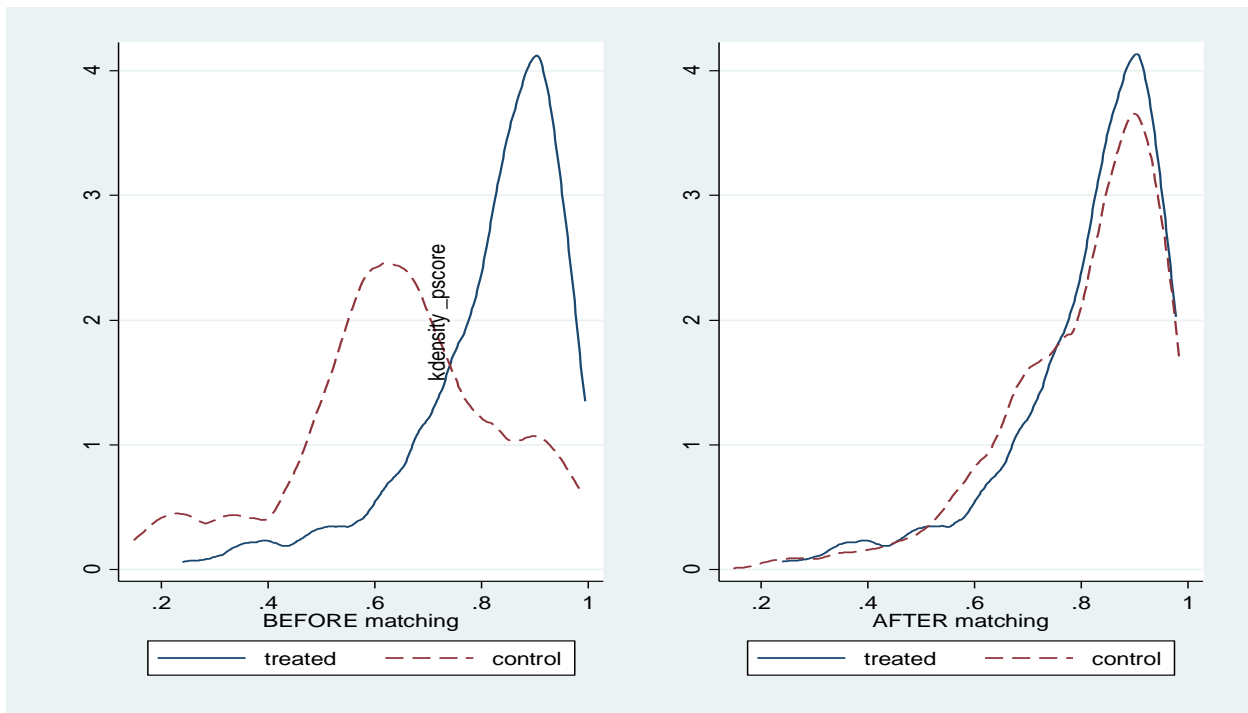
The PSM creates a new data set that consists of the borrower and non-borrower groups that are comparable in terms of the observed characteristics in the original data. The comparison between microcredit borrowers and non-borrowers is now performed over a common support region with similar characteristics. Table 5.12 presents the number of enterprises that fall off and out of common support. Of the 498 enterprises, only one is outside the common support and is excluded from the analysis. This indicates that the treatment and control groups are similar in terms of observable characteristics, which increases the likelihood of being matched. This study used the remaining 497 enterprises (385 treated and 112 controls) in the models. The unmatched comparison unit is discarded and is not used to estimate the treatment impact.

**Table 5.12 Analysis of Common Support among the Respondents**

Treatment assignment	Common Support		
	Off Support	On Support	Total
Untreated	0	112	112
Treated	1	385	386
Total	34	497	498

Source: Author's calculations based on survey data

The propensity score distribution estimates of all SMEs resulted in one observation being dropped from the matching procedure since it lay outside the overlap region. Six blocks are estimated to be within the common support region in which the balancing property is confirmed for each block and all individuals within the range [0.24, 0.996] are kept in the model. Thus, 385 borrowers are matched with 112 non-borrowers. The balancing property was tested in all blocks and the means of the treated and control groups show no significant difference. The PSM estimator satisfies the confoundedness and overlap conditions with the balancing property satisfied and six blocks estimated and is thus bias free.



**Figure 5.1 The Distributions of Propensity Scores Before and After Matching**

The propensity distributions of the propensity score before and after are shown in Figure 5.1. Before the match, the propensity score is more diverse but after the matching it is more concentrated, and its distribution is similar between the treatment and control groups.

If the difference between the matched control and treatment is statistically significant, it is claimed that there is systematic difference in terms of observable characteristics between the two groups. Consequently, PSM cannot be performed. Good balancing criteria include: 1) the standardized bias (% bias) should be less than 5% after matching, and 2) the t-test should not be significant. For each covariate we ran this test, in which the null hypothesis states that the means of a covariate in the control and treated groups are similar or equal. This study accepts the null hypothesis which means the two groups are similar and well balanced for all covariates.

Table 5.12 shows the covariate balancing test derived from kernel matching. To avoid repetition, only covariate balancing using kernel matching is included. The output of covariate balancing for radius matching can be found in Appendix A.2; it meets the quality matching. Table 5.12 shows all covariates are well balanced using kernel matching, thus matching quality for each covariate individually is not an issue. Of the 13 covariates, five are not balanced before matching but all covariates are balanced after matching. The standardized bias after matching is less than 5%. Overall, the matching performance for this study is good. Thus, PSM succeeds in balancing the covariates.

**Table 5.13 Covariate Balancing: Mean Differences Before and After Matching by Kernel Matching**

Variable	Unmatched Matched	Mean		%reduct		t-test	
		Treated	Control	%bias	bias	t	p> t
Gender	Unmatched	0.738	0.759	-4.7		-0.44	0.661
	Matched	0.738	0.735	0.6	88.2	0.08	0.939
Age2	Unmatched	0.368	0.411	-8.8		-0.82	0.411
	Matched	0.369	0.346	4.7	46	0.67	0.504
Age3	Unmatched	0.521	0.339	37.2		3.42	0.001
	Matched	0.519	0.514	1.1	97	0.15	0.878
Married	Unmatched	0.956	0.813	45.8		5.16	0.000
	Matched	0.956	0.957	-0.3	99.4	-0.06	0.956
Ethnicity	Unmatched	0.793	0.661	29.9		2.91	0.004
	Matched	0.792	0.792	-0.1	99.8	-0.01	0.993
Financial management training	Unmatched	0.744	0.616	27.5		2.64	0.008
	Matched	0.743	0.756	-2.9	89.4	-0.43	0.665
Income earner <sup>(2)</sup>	Unmatched	0.316	0.304	2.7		0.25	0.802
	Matched	0.317	0.310	1.5	42.6	0.21	0.830
Income earner <sup>(3)</sup>	Unmatched	0.352	0.241	24.5		2.22	0.027
	Matched	0.351	0.343	1.7	93.3	0.22	0.827
Age of enterprise	Unmatched	11.640	7.304	82.3		7.68	0.000
	Matched	11.582	11.634	-1	98.8	-0.13	0.894
Ownership of enterprise	Unmatched	0.883	0.875	2.6		0.24	0.809
	Matched	0.883	0.896	-3.9	-50.6	-0.56	0.575
Manufacturing sector	Unmatched	0.264	0.250	3.3		0.3	0.763
	Matched	0.262	0.309	-10.7	-228.4	-1.44	0.151
Service sector	Unmatched	0.635	0.696	-13.1		-1.2	0.229
	Matched	0.636	0.633	0.7	95	0.09	0.929

Note: 1) All computations are performed using the “pstest” function available on STATA.

2) \*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

Source: Author’s calculations based on survey data

### 5.8.3 Results and Discussion

#### *Impact of Microcredit on Sales Growth*

The estimates of the average treatment effect of microcredit participation on the treated (ATT) are summarised in Table 5.14 using kernel and radius matching. Using two different matching algorithms avoids any shortcomings that might result if we relied on just one method. It also helps to check the robustness of the estimated impact (Ghalib et al., 2014).

The first column in Table 5.14 specifies the outcome variables and the second column reports the number of treated and control groups used in the matching process. The last three columns display the ATT for sales growth by kernel and radius matching, the standard errors and the t-statistics. ATT

is the difference between the expected outcome values with and without treatment for SMEs that participated in the treatment. The results from radius and kernel matching are similar.

The findings from PSM analysis show a positive, significant impact of microcredit on sales growth. The sales growth effect is significant at the 1% level. The parameter estimates show that an enterprise borrowing from a microcredit provider experienced 25.6% to 25.7% higher sales growth over 2014 than non-microcredit borrowers. This comparison is based on matching 385 microcredit borrowers with 112 non-microcredit borrowers. It is clear that the treated group members improved their sales more than the control group.

**Table 5.14 Average Treatment Effect (ATT) on SMEs' Sales Growth Using Radius and Kernel Matching**

		Radius Matching		
Variable	$N_t/N_c$	ATT	S. E	T-stat
	385/112	0.256	0.044	5.78***
Log of sales growth		Kernel Matching		
	$N_t/N_c$	ATT	S. E	T-stat
	385/112	0.257	0.047	5.47***

$N_t$  = number of treated,  $N_c$  = number of controls.

\*, \*\*, and \*\*\* indicate significance levels at 10%, 5%, and 1%, respectively.

Source: Author's calculation based on survey data

The existence of a direct relationship between microcredit and enterprise sales was documented in the study by Sebstad and Walsh (1991) who noted a positive impact of microcredit on enterprise sales. Similarly, a recent study by Pephrah and Ayayi (2016), who employed PSM, specified that client businesses with microfinance in Ghana performed better in terms of sales than non-client businesses. They concluded that microfinance has some benefits for clients. Our result is similar to that of Ouma and Rambo (2013) who measured the impact of microcredit on women-owned SMEs before and after they received microcredit. The authors found SMEs in Kenya experienced higher growth after access to microcredit than before.

With improvement in sales growth, enterprises are in a favourable position to improve their business profits and accumulate capital resources for reinvestment. Sustained investment in working capital is required for the growth and expansion of enterprises. Therefore, microcredit is likely to have a positive influence on the growth of SMEs in terms of sales.

### ***Impact of Microcredit on Employment Growth***

Estimates of the microcredit impact on employment growth are presented in Table 5.15. This study finds no strong evidence that microcredit supports employment growth. The result shows that the effect of microcredit on employment growth is insignificant regardless of which matching approach is used. The insignificant impact estimator of employment growth is because microcredit clients are trapped in self-employment as they are continually involved in survival activity. Microfinance clients do not create jobs for others; they create work for themselves, i.e., self-employment. Bauchet and Morduch (2013) conducted a study of SMEs' finance and microcredit in Bangladesh and found that SMEs provide employment on a much larger scale than microenterprises supported by microcredit. Mosley and Hulme (1998) also concluded that microloans have a very limited impact on employment.

**Table 5.15 The Average Treatment Effect on SMEs' Employment Growth Using Radius and Kernel Matching**

Variable	Radius Matching			
	$N_t/N_c$	ATT	S. E	T-stat
	385/112	-0.030	0.027	-1.11
Log of Employment Growth	Kernel Matching			
	$N_t/N_c$	ATT	S. E	T-stat
	385/112	-0.034	0.028	-1.21

$N_t$  = number of treated,  $N_c$  = number of controls.

\*, \*\*, and \*\*\* indicate significance levels at 10%, 5%, and 1%, respectively.

Source: Author's calculations based on survey data

Another possible reason for insignificant employment growth is that SMEs often employed a few people, such as friends or relatives, as workers. Rooyen et al. (2012) reported no evidence of increased employment creation. Our study contrasts with that by Gubert and Roubaud's (2011) which found that the impact of microcredit on employment was positive and significant in 2001, but it was not statistically significant when the authors measured the impact in 2004. In terms of the two types of PSM, we can conclude that we do not find any significant relationship between the access to microcredit and employment growth.

Though PSM is a useful tool to control for bias due to observed factors in impact evaluation, unobserved characteristics or time effects cannot be controlled for by cross-sectional data, which highlights a shortcoming of PSM. Therefore, as suggested by Caliendo and Kopeinig (2008), methods controlling for unobserved bias such as DID using panel data are recommended if data are available.

Even though the results of the impact of microcredit on sales and employment growth are in line with previous research, the use of panel data could help produce much more credible analysis than that based on cross-sectional research. Therefore, given the availability of a panel dataset to control for unobserved bias, estimating the effect of microcredit programmes using DID is discussed in the next section.

#### **5.8.4 Impact Evaluation of Using Difference in Differences**

As suggested by Heckman et al. (1997), a combination of PSM with DID is strongly expected to improve impact evaluation. If the panel data are available, a method that controls for unobserved bias such as DID is recommended. Therefore, this study employs DID to correct for possible bias due to differences in time-invariant unobserved characteristics between the participant and control groups in evaluating the impact of microcredit on sales and employment growth. The comparison is based on matching 385 microcredit borrowers and 112 non-microcredit borrowers derived from PSM. PSM makes the standard DID assumption more plausible by forming a matched data set before employing the DID estimator.

Table 5.16 shows the SMEs' performance measured by sales and employment growth. The sales growth for microcredit borrowers greatly improved between 2012 and 2014 (column D1). The average sales growth for microcredit borrowers rose by 21.0 percent over two years, which is statistically significant at the 1% level [p-value  $\Pr(T > t) = 0.0000$ ]. However, the significant improvement in the microcredit borrower group could be a combination of the time influence and the impact of the microcredit programme. To discover the true programme impact on microcredit borrowing enterprises, the potential time trend must be controlled. The average outcome changes for non-microcredit borrowers between 2012 and 2014 are used to approximate the time trend suffered by the microcredit borrower group (column 6). In column D2, Table 5.16, shows non-microcredit borrowers experienced decreased sales growth of 7.7 percent from 2012 to 2014; the result is statistically significant at the 5% level.

After differencing the means between the two groups (microcredit and non-microcredit borrowers), this study finds that microcredit borrowers show a significant positive impact on sales growth. After eliminating possible bias due to the unobservable time-invariant, the magnitude of the impact of microcredit on sales growth is much higher than before controlling for bias. According to the DID estimate, the sales growth of microcredit borrowers increased by 28.7% percent more than that of non-microcredit borrowers who shared identical characteristics derived from the PSM method. The results are statistically significant at the 1% level (see column 7, Table 5.16). This finding is similar to

Cortez's (2012) result where the sales of microenterprises in Peru increased when they access microfinance compared with the control group who did not access microfinance.

**Table 5.16 The Standard DID Estimates of Microcredit Impact on Sales and Employment Growth**

	Microcredit Borrowers			Non-Microcredit Borrowers			DD
	Year	Year	Difference	Year	Year	Difference	estimator
	2012	2014	(D <sub>1</sub> )	2012	2014	(D <sub>2</sub> )	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>Outcome</b>			<b>D1 =</b>			<b>D2 =</b>	
<b>Variables</b>	<b>Ymb<sub>12</sub></b>	<b>Ymb<sub>14</sub></b>	<b>Ymb<sub>14</sub> – Ymb<sub>12</sub></b>	<b>Ynmb<sub>12</sub></b>	<b>Ynmb<sub>14</sub></b>	<b>Ynmb<sub>14</sub> – Ynmb<sub>12</sub></b>	<b>DD = D1 – D2</b>
<b>Log of sales growth</b>	0.109 (0.014)	0.319 (0.017)	0.210*** (0.026)	0.130 (0.017)	0.053 (0.028)	-0.077** (0.034)	0.287*** (0.052)
<b>Log of employment growth</b>	0.033 (0.011)	0.035 (0.010)	0.002 (0.018)	0.034 (0.014)	0.023 (0.017)	-0.011 (0.024)	0.013 (0.036)

Note: Entries represent means of log of sales growth for the microcredit borrower (mb) group and non-microcredit borrower (nmb) group.

Numbers in parentheses are standard errors.

\*, \*\*, \*\*\* represent the 10%, 5%, 1% significance levels for the *t*-test, respectively.

Source: Author's calculations based on survey data

The positive impact of microcredit on employment growth is not statistically significant (column 7, Table 5.16). Although our findings do not confirm a significant impact of microcredit on employment growth, the result is positive for employment growth after mitigating bias because of the time invariant. Based on the result in Table 5.16, employment growth of the microcredit borrowing group slightly increased by 3.4% between 2012 and 2014. However, there is little evidence for a positive microcredit impact on employment growth.

### 5.8.5 Causal Effect of Access to Microcredit on SMEs' Performance using Endogenous Switching Regression

This section discusses what factors explain the SMEs' performance indicators such as sales growth and employment growth. In reality, access to credit is endogenous. Therefore, endogeneity is controlled by applying the endogenous switching regression (ESR) model with instrument variable. The ESR model is appropriate to estimate the impact of a binary endogenous treatment variable on a continuous outcome variable. The ESR model enables us to understand the factors that influence sales and employment growth for microcredit and non-microcredit borrowers separately.

Before employing ESR with the instrument variable, the preliminary task is to find an instrument variable that influences the participation variable but is not correlated with the outcome indicators. To test the validity of distance as an instrument, this study employs the probit model on the access to microcredit and OLS for the outcome equations with the inclusion of the instrument variable as a regressor. The results (see Appendix A.5) show that distance influences access to microcredit but has no effect on sales and employment growth suggesting the validity of the instrument.

The results obtained from the first stage of the probit model are presented in Appendix A.7. The estimated parameters and the statistical significance of the explanatory variables from the probit model are similar to the results obtained from the logit model in the Section 5.5. The result on the impact of access to microcredit on SMEs' performance will be discussed in the next section.

### ***The Impact of Access to Microcredit on Sales Growth***

The impact of access to microcredit on sales growth was measured using the estimates presented in Table 5.17. The variable financial training shows a differential impact on sales growth for microcredit and non-borrowers. The significant, positive impact of financial training on sales growth for microcredit borrowers shows that financial training plays an effective role in contributing to microcredit borrowers' greater improvements in sales growth. This finding is consistent with that of Bruhn and Zia (2013) who studied the impact of a business and financial training programme on entrepreneurs in Bosnia Herzegovina. The authors found that although financial training did not increase business survival it led to improvements in business performance and sales. In contrast, the negative, significant effect of financial training on non-borrowers indicates that financial training negatively affects sales growth. Other studies suggest that the provision of training does not have a positive impact on business performance. Karlan and Valdivia (2011) found that training of women micro entrepreneurs in Peru improves book record keeping but not sales.

The sales growth of microcredit borrowers is determined by household size but that has no effect on non-borrowers. A household that has 4 people (*Household size*<sub>(2)</sub>) and 5 people or more (*Household size*<sub>(3)</sub>) exhibits a greater positive, significant effect on sales growth than household size of less than 3 people. This finding indicates a larger household leads to increased sales growth. To some extent, large households might reduce savings and increase expenses, therefore there is an advantage in promoting higher sales growth. This result is consistent with Adekunle (2011); larger households usually have higher expenditure and expenses and thus, more responsibilities and they work harder to succeed in the business, which is reflected in increased sales to cater for the needs of their household.



The size of the enterprise shows a significantly (at the 1% level) positive impact on sales growth for both microcredit borrowers and non-borrowers, suggesting that size of enterprise is a vital determinant of sales growth (see Table 5.17). The size of a firm is represented by the number of workers in the enterprise. Bigger enterprises have 16 and 102 percent higher sales growth for microcredit borrowers and non-borrowers, respectively. This is because the growing number of workers in the workforce helps productivity and leads to an increase in sales growth. A study by Wijewardena and Cooray (1995) on the sales growth of small Japanese firms found large firms in the small scale sector demonstrated greater sales growth.

The coefficient of ownership is positive and significant at the 5% level for microcredit borrowers but insignificant for non-borrowers (see Table 5.17). The result suggests that sole proprietorship has a positive impact on SMEs' sales growth. SMEs set up as sole proprietorships (in this case microcredit borrowers) tend to increase their sales growth by 5.3 percent. This could be due to an easy business structure since the owners have direct control of their business finances. However, this result contradicts Shibia and Barako's (2017) finding that joint ownership positively affects MSE growth more than sole proprietorship. The positive effects of joint ownership could be because of resource pull advantages such as managerial resources, division of labour and continuity of the enterprise.

Table 5.17 shows a positive, significant relationship at the 1% level between networking with microfinance institutions and sales growth for microcredit borrowers. The result reveals that network ties between the SMEs and MFI officials' increase sales growth by 3.3 percent. The relationship with MFIs may have exposed SMEs to different ideas and broader sources of information, which could be useful when making decisions about future directions for their business so increasing sales growth (Birley, 1985; Cope et al., 2007; Ramos-Rodriguez et al., 2010). In addition, through networking SME owners can obtain the knowledge to remain competitive.

This study also tests whether there are gender differences in the factors that affect the sales growth. Gender has no impact on sales growth for microcredit borrowers, but it does influence sales growth for non-borrowers. There is evidence that the gender of the entrepreneur plays an important role in the performance of SMEs (Ali & Shabir, 2017). In terms of sales growth, the evidence suggests that a male-owned enterprise is likely to experience greater increased sales than a female-owned one. A male-owned enterprise contributes to the sales growth of the enterprise because of cultural orientation that the male is the breadwinner and the person to make decisions for the family.

**Table 5.17 The Impact of Access to Microcredit on Sales Growth using the ESR Model**

Variables	Sales Growth			
	Microcredit borrowers		Non-borrowers	
	Coefficient	S.E	Coefficient	S.E
Constant	-0.320	0.165	-0.247	0.242
<i>Owner/Manager Characteristics</i>				
Gender	0.046	0.039	0.146	0.068**
Age <sup>(2)</sup>	0.038	0.061	-0.013	0.071
Age <sup>(3)</sup>	0.033	0.073	-0.028	0.095
Married	0.136	0.083	-0.023	0.078
Ethnicity	0.010	0.043	0.005	0.069
Education	-0.010	0.033	0.006	0.058
Financial training	0.084	0.038**	-0.152	0.075**
Experience	0.042	0.040	0.086	0.061
<i>Household Characteristics</i>				
Household size <sup>(2)</sup>	0.120	0.054**	0.042	0.076
Household size <sup>(3)</sup>	0.099	0.059**	-0.025	0.085
Income earner <sup>(2)</sup>	0.001	0.047	-0.016	0.080
Income earner <sup>(3)</sup>	0.058	0.053	-0.008	0.089
Household income	0.011	0.020	0.026	0.043
<i>SMEs' Characteristics</i>				
Age of enterprise	-0.001	0.004	-0.006	0.007
Manufacturing sector	-0.022	0.061	0.010	0.124
Service sector	0.002	0.058	0.065	0.116
Size of enterprise	0.016	0.006***	0.050	0.012***
Ownership	0.119	0.053**	-0.069	0.093
<i>Networking</i>				
Commercial bank	0.009	0.012	-0.005	0.021
NGOs	-0.002	0.008	-0.022	0.014
MFI	0.033	0.011***	-0.006	0.021
Business associations	-0.023	0.017	-0.030	0.022
logsigma1	-1.172	0.040	0.000	
logsigma2	-1.340	0.100	0.000	
$\sigma_1$	0.310	0.012		
$\sigma_2$	0.262	0.026		
$\rho_1$	0.369	0.138***		
$\rho_2$	-0.402	0.262		
Log likelihood	-275.720			
LR test of indep. eqns	4.840			
Number of observations	498			
Wald test	69.870			

\*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

Source: Author's calculations based on survey data

The impact of the access to microcredit on sales growth of SMEs can be captured by the coefficients of the significant variables such as gender, financial training, household size, size of the enterprise, ownership and networking with MFIs, but the correlations  $\rho_1$  and  $\rho_2$  give the summary of microcredit access effects on SMEs. Since  $\rho_1$  is positive and significant at the 1% level, it is plausible to state that having access to microcredit helps SMEs grow more in terms of sales than non-borrowers. The negative sign of  $\rho_2$  suggests that the non-borrowers experience limited growth in their sales, but the coefficient is insignificant. This result is in conformity with the results obtained from PSM and DD and highlights the importance of microcredit for SMEs' performance. The  $\sigma_1$  and  $\sigma_2$  are significantly different from zero therefore the endogenous switching method is valid.

### **The Impact of Access to Microcredit on Employment Growth**

Employment growth is another key indicator in measuring the performance of SMEs. Table 5.18 presents the impact of access to microcredit on employment growth. The relationship between financial training is complex; there is a positive impact between financial training and sales growth for microcredit borrowers, but a negative, significant effect on the non-borrowers' group. The study by Akoten et al. (2006) shows that training is not significant in determining employment growth.

There is a relationship between the size of the enterprise effect and employment growth that is positive and significant at the 1% level for both borrowers and non-borrowers. Interestingly, the employment growth of microcredit borrowers is slightly higher than that of their counterparts. Employment growth for microcredit borrowers and non-borrowers rises by 0.9 percent and 0.8 percent, respectively, as the size of the enterprise increases (see Table 5.18). However, Banerjee and Jesenko's (2015) study shows a negative relationship between firm size and net employment growth, which means employment growth is higher for smaller firms in Slovenia.

An assessment was made of how networking relates to SMEs' performance. Surprisingly, for non-borrowers, networking with a commercial bank is negative and significant at the 1% level (see Table 5.18). This implies that networking with a commercial bank decreases SMEs' employment growth. Apparently, SMEs are not fully utilizing networking with the commercial banks.

This finding contradicts Schoonjans, Van Cauwenberge and Vander Bauwhede's (2013) study that found networking showed a positive relationship with the employment growth, but the finding was insignificant. The negative sign of  $\rho_2$  suggests that employment growth decreases if the respondent belongs to the non-borrower group but the result is insignificant hence, this study failed to provide evidence on the impact of access to microcredit on employment growth. This could be because of the short period (two years) of the study being not enough to determine the impact of employment

growth. Additionally, SMEs may face difficulties in attracting qualified workers which impedes employment growth.

**Table 5.18 The Impact of Access to Credit on Employment Growth using the ESR Model**

Variables	Employment Growth			
	Microcredit borrowers		Non-borrowers	
	Coefficient	Standard error	Coefficient	Standard Error
Constant	0.105	-0.278	-0.278	0.162
<i>Owner/Manager Characteristics</i>				
Gender	0.004	0.024	0.047	0.046
Age <sup>(2)</sup>	-0.005	0.038	-0.009	0.048
Age <sup>(3)</sup>	-0.022	0.045	0.068	0.064
Married	0.000	0.052	0.032	0.053
Ethnicity	0.022	0.027	-0.026	0.045
Education	0.009	0.021	0.045	0.038
Received financial training	0.000	0.023	-0.117	0.047**
Experience	0.012	0.025	0.017	0.042
<i>Household Characteristics</i>				
Household size <sup>(2)</sup>	-0.019	0.034	-0.011	0.052
Household size <sup>(3)</sup>	-0.024	0.037	-0.088	0.057
Income earner <sup>(2)</sup>	0.021	0.029	0.039	0.053
Income earner <sup>(3)</sup>	-0.025	0.033	0.014	0.060
Household income				
<i>SMEs' Characteristics</i>				
Age of enterprise	0.000	0.003	-0.004	0.005
Manufacturing sector	-0.028	0.038	0.127	0.082
Service sector	-0.040	0.036	0.110	0.078
Size of enterprise	0.009	-0.003**	0.025	0.008***
Ownership	-0.006	0.033	-0.082	0.064
<i>Networking</i>				
Commercial bank	-0.005	0.007	-0.052	0.014***
NGOs	-0.002	0.005	-0.013	0.009
MFI	0.003	0.007	0.003	0.013
Business associations	-0.009	0.010	-0.015	0.016
logsigma1	-1.651	0.036	0.000	
logsigma2	-1.574	0.158	0.000	
sigma1	0.192	0.007		
sigma2	0.207	0.033		
rho1	-0.056	0.146		
rho2	-0.870	0.109		
Log likelihood	-41.541			
LR test of indep. Eqns	4.720			
Number of observations	498.000			
Wald test	18.100			

\*, \*\* and\*\*\*, represent the 10%, 5% and 1% significance levels, respectively.

Source: Author's calculations based on survey data

## 5.9 Chapter Conclusions

Using cross sectional data in 2014, this chapter provides the empirical results on the factors that influence accessibility to microcredit, factors that influence the choice of microcredit providers and factors that affect the financing rate charged on microloans. The study employs logistic regression to investigate the determinants of accessibility to microcredit among SMEs. The factors include being married, ethnicity, financial training, household income, age of the enterprise, ownership, networking with non-governmental organizations, networking with a microfinance institution, networking with business associations and distance of the business premises to the nearest microcredit provider are statistically significant in influencing SMEs' accessibility to microcredit.

This study also attempts to determine the factors that affect the choice of microcredit providers. The choices of microcredit providers include commercial banks, development financial banks and microfinance institutions. Based on a multinomial logit model, the results show owner characteristics have no influence on determining microcredit provider choices. However, different lending characteristics of microcredit providers for loans such as loan amount, distance of the business premises to the microcredit provider, loan processing, loan duration and mode of interest payment are significant in influencing microcredit demand among the borrowers.

The study used a multiple regression model to investigate the loan rate charged by microcredit providers for microloans. The results show the loan rate charged on microcredit loans can be explained by SME characteristics, loan characteristics, networking and creditworthiness.

Additionally, this study demonstrated the impact of access to microcredit on SME performance that was measured by sales growth and employment growth. Using PSM estimation, SMEs that borrow from microcredit providers exhibit a positive, significant impact on sales growth over non-borrowers. This study employed two types of matching estimators and found both kernel and radius matching demonstrated similar results that the impact of microcredit on sales growth is statistically significant at the 1% level. There is no significant impact on employment growth regardless of the matching method used. To overcome unobservable bias, the DID method is employed in this study using panel data. Based on the standard DID estimation, the impact of microcredit on sales growth shows a large difference in magnitude after elimination of possible bias.

Furthermore, the ESR model is used to control with potential endogeneity. The results are consistent with PSM and DID and, therefore, this seems give credence to the conclusion that access to microcredit positively contributes to the performance of SMEs in Malaysia in terms of sales growth.

However, this study does not find any significant relationship between the use of microcredit and employment growth. The empirical evidence on the capacity of SMEs to generate employment are somewhat unexpected because the result is insignificant for PSM, DD and ESR estimates.

## **Chapter 6**

### **Summary and Conclusions**

This chapter summarises the research. Section 6.1 presents a summary of the study background, objectives, data and methodology. Section 6.2 provides the major findings of the study. Section 6.3 presents the implications of the research findings. Section 6.4 discusses the research limitations and Section 6.5 provides recommendations for future research.

#### **6.1 Summary**

SMEs in Malaysia are the backbone of the national economy of the country. The major handicaps in the development of SMEs, as cited in the literature, include insufficient finance and lack of access to credit. Notably, there is substantial evidence that access to credit provides benefits to businesses and impacts business growth. Lack of access to credit might potentially decelerate SMEs' growth and development. Therefore, the central bank of Malaysia, BNM, introduced a Microfinance Institutional Framework in August 2006 that considers microcredit as one innovative credit support for SMEs that lack access to traditional banks with the probability of increasing accessibility to and sufficiency of credit for SMEs to bridge the financing gap. Unfortunately, the census profile of SMEs conducted by Malaysia's Department of Statistics in 2016 reported that only 21.9% of SMEs in Malaysia receive formal financing such as from banks, and other financial institutions including microfinance.

Studies of microcredit accessibility and its impact on SMEs particularly in Malaysia are still limited in the literature. This study set out to bridge that gap in the literature. The research objectives were: (1) to identify the determinants that influence the accessibility to microcredit by SMEs in Malaysia; (2) to examine the factors influencing the choice of microcredit providers by SMEs in Malaysia; (3) to determine the factors that affect the microcredit interest rate charged to SMEs in Malaysia; (4) to evaluate the impact of microcredit on the performance of SMEs in Malaysia; and 5) to provide policy implications from the research findings.

To achieve the research objectives, we use primary data based on a semi-structured questionnaire. The questionnaire was personally administered between February and March 2016 to SMEs in Terengganu. Using convenience sampling, 498 useable responses were grouped into microcredit borrowers and non-borrowers. 386 respondents were categorised as microcredit borrowers and 112 as non-borrowers. This study focuses on the microcredit provided by various microcredit providers such as microfinance institutions, commercial banks and development financial institutions.

This study employed different econometric techniques to achieve the research objectives. We used cross sectional data and employed a logistic regression to analyse the factors that influence SMEs' access to microcredit. The dependent variable is binary where one represents access to microcredit and zero otherwise. This research extends studies on SMEs' behaviour regarding the choice among different microcredit providers but is restricted to three financing options (microfinance institutions, commercial banks and development financial institutions). The dependent variable denoted as choice has no particular order and is categorical and consists of more than two options thus, the multinomial logit model was chosen to analyse the factors influencing the choice of microcredit providers by Malaysian SMEs. Microfinance institutions are used as a base reference or reference against which the other choices are compared. Aside from determining the factors that influence accessibility to microcredit and SME's choice of microcredit provider, this study also endeavours to investigate the factors that affect the finance rate charged by microcredit providers using the ordinary least squares estimation method. Before estimating the models, we test for multicollinearities using the variance inflation factor (VIF) and heteroscedasticity using the Breusch-Pagan test.

This study set out to assess the impact of microcredit on SME performance using three methods (PSM, DID and ESR). These methods can overcome selection bias and endogeneity issues common in microcredit impact evaluation. The use of the PSM method is to correct for sample selection bias because of observable differences between the treatment and control groups; DID can minimize the selection problem of unobservable factors. Another econometric problem in assessing the impact of microcredit is endogeneity because of the non-random allocation of credit. Microcredit providers can screen SMEs' applications, so it is likely that credit is distributed to better-off enterprises, which are presumed to yield better performances. For example, SMEs that can access credit can expand and generate higher profits, thereby promoting growth. Similarly, other SMEs have lower growth because of the difficulty of obtaining credit. Thus, access to microcredit can be endogenous. Hence, this study employed the ESR model to overcome endogeneity issues. Sales and employment growth for both microcredit borrowers and non-borrowers were used in this study to measure SME performance.

## **6.2 Major Findings**

### ***Objective 1***

Our results show that accessibility to microcredit is determined by several factors. Table 6.1 summarises the empirical results from the models in this study.



- SME owners/managers who are married have a slightly better probability of accessing microcredit than unmarried owners/managers. It is expected that married men and women are more responsible in managing their businesses than single people because of family commitments and family responsibilities, therefore they performed better. Microcredit providers may view married persons as more likely to have a stable income and a good financial position.
- The ethnicity of entrepreneurs is significant in explaining access to microcredit. Malay-owned enterprises have a greater probability of accessing microcredit than other ethnically-owned firms.
- Having received financial management training significantly positively influences access by SME owners/managers to microcredit compared with those who have not had such training. The reason is that those SME owners/managers are more financially literate after receiving the training than those who did not receive financial management training.
- Other owner/manager characteristics such as gender, age, education and experience have no significant effect on SMEs' access to microcredit.
- The household income variable is negative and significant, which indicates that households with low incomes are more likely to access microcredit than households with high incomes. Households with higher incomes may be less budget constrained and therefore are less likely to need to borrow microcredit.
- Household size and number of income earners appeared unimportant in determining access to microcredit.
- The age of the enterprise positively and significantly affects the probability of Malaysian SMEs gaining access to microcredit because the age of an enterprise can be a proxy for determining the business's sustainability and its repayment capability.
- The size of the enterprise as measured by the number of employees and the sector in which the SME operates do not appear to influence access to microcredit by SMEs.
- SMEs registered as sole proprietorships exhibit a positive significant correlation with access to microcredit.

- Networking between social organizations or NGOs, MFIs and business associations exhibit a positive and significant effect on microcredit accessibility.
- The distance variable also is a strong determinant in accessing microcredit.

### **Objective 2**

A multinomial logit model has been employed to determine the factors influencing the choice of microcredit providers by SMEs. The choice of microcredit providers in this study is restricted to only three options: microfinance institutions, commercial banks and development financial institutions. Microfinance institutions are used as a base reference. Table 6.1 summarises the results.

- Owner characteristics such as gender, age, marital status and ethnicity are unimportant factors in determining the choice of microcredit providers.
- Mature SMEs prefer to borrow from commercial banks rather than MFIs.
- The results suggest that SMEs in the service sector prefer to borrow from DFIs rather than from MFIs. They borrow 5.5 times more actively from DFIs than from MFIs. The results are reasonable in the sense that DFIs have a competitive advantage over MFIs such as recognisability by the people and a good infrastructure.
- SMEs that require a large *amount* of credit (more than RM25,000) prefer to borrow from DFIs over MFIs. The maximum amount of financing for DFIs is RM50,000 but the maximum for MFIs is less than RM25,000.
- SMEs that want to borrow for a long term are more likely to borrow from commercial banks or DFIs rather than MFIs. This indicates that commercial banks and DFIs are common or popular microcredit providers for long term borrowing. From the lender perspective, the capital base of MFIs is still very small compared with commercial banks and DFIs. This is a major reason why MFIs are unable to grant long term credit to SMEs.
- The mode of interest payments is a statistically significant factor influencing the choice between commercial banks and MFIs.
- The distance to a microcredit provider from the business premises influences the choice of a microcredit provider.

**Table 6.1 Factors influencing SMEs' access to microcredit, microcredit provider choice and interest rate charged**

	Accessibility to microcredit	Choice of microcredit provider		Interest rate charged	
		CB vs MFIS	DFIs vs MFIS	Model 1	Model 2
<b>Owner Characteristics</b>					
Gender	(0)	(0)	(0)	(0)	(0)
Age <sup>(2)</sup>	(0)	(0)	(0)	(0)	(0)
Age <sup>(3)</sup>	(0)	(0)	(0)	(0)	(0)
Marital status	(+)	(0)	(0)	(0)	(0)
Ethnicity	(+)	(0)	(0)	NI	NI
Education	(0)	NI	NI	(0)	(0)
Received financial training	(+)	NI	NI	NI	NI
Experience	(0)	NI	NI	NI	NI
<b>Household Characteristics</b>					
Household size <sup>(2)</sup>	(0)	NI	NI	NI	NI
Household size <sup>(3)</sup>	(0)	NI	NI	NI	NI
Income earner <sup>(2)</sup>	(0)	NI	NI	NI	NI
Income earner <sup>(3)</sup>	(0)	NI	NI	NI	NI
Household income	(-)	NI	NI	NI	NI
<b>SMEs' Characteristics</b>					
Age of enterprise	(+)	(+)	(+)	(-)	(0)
Manufacturing sector	(0)	(0)	(0)	(0)	(0)
Service sector	(0)	(0)	(+)	(0)	(0)
Size of enterprise	(0)	(0)	(0)	(0)	(0)
Ownership	(+)	(0)	(0)	NI	NI
<b>Networking</b>					
Commercial bank	(0)	(0)	(0)	(0)	(0)
NGOs	(+)	NI	NI	NI	NI
MFI	(+)	(0)	(0)	(0)	(0)
Business associations	(+)	NI	NI	NI	NI
<b>Loan Characteristics</b>					
Size of loan	NI	(+)	(0)	(+)	(+)
Loan process	NI	(0)	(0)	NI	NI
Short term	NI	(0)	(0)	(-)	(0)
Long term	NI	(+)	(+)	(0)	(0)
Monthly paid	NI	(+)	(+)	(0)	(0)
<b>Type of microcredit provider</b>					
Commercial bank	NI	NI	NI	(0)	(-)
MFIs	NI	NI	NI	(0)	(0)
Accounting book	NI	NI	NI	(-)	(-)
Distance in km	(+)	(+)	(+)	NI	NI

Note: 1) (+), (-), and (0) represent positive, negative and no significant effects, respectively

2) NI indicates that the variable is not included in the model

### **Objective 3**

Table 6.1 summarises the results on the choice of microcredit providers among SMEs.

- The age of the enterprise coefficient is negative which indicates an inverse relationship between the age of the enterprise and the interest rate charged. This implies that increasing the age of the enterprise leads to a decreased interest rate because the lender may view mature SMEs as established enterprises. Furthermore, the lenders may be prepared to finance riskier borrowers if they can subsequently offset the higher default rate by applying higher interest rates to young SMEs.
- Short loan duration is negatively related to a higher interest rate. In Model 1, a negative relationship between short loan duration and interest rate charged specifies that short term loan duration tends to decrease the interest rate more than medium term. However, this variable is insignificant in Model 2.
- Loan amount is positively associated with the interest rate charged on a microloan; this is significant at the 10% and 1% levels for Models 1 and 2, respectively.
- In Model 2, networking with a commercial bank gives an SME a lower interest rate. This result is statistically significant at the 10% level.
- Having accounting books is statistically significant at the 1% level for both models. SMEs with accounting books experience lower interest rates than those that do not have them.

### **Objective 4**

With regard to the impact of access to microcredit on SME performance, the finding confirms that access to microcredit has a significantly positive impact on sales growth but is insignificant on employment growth. Two types of matching estimators were used in this study; kernel and radius matching; both generated similar results. The DID method was employed after using PSM to mitigate the bias that arises from unobservable characteristics. After minimizing the selection bias that arises from both observable and unobservable characteristics, the magnitude is much larger before mitigating the unobservable characteristics. Using PSM, the parameter estimates show that SMEs borrowing from a microcredit provider experienced 25.6% to 25.7% higher sales growth in 2014 than non-microcredit borrowers. The sales growth of microcredit borrowers increased by 28.7% percent more than that of non-microcredit borrowers.

The endogeneity issue in the model is controlled by applying the endogenous switching regression model with an instrument variable. The ESR model is applicable to estimate the impact of a binary endogenous treatment variable on a continuous outcome variable. The ESR model enables us to understand the factors that influence sales and employment growth for microcredit and non-microcredit borrowers discretely.

In summary, the results for the factors that influence sales growth show that:

- The significant, positive impact of financial training on sales growth for microcredit borrowers shows that financial training plays an effective role in contributing to microcredit borrowers' greater improvements in sales growth. Conversely, the negative, significant effect of financial training on non-borrowers exhibits that financial training negatively affects sales growth.
- The sales growth of microcredit borrowers is determined by household size but that has no effect on non-borrowers. Households with four (*Household size*<sub>(2)</sub>) and five or more people (*Household size*<sub>(3)</sub>) exhibit a greater positive, significant effect on sales growth than household size of fewer than three people. This indicates that a larger household leads to increased sales growth. To some extent, large households might reduce savings and increase expenses so therefore there is an advantage in promoting higher sales growth.
- The size of a firm represented by the number of workers in the SME indicates a significant, positive impact on sales growth for both microcredit borrowers and non-borrowers. This is because the growing number of workers in the workforce contributes to productivity and subsequently an increase in sales growth.
- For microcredit borrowers, the result suggests that sole proprietorship positively influences SMEs' sales growth. This is because the owner is dominant and has more direct control on business finances than a partnerships structure.
- The networking with microfinance institutions variable shows a positive, significant effect on sales growth for microcredit borrowers. SMEs that have network ties with MFI officials exhibit increased sales growth. This could be because good rapport with MFI officials may have exposed SMEs to different ideas and broader sources of information. This variable is insignificant for non-borrowers.
- Gender has no impact on sales growth for microcredit borrowers, but it influences sales growth for non-borrowers. For non-borrowers, the evidence suggests that a male-owned enterprise is likely to experience greater increased sales than a female-owned enterprise. A male-owned enterprise contributes to the sales growth of the enterprise because of the

cultural orientation that the male is the breadwinner and the person to make decisions for the family.

The ESR result is consistent with the results obtained from PSM and DD. It is convincing to conclude that having access to microcredit helps SMEs grow more in terms of sales than non-borrowers.

In summary, the factors that influence employment growth show that:

- The relationship for financial training is complex; there is a positive impact between financial training and sales growth for microcredit borrowers but a negative, significant effect on the non-borrowers' group.
- There is a positive, significant relationship between the size of an enterprise effect and employment growth for both borrowers and non-borrowers. Interestingly, the employment growth of microcredit borrowers is slightly higher than that of their non-borrowing counterparts.
- The networking with a commercial bank effect is negative and significant which implies that networking with a commercial bank decreases SMEs' employment growth. This is because SMEs have not fully utilized the networking with the commercial banks.

The ESR suggests that employment growth decreases if the respondent belongs to the non-borrower group, but the result is insignificant hence inconclusive. This study failed to provide evidence on the impact of access to microcredit on employment growth.

### **Objective 5**

This study also establishes benchmarks for policy makers that would be helpful in improving future access to microcredit in relevant policy formulation and research related to small business performance. In terms of policy implications, the objective of microcredit is to enhance SMEs' performance it enables them to improve and increase sales growth. Therefore, continued efforts should be made to enable SMES to access microcredit. First, the Malaysian government should provide financial management training for SME owners/managers. Financial training is one factor that could assist borrowers to access to microcredit as reported in the report of *ASEAN Strategic Action Plan for SME development (2016-2025)*. According to the ADB report (2018), the lack of knowledge or low level of financial literacy is a major barrier in strengthening financial inclusion among SMEs. The importance of financial training enables SMEs to become financially literate. This might help SMEs owners/managers make better informed business decisions. Furthermore, SMEs

will be educated about the legal and other procedures in obtaining external financing through training.

For microfinance to be effective, the microcredit providers must understand the requirements of SMEs to be able to design microcredit that matches the SMEs' financial preferences and requirement. In the long-run, microcredit providers should embark on branch expansion to establish their presence in areas where there are no microfinance institutions. Expanding their operations to other areas would enhance their contribution to microcredit availability in the economy since distance influences access to microcredit. Besides, SMEs might not have enough resources to travel frequently to the microcredit providers' places. This current study recommends microcredit providers support their SME clients by building long term and sustainable business relations. SME owners/managers who are not well educated may find it hard to find relevant information particularly in finance. Therefore, microfinance institutions need to maintain regular contact with the SMEs to spread the information and provide better understanding about credit that is available for SMEs.

### **6.3 Implications of the Research Findings**

The findings of this study have several main implications for academics, SME owners/managers and policymakers. This study augmented current knowledge and provides a better understanding of microcredit.

#### **6.3.1 Theoretical Implications**

Since there is a lack of studies on access to microcredit and SMEs' performance in Malaysia, this study provides empirical evidence of the relationship between access to microcredit and SMEs' performance measured by sales and employment growth. The findings in this research allow the drawing of a few inferences.

SMEs that received financial training are assumed to be financially literate and have better access to microcredit than those who have no training. As in Fatoki and Asah's (2011) study, this study implies that financial training improves SMEs' chances to access microcredit because the skills and knowledge of finance make literate SMEs more capable of providing microcredit providers with greater confidence that the microcredit provided will be more profitably utilized and a better repayment capacity exhibited.

Interestingly, this study exhibits imperative evidence in the microfinance literature because microcredit targets low income people and thus it would be expected that households with low incomes would be more likely to access microcredit than those with high incomes. Thus, it parallels the objective of microfinance which is to assist poor people (Khandker, 1998).

The findings of this study also contribute to the current understanding of SMEs in the literature. It should be noted that network relationships are crucial for SMEs to access microcredit. SMEs that have intensive interactions and networking can obtain reliable credit opportunity information from external actors in their networks, most notably NGOs, MFIs and business associations.

This study also documents SMEs' choices for the different microcredit providers available in Malaysia. This study sought to understand the current factors affecting microcredit provider choices among SMEs. The loan characteristics such as loan amount, loan duration and mode of payment were considered the strong determinants in the making of choices among different microcredit providers.

This study raises the question whether access to microcredit leads to better performance of SMEs. The findings on the impact of access to microcredit show that microcredit borrowing has a significant impact on improving the SMEs' sales growth. This result is comparable to Sebstad & Walsh's (1991) study in which they noted a positive impact of microcredit on enterprise sales. In contrast, this study finds no strong evidence on the impact of access to microcredit on employment growth. The possible reason for the insignificant impact of microcredit on employment growth is that SMEs often employ only a few people, such as friends or relatives as workers. This study also tried to discover the factors that contribute to accelerating the performance of SMEs. Based on microcredit borrowers' characteristics, financial training, household size, size of enterprise, ownership and networking with MFIs expedite sales growth.

### **6.3.2 Managerial Implications**

The findings of this study also provide managerial implications. SMEs can take positive initiatives to improve their access to microcredit. The Malaysian government has created many programmes to support the development of SMEs through a comprehensive set of financial assistance measures. Therefore, SME owners must take greater responsibility for their own learning. They need to create a positive attitude towards entrepreneurship and training. SME owners need to increase their skills, especially by joining financial training and development programmes if they want to be competitive and survive in the market long term. SME owners should recognise that asymmetric information



reduces SMEs' access to microcredit. Most training programs are run by experienced speakers or trainers who are usually from financial institutions, agencies or government ministries. Hence, SMEs need to be proactive in seeking the opportunities to build networking ties with the microcredit providers. SME should expand their repertoire of networking skills because it is particularly beneficial to SMEs, especially in gaining credit information or programs and thus better access to credit and lead to expedite sales growth.

### **6.3.3 Policy Implications**

This study establishes the benchmarks for policymakers that would be helpful for improving future business related policy formulation and research related to small business performance. This study provides the desire of stakeholders to have first-hand information on the specific factors that influence access to microcredit among Malaysian SMEs. Different policy implications related to improving microcredit accessibility and impacts can start from the government to microcredit providers and SMEs. The government should have a better understanding of SMEs businesses and performance to formulate better policy towards microcredits for SMEs.

The study results indicate that the SMEs' inadequate access to microcredit can be due to their poor knowledge of microcredit programme offered by other financial institutions such as commercial banks and development financial institutions beside the traditional microcredit institutions such as AIM, TEKUN and MARA . Thus, to improve the SMEs' accessibility to microcredit, there is an imperative for the government to enhance promotion of its microcredit programme among the SMEs owners and make them fully aware of the features of microcredits. This can be done through SMEs associations meetings (or social gatherings) and mass media such as radio and newspaper.

The microcredit accessibility model shows that distance is a barrier to access microcredit among SMEs because distance is associated with high transaction costs such as travel costs. Thus, many SMEs exclude themselves from microcredit borrowing. The microfinance institutions should consider the adoption of technology to help SMEs borrowers to overcome the distance barrier. For instance, mobile phone finance allows the borrowers to perform their financial transactions such as payments or apply for a microloan. Similarly, electronic banking (e-finance) enables SMEs to apply for the microloan online. Telephone and e-finance can be introduced to reduce transaction costs for customers and to make service delivery more effective for MFIs.

The strong link between repayment capacity (perceived by SME owners) and access to microcredit indicates that increasing SME owners' repayment capacity helps increase their access to microcredit. Hence, it is important for the microfinance institutions to combine micro loans with other services or products that help improve the efficiency of loan use, which in turn helps build up the SME owners' confidence in repaying loans. A useful service is to provide borrowing SMEs with the evaluation of profitability of the loan-supported projects. Other services may include agricultural technical extension, off-farm business introduction and training in cash flow and risk management.

This research demonstrates the potential influence of microcredit programmes on SME growth and development. Therefore, policy makers should be motivated to establish supportive regulatory environments in which the microfinance sector can gain sustainable development. It would be appropriate to legally permit non-financial institutions (NFIs) including NGOs to provide some form of financial services including microcredit. This expands NFIs' ability to raise funds for their microfinance businesses from multiple sources such as the public deposits and financing support from the Bank Negara (Malaysia Central Bank), and therefore, helps them achieve sustainable development.

The study result also found that the owner of SMEs who received financial management training significantly influence their access to microcredit. Therefore, the government should provide financial management training to assist and improve the financial literacy of SME owners (Fatoki & Asah, 2011). SME owners with better financial knowledge are able to maintain comprehensive financial records and are more likely to have access to credit. Thus, financial training further develops financial literacy since experts agree that self-financial behaviour comes from a knowledge of finance (Hilgert et al., 2003). The lack of financial knowledge can dampens borrowers' access to credit regardless of credit availability in the markets (Miller, 2009). Besides, the knowledge and skills about finance (i.e., financial management) provide microcredit providers with greater confidence that the credit given will be profitably utilize and exhibit higher repayment capacity, thus improved access to credit.

The credit accessibility model demonstrated that SME with networking has better access to microcredit. This means that SMEs with fewer network ties face lower probability in accessing microcredit due to the existence of high levels of asymmetric information between them and potential financiers. As a result, they tend to ration themselves out from the credit market, which impede the growth and development of their business. Therefore, policymakers should concentrate on providing specific support for those enterprises that are in serious need of microloan and are actively demanding it. Policymakers must find ways of redirecting support away from established

SMEs towards SMEs who are in greater need of credit, but are less able to access it due to significant asymmetric information between them and their potential microcredit providers. This could be done by developing effective mechanisms for guaranteeing SMEs in innovative industries that have significant potential for long-term growth to get the opportunity to access microcredit albeit without the obligatory network ties.

Lack of financial information and credit history on SMEs in Malaysia has been an issue among academic and policy researchers. One way to overcome this lack of this is for the government to devise effective policies to address this issue. SMEs should comply with the regulations as the availability of financial information can benefit not only the SMEs but also the academicians and policymakers. The availability of financial data can facilitate the understanding of the financial practices among SMEs. Policymakers might adopt a user-friendly accounting system that will encourage SMEs to be more transparent in financial dealings. In addition, SMEs that choose to provide financial information might send a quality signal to potential lenders. Therefore, indirectly assist SMEs in getting better access to external financing, since it may enhance the loan providers to assess creditworthiness of loan applicants from the SME sector.

Finally, another important issue is the discrimination in financing facilities and accessibility among ethnic groups. There are many incentives given by the government to SMEs. The study findings show that there is unfair treatment for non-Malay-owned SMEs in accessing microcredit. Indeed, the government explicitly favour Malay-owned businesses because the government intended to boost the participation of Malays owned SMEs which are dominated by other ethnicities (Hamidon, 2008). Nevertheless, the government should guarantee that the rhetoric of ethnic equality to be practically implemented in the funding policy. The government could review the existing quota on grants and loans and increase the quota for the non- Malay-owned businesses gradually.

The study also has implication for lenders. The common use of relationship-based lending technique implies potential risks for lenders. The credit accessibility model demonstrated that established or mature SMEs have greater access to microcredit than young enterprises, but the age of the enterprise does not matter in SMEs performance measured by sales and employment growth. Therefore, selecting based on the relationship or the age of SMEs alone might result lender to make poor decision.

Finally, the study recommends that government policies toward SMEs credit accessibility should focus on both sides, lenders and creditors. From creditor perspective, policies to upgrade SMEs

capacity (including management ability, business support, customer relationship development, etc.) would lead to better access to microcredit and higher growth speed. From lender perspective, better regulations would ensure formal financial institutions to target the right sectors rather than lending excessively to unproductive sectors as have been common in recent years. Thus, the government should ensure that all business sectors enjoy the same opportunity to access credit. In addition, result from the model on determinants of SMEs loan rate suggests that a stable monetary policy is necessary to enable SMEs credit market to be driven by market factors (such as creditworthiness) rather than non-market factors such as relationships or owner's demographic characteristics.

#### **6.4 Research Limitations and Future Research**

This study has a number of possible limitations, but these limitations provide insight into areas that future studies might address.

- First, this study relies on a sample of SMEs located solely in Terengganu and, therefore, generalizations cannot adequately extend to SMEs outside Terengganu. The findings of this study may not be representative of the whole country. Future researchers can consider other geographical areas to see whether the findings remain consistent.
- Secondly, the determinants of access to microcredit did not take into account the separation between SMEs located in urban or rural areas. Future researchers can construct strata of enterprises located in urban, small towns or rural areas to test for differences in accessibility to microcredit. SMEs located in metropolitan areas may have a higher probability of access than those in rural areas. The credit needs of the urban SMEs may differ from those in rural areas
- Thirdly, in terms of the choice of microcredit providers among SMEs, many important credit attribute variables were not tested in this study such as interest rate and the type of loan, whether group or individual lending. Since individual and group lending have become synonymous with microfinance (United Nations Development Programme, 2008) future researchers can include this variable and compare the two loan types.
- This research relies heavily on the data collected only among SMEs, thus future studies could also consider a qualitative method. Interviews or focus group discussion with the microcredit officers could lead to more in-depth insights of issues that have different implications for the enterprise growth.

- The impact of access to microcredit in this study has been measured by sales and employment growth because of the difficulty in obtaining financial data from SMEs. Most Malaysian SMEs are especially reluctant to reveal their financial data and so are less cooperative than they might be. Future studies may include other outcome variables such as total assets, stocks or equity.
- Based on the recent statistics by SME Corporation in 2017, most of the SMEs are domestically-oriented. SMEs' export contributed only 19% of the nation total export. Thus, future studies can identify SMEs with export potential in terms of their owner characteristics, firm characteristics and business activities. In addition to lack of access to credit, SMEs face severe barriers such as foreign currency risks, shortage of export insurance and granting facilities or payment delay to foreign customers. Thus, they tend to be passive or negligent of the export market, As such, future studies can investigate how to remove those barriers to enhance SMEs' potential to export.

## Appendix A

### A.1 Tests for Multicollinearity and Heteroscedasticity

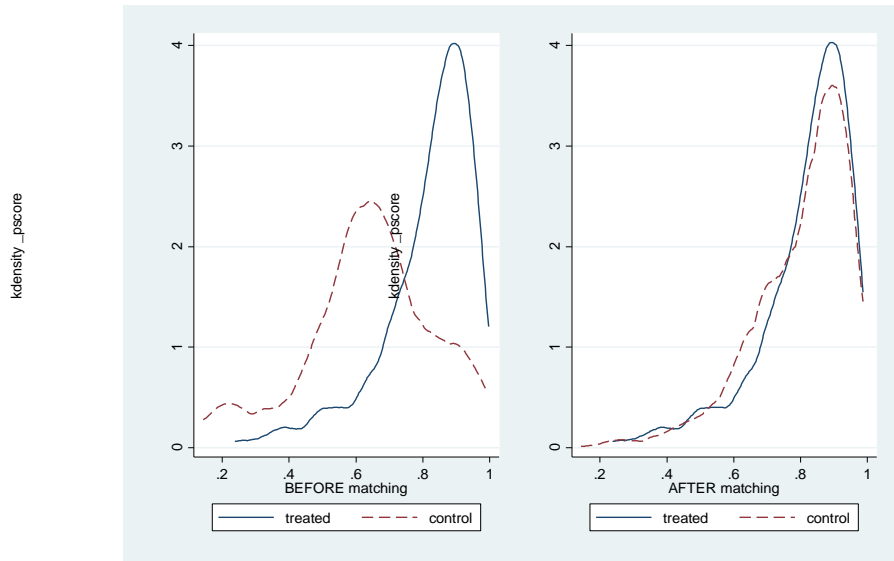
	Determinants of access to microcredit (Logit Model)	Factor in choosing microcredit provider (Multinomial Logit)	Determinants of interest rate charged on loan (OLS)	
			Model 1	Model 2
Mean VIF of multicollinearity	1.94(<10)	1.78(<10)	1.85(<10)	1.85(<10)
Breusch Pagan/ Cook-Weisberg (BP/CW)	104.77 (0.000)	6.63 (0.9929)	73.86(0.000)	104.86(0.000)

Note: 1) A VIF of 10 or greater indicates the presence of multicollinearity  
 2) Numbers in parentheses are the probability > chi2 for BP/CW test

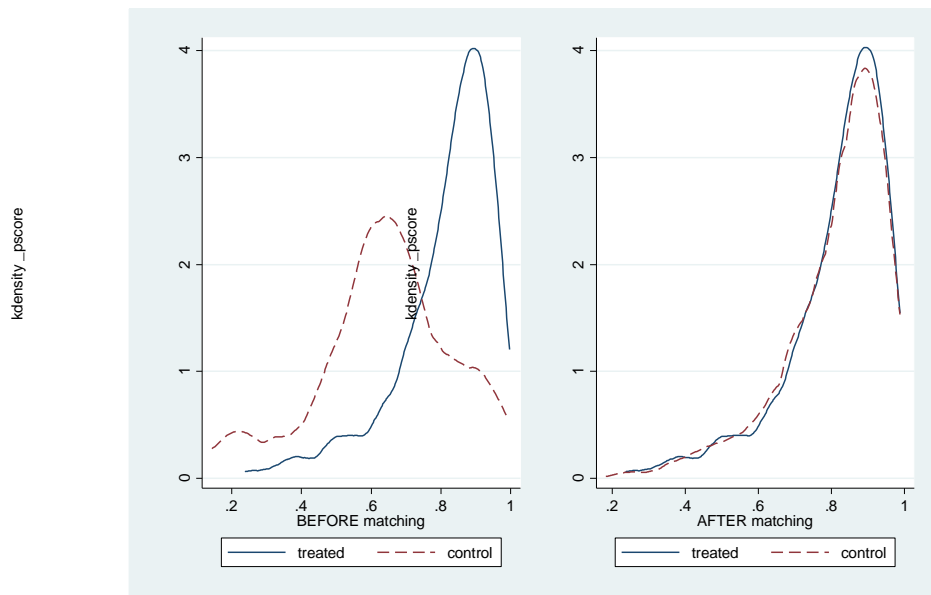
## A.2 Covariate balancing: mean differences before and after matching: Radius matching

Variable	Unmatched	Mean		%bias	%reduct  bias	t-test	
	Matched	Treated	Control			t	p> t
Gender	Unmatched	0.738	0.759	-4.7		-0.44	0.661
	Matched	0.738	0.735	0.5	90	0.07	0.948
Age <sup>(2)</sup>	Unmatched	0.368	0.411	-8.8		-0.82	0.411
	Matched	0.369	0.363	1.2	85.8	0.18	0.861
Age <sup>(3)</sup>	Unmatched	0.521	0.339	37.2		3.42	0.001
	Matched	0.519	0.493	5.4	85.4	0.73	0.463
Married	Unmatched	0.956	0.813	45.8		5.16	0.000
	Matched	0.956	0.954	0.5	98.9	0.1	0.918
Ethnic	Unmatched	0.793	0.661	29.9		2.91	0.004
	Matched	0.792	0.785	1.6	94.7	0.24	0.811
Financial management training	Unmatched	0.744	0.616	27.5		2.64	0.008
	Matched	0.743	0.750	-1.5	94.6	-0.22	0.826
<i>Income earner</i>							
Income earner <sup>(2)</sup>	Unmatched	0.316	0.304	2.7		0.25	0.802
	Matched	0.317	0.310	1.5	43.6	0.21	0.833
Income earner <sup>(3)</sup>	Unmatched	0.352	0.241	24.5		2.22	0.027
	Matched	0.351	0.343	1.7	92.9	0.23	0.818
Age of enterprise	Unmatched	11.640	7.304	82.3		7.68	0.000
	Matched	11.582	11.328	4.8	94.1	0.64	0.524
Ownership of enterprise	Unmatched	0.883	0.875	2.6		0.24	0.809
	Matched	0.883	0.894	-3.4	-31.2	-0.49	0.627
<i>Sector</i>							
Manufacturing	Unmatched	0.264	0.250	3.3		0.3	0.763
	Matched	0.262	0.308	-10.4	-220.5	-1.4	0.161
Service	Unmatched	0.635	0.696	-13.1		-1.2	0.229
	Matched	0.636	0.634	0.5	96.5	0.06	0.950

### A.3 Distributions of Propensity Scores Before and After Matching using Radius Matching



### A.4 Distributions of Propensity Scores Before and After Matching using Kernel Matching





## A.5 Results for validity of instruments (using Probit and OLS)

Variable	Probit		OLS			
	Access to Microcredit		Outcome of interest			
	Coefficient	R.S. E	Sales Growth		Employment Growth	
Coefficient			R.S. E	Coefficient	R.S.E	
<i>Owner/Manager Characteristics</i>						
Gender	0.151	0.184	0.068	0.034**	0.013	0.021
Age <sup>(2)</sup>	0.173	0.220	-0.001	0.048	-0.008	0.029
Age <sup>(3)</sup>	0.089	0.286	-0.028	0.060	-0.013	0.036
Married	0.786	0.275***	0.091	0.058	0.055	0.035
Ethnic	0.392	0.187**	0.017	0.037	0.016	0.022
Education	-0.012	0.161	-0.013	0.030	0.013	0.018
Received financial training	0.562	0.171***	0.062	0.033**	-0.001	0.020
Experience	-0.216	0.177	0.047	0.034	0.002	0.021
<i>Household Characteristics</i>						
Household size <sup>(2)</sup>	0.043	0.229	0.082	0.047*	-0.008	0.028
Household size <sup>(3)</sup>	0.046	0.241	0.061	0.050	-0.018	0.030
Income earner <sup>(2)</sup>	-0.102	0.216	0.018	0.042	0.023	0.026
Income earner <sup>(3)</sup>	0.138	0.248	0.071	0.048	-0.019	0.029
Household income	-0.341	0.106	0.006***	0.018	-0.006	0.011
<i>SMEs' Characteristics</i>						
Age of Enterprise Manufacturing sector	0.074	0.019	0.002	0.004	0.001	0.002
Service sector	-0.161	0.335	-0.030	0.057	-0.010	0.035
Size of Enterprise	0.006	0.324	0.002	0.054	-0.019	0.033
Ownership	-0.030	0.029	0.019	0.005***	0.010	0.003***
Networking	0.672	0.266**	0.118	0.046**	0.002	0.028
Commercial Bank	0.069	0.056	0.014	0.010	-0.012	0.006**
NGOs	0.083	0.036**	-0.002	0.007	0.000	0.004
MFI	0.190	0.048***	0.028	0.009***	0.007	0.006
Business Associations	0.115	0.069**	-0.023	0.014	-0.009	0.008
<b>Distance</b>	<b>-0.023</b>	<b>0.007***</b>	<b>-0.002</b>	<b>0.001</b>	<b>-0.001</b>	<b>0.001</b>
Log likelihood	-186.951					
LR chi2(23)	157.010					
Pseudo R2	0.296					
No. of observations	498					

Note: \*, \*\* and \*\*\*, represent 10%, 5% and 1% significance levels, respectively

## A.6 List of Participating Banks

<b>PARTICIPATING BANKS</b>	<b>LOAN SIZE</b>	<b>PURPOSE OF FINANCING</b>	<b>LOAN PROCESSING</b>	<b>ECONOMIC SECTOR</b>
AGROBANK	RM1,000 – RM50,000	Working capital Capital expenditure	6 working days (from submission of full documentation)	Agro-based Industries and related services and manufacturing activities Cottage enterprises
BANK RAKYAT	•RM1,000 – RM50,000	Working capital Capital expenditure	5 – 10 working days	Agriculture Services Retailing & trade Manufacturing
BSN	RM5,000 – RM50,000	Working capital Capital expenditure	6 working days (subject to complete documentation)	Manufacturing Retailing/wholesale Services
ALLIANCE BANK	RM5,000 – RM50,000	Working capital Capital expenditure	2 working days (subject to complete documentation)	All sectors
AMBANK	RM5,000 – RM50,000	Working capital Capital expenditure	7 working days (subject to complete documentation)	Retail Services & trade Manufacturing
CIMB BANK	RM3,000 – RM50,000	Working capital Capital expenditure	1 working day	All sectors
BANK MUAMALAT	RM5,000 – RM50,000	Working capital Capital expenditure	6 working days (from submission of full documentation)	All sectors
MAYBANK	Maybank Microfinance: RM1,000 – RM10,000 SME Micro Financing: RM20,000 – RM50,000	Working capital Capital expenditure	2 – 6 working days (subject to complete documentation)	All sectors / selected sectors based on products
PUBLIC BANK	RM3,000 – RM50,000	Working capital Capital expenditure	6 working days	Agriculture Services & trade Manufacturing
UNITED OVERSEAS BANK	RM5,000 – RM50,000	Working capital Capital expenditure	4 - 5 working days (upon receipt of complete documentation)	All sectors

Source: Bank Negara Malaysia website updated as at April 2016

## Appendix B

### B.1 Survey Questionnaire for SMEs

#### Accessibility to Microcredit and Its Impact on Small and Medium Sized Enterprises Performance in Malaysia

Instructions: For each question with boxes provided, please tick your answer(s); otherwise, please follow the instructions given to answer the questions. **There are FIVE (5) sections, you need to answer only the relevant parts, please follow the guidelines.** Your participation is voluntary, and all of your answers will be kept confidential. Only summary measures and conclusions from this survey will be reported.

#### SECTION 1: FINANCE FOR YOUR BUSINESS

1. Did you have any difficulty in obtaining a loan(s) in the last 2 years?
  - a. Yes (go to **Q2**) [       ]
  - b. No (go to **Q3**) [       ]
  
2. If **YES in Q1**, what were the reasons? (You may choose **more than one**.)
  - a. Interest rates are too high [       ]
  - b. Did not have adequate documents [       ]
  - c. Do not have adequate collateral [       ]
  - d. Do not have any relationship with credit officials [       ]
  - e. Business performance was not good [       ]
  - f. Other(s), please specify \_\_\_\_\_ [       ]
  
3. Did you need to borrow money in 2014?
  - a. Yes (go to **Q4**) [       ]
  - b. No (go to **SECTION 3**) [       ]
  
4. Was your loan application in **Q3 approved**?
  - a. Yes (go to **Q6**) [       ]
  - b. No (go to **Q5**) [       ]
  
5. If **NO in Q4**, what were the reasons why your loan application was rejected? (You may choose **more than one**.)
  - a. I did not have any collateral [       ]
  - b. There was no recommendation from bank staff /local leader [       ]
  - c. Bad credit history [       ]
  - d. Uncertain monthly income [       ]
  - e. I did not have a bank account [       ]
  - f. Other(s), please specify \_\_\_\_\_ [       ]
  
6. How many credit suppliers did you approach during 2014?
  - a. 1-3 [       ]
  - b. 4-6 [       ]
  - c. More than 7 [       ]
  
7. What percentage of your loan applications were successful during 2014?
  - a. Above 80% [       ]

- b. From 60% to below 80% [ ]
- c. From 40% to below 60% [ ]
- d. From 20% to below 40% [ ]
- e. Less than 20% [ ]
8. What was your **total amount of your loan(s) outstanding** in 2014? \_\_\_\_\_ (RM)
9. What was the purpose for your loan(s)? (You may choose **more than one**.)
- a. Buy more stocks, material and supplies [ ]
- b. Expand business [ ]
- c. Buying a car [ ]
- d. Paying off debts [ ]
- e. Urgent temporary shortage of funds [ ]
- f. Making new investment project(s) [ ]
- g. Hiring more workers [ ]
- h. Emergency in family [ ]
- i. Other(s), please specify \_\_\_\_\_ [ ]
10. By what percentage did the loan(s) meet your capital needs?
- a. Above 80% [ ]
- b. From 60% to below 80% [ ]
- c. From 40% to below 60% [ ]
- d. From 20% to below 40% [ ]
- e. Less than 20% [ ]
11. From which source(s) of finance did you obtain loan(s) in 2014? (You may **choose more than one**.)

FORMAL SOURCES		INFORMAL SOURCES	
a. Commercial bank (e.g. Maybank, CIMB, AmBank)	[ ]	a. Family and friends	[ ]
b. Development financial institutions (e.g. BSN, SME Bank, Agro Bank)	[ ]	b. Private money lender	[ ]
c. Microfinance institutions (e.g. AIM, TEKUN, YUM, Yayasan Pembangunan Usahawan)	[ ]	c. Trade credit	[ ]
d. Government assistance	[ ]	d. Other(s), please specify _____	[ ]
e. Credit Cooperative	[ ]		

12. What was the percentage share of finance from each available source in **Q11?** (The sum of these financings must add up to 100 %.)

FORMAL SOURCES	%	INFORMAL SOURCES	%
a. Commercial bank (e.g. Maybank, CIMB, AmBank)		a. Family and friends	
b. Development financial institutions (e.g. BSN, SME Bank, Agro Bank)		b. Private money lender	
c. Microfinance institutions (e.g. AIM, TEKUN, YUM, Yayasan Pembangunan Usahawan)		c. Trade credit	
d. Government assistance		d. Other(s), please specify _____	
e. Credit Cooperative			

13. Given a choice, which type of financing would you prefer?
- Formal sources [       ]
  - Informal sources [       ]
14. What was the highest interest rate you paid for loan(s) in 2014? \_\_\_\_\_ (per annum)
15. What was the lowest interest rate you paid for loan(s) in 2014? \_\_\_\_\_ (per annum)
16. Did any of your loans require collateral?
- Yes (go to **Q17**) [       ]
  - No (go to **Q18**) [       ]
17. If **YES in Q16**, what type of collateral was required? (You may choose **more than one.**)
- Property (e.g., land and buildings) [       ]
  - Machinery and equipment [       ]
  - Personal property (such as car, gold, stocks, etc.) [       ]
  - Receivables [       ]
  - Fixed deposit [       ]
  - Other(s), please specify \_\_\_\_\_ [       ]
18. What was the duration of your **largest loan** in 2014?
- Short term (less than 1 year) [       ]
  - Medium term (more than 1 year to 5 years) [       ]
  - Long term (more than 5 years) [       ]
19. What is the mode of interest payment?
- Daily [       ]
  - Weekly [       ]
  - Monthly [       ]
  - Quarterly [       ]
  - Semi-annual [       ]
  - Other(s), please specify \_\_\_\_\_ [       ]
20. Is there any charge(s) in addition to interest on the loan?
- Yes (go to **Q21**) [       ]
  - No (go to **Q22**) [       ]
21. If **YES in Q20**, what are these charges? (You may choose more than one)
- Administrative or service fee [       ]
  - Insurance fee [       ]
  - Guarantee fee [       ]
  - Other (s), please specify \_\_\_\_\_ [       ]
22. What is the current status of the loan?
- Fully repaid [       ]
  - Currently some outstanding [       ]
  - Overdue [       ]
  - Rolled over [       ]
  - Other(s), please specify \_\_\_\_\_ [       ]
23. To what extent would you say you understand how finance providers evaluate business creditworthiness?

- a. Understand it very well [     ]
  - b. Quite well [     ]
  - c. Not very well [     ]
  - d. I don't know [     ]
24. When you applied for credit, did you use a recommendation?
- a. Yes (go to **Q25**) [     ]
  - b. No (go to **Q26**) [     ]
25. If **YES in Q24**, which type(s) of recommendation did you use? (You may choose **more than one.**)
- a. Family [     ]
  - b. Bank Staff / Loan officers [     ]
  - c. Local leader [     ]
  - d. Other(s), please specify \_\_\_\_\_ [     ]
26. Do you know about microfinance institution(s)?
- a. Yes [     ]
  - b. No [     ]
27. Is (Are) there any microfinance institution(s) in your township?
- a. Yes [     ]
  - b. No [     ]
28. Did you apply for a microcredit loan in the last 2 years?
- a. Yes (go to **SECTION 2**) [     ]
  - b. No (go to **SECTION 4**) [     ]

**SECTION 2: MICROCREDIT BORROWER**

*This section is only for respondents who borrowed microcredit.*

29. Which of the following microfinance institution(s) did you borrow from in the last 2 years? (You may choose **only one.**)
- a. Microcredit institution (e.g. AIM, TEKUN, YUM, Yayasan Pembangunan Usahawan Terengganu) [     ]
  - b. Commercial Bank (Maybank, CIMB, AmBank) [     ]
  - c. Development Financial institutions (SMEs Bank, BSN, Agro Bank) [     ]
  - d. Credit Cooperative [     ]
  - e. Other(s), please specify \_\_\_\_\_ [     ]
30. Why did you choose this (these) microfinance institution(s)? (You may choose **more than one.**)
- a. It was the regular financial institution for a microcredit loan [     ]
  - b. It was the only microcredit supplier in my area [     ]
  - c. Other credit suppliers would reject my application [     ]
  - d. This microcredit supplier offers the lowest interest rate [     ]
  - e. This microcredit supplier offers the best credit terms and conditions [     ]
  - f. Other(s), please specify \_\_\_\_\_ [     ]
31. How long have you been a borrower from your microfinance institution(s)?
- a. Less than 1 year [     ]
  - b. 1 to 2 years [     ]
  - c. 2 to 3 years [     ]
  - d. 3 to 4 years [     ]
  - e. Other(s), please specify \_\_\_\_\_
32. How many times have you borrowed from the microfinance institution(s) since 2014?

- a. Once [ ]
- b. Twice [ ]
- c. Three times [ ]
- d. More than three times [ ]
33. What is the maximum single amount of microcredit loan you can borrow from the microfinance institution(s)?
- a. Less than RM5,000 [ ]
- b. Between RM5,001 and RM10,000 [ ]
- c. Between RM10,001 and RM15,000 [ ]
- d. Between RM15,001 and RM20,000 [ ]
- e. Between RM20,000 and RM25,000 [ ]
- f. More than RM25,000 [ ]
34. What was the purpose for your microcredit loan? (You may choose **more than one**.)
- a. Improve business site [ ]
- b. Buy equipment, machines or tools [ ]
- c. Employ more workers [ ]
- d. Other(s), please specify \_\_\_\_\_ [ ]
35. What percentage did the microcredit loan make up of your total loan amount in 2014?  
\_\_\_\_\_ (%)
36. Was the microcredit loan adequate?
- a. Yes (go to **Q39**) [ ]      b. No (go to **Q37**) [ ]
37. If inadequate, did you borrow from other credit sources?
- a. Yes (go to **Q38**) [ ]      b. No (go to **Q39**) [ ]
38. If **YES in Q37**, where did you source your additional credit? (You may choose **more than one**.)
- a. Leasing/factoring [ ]
- b. Trade credit/suppliers [ ]
- c. Family and friends [ ]
- d. Pawnshop [ ]
- e. Private money lender [ ]
- f. Government fund and scheme [ ]
- g. Other(s), please specify \_\_\_\_\_ [ ]
39. Approximately, how far are you from the nearest microfinance institution in your township?
- a. less than 5 km [ ]
- b. between 5 km to 10 km [ ]
- c. between 10 km to 20 km [ ]
- d. more than 20 km [ ]
40. Why did you choose to apply for microcredit? (You may choose **more than one**.)
- a. No collateral [ ]
- b. Low interest rates [ ]
- c. Fast processing time [ ]
- d. Fast disbursement [ ]
- e. Minimal documentation [ ]

- f. Easy to access [       ]
- g. Not eligible for higher amount [       ]
- h. Processing cost is less expensive [       ]
- i. Other(s), please specify \_\_\_\_\_ [       ]

41. Did you have to make any informal payment (such as gifts or money for credit officials, etc.) to get the microcredit loan?

- a. Yes [       ]
- b. No [       ]

42. Did you receive any assistance from the government, credit officials, etc., in obtaining your microcredit loan?

- a. Yes [       ]
- b. No [       ]

43. With the microcredit loan, I am more optimistic about the future.

- a. Agree [       ]
- b. Disagree [       ]

44. Please circle the suitable number from 1 to 5, where 1 indicates “strongly disagree” and 5 indicates “strongly agree”.

	Strongly Disagree		Neutral		Strongly Agree
a. Microcredit helps me to develop and introduce new products or services.	1	2	3	4	5
b. Microcredit increases my business revenue and sales turnover.	1	2	3	4	5
c. Microcredit provides an opportunity to expand my business site.	1	2	3	4	5
d. With microcredit, I can employ more staff.	1	2	3	4	5
e. Microcredit helps me to buy new machinery, equipment and materials for my business.	1	2	3	4	5

45. How long did the microcredit bank takes to process your microcredit loan application? (The time from your application submitted until you received the loan)

- a. Less than a week [       ]
- b. 1 week [       ]
- c. 2 weeks [       ]
- d. 3 weeks [       ]
- e. 1 month [       ]
- f. More than a month [       ]

46. Did you get charged microcredit fees?

- a. Yes (go to **Q47**) [       ]
- b. No (go to **Q48**) [       ]

47. If **YES in Q46**, what kind of fees you were charged? (You may choose **more than one**.)

- a. Administrative or service fee [       ]
- b. Insurance fee [       ]
- c. Legal fee [       ]
- d. Other(s), please specify \_\_\_\_\_ [       ]

48. Compared with your business revenue without a microcredit loan, has your business revenue with microcredit in the last 2 years \_\_\_\_\_

- a. Increased (go to **Q50**) [       ]
- b. Remained the same (go to **Q50**) [       ]



c. Decreased (go to Q49) [ ]

49. If "**Decreased**" in Q48, what are the reasons? (You may choose more than one.)

- a. A fall in product price [ ]
- b. Increased competition [ ]
- c. Increased inflation [ ]
- d. Unexpected events (flood, drought) [ ]
- e. Other(s), please specify \_\_\_\_\_ [ ]

50. Compared with your fixed assets without a microcredit loan, have your fixed assets with microcredit in the past 2 years \_\_\_\_\_

- a. Increased (go to Q52) [ ]
- b. Remained the same (go to Q52) [ ]
- c. Decreased (go to Q51) [ ]

51. If "**Decreased**" in Q50, what are the reasons? (You may choose more than one.)

- a. Liquidated some fixed assets [ ]
- b. Depreciation in business tools and equipment [ ]
- c. Poor business profit [ ]
- d. Natural disaster (flood, drought) [ ]
- e. Other(s), please specify \_\_\_\_\_ [ ]

52. Compared with the number of full time employees without a microcredit loan, has the number of full time employees with a microcredit loan in the past 2 years \_\_\_\_\_

- a. Increased (go to SECTION 4) [ ]
- b. Remained the same (go to SECTION 4) [ ]
- c. Decreased (go to Q53) [ ]

53. If "**Decreased**" or "**Remained the same**" in Q52, what are the reasons? (You may choose more than one.)

- a. Existing workers already adequate [ ]
- b. Labour cost is high [ ]
- c. Hard to find workers [ ]
- d. Poor business profit [ ]
- e. Other(s), please specify \_\_\_\_\_ [ ]

**NOW, PLEASE GO TO SECTION 4**

**SECTION 3: NON-BORROWER**

*This section is to be completed only by respondents who did not borrow any loan in 2014.*

54. If **NO** in Section 1 Q3, please indicate the reason(s) (You may choose more than one.)

- a. Do not qualify for financing [ ]
- b. Do not like to be in debt [ ]
- c. Received financial assistance from the government [ ]
- d. Loan processing time too long [ ]
- e. Too many required documents to submit [ ]
- f. Insufficient knowledge of financial product availability [ ]
- g. Lack of collateral [ ]

- h. Interest rate was not affordable [     ]
- i. Have enough funding [     ]
- j. Others (please specify) \_\_\_\_\_ [     ]

55. Do you have any intention to borrow in the future?

- a. Yes (go to **Q56**) [     ]
- b. No (go to **SECTION 4**) [     ]

56. If **YES in Q55**, from which source do you intend to borrow? (You may choose **more than one**.)

FORMAL SOURCES		INFORMAL SOURCES	
a. Commercial bank (e.g. Maybank, CIMB, AmBank)	[     ]	a. Family and friends	[     ]
b. Development financial institutions (e.g. BSN, SME Bank, Agro Bank)	[     ]	b. Private money lender	[     ]
c. Microfinance institutions (e.g. AIM, TEKUN, YUM, Yayasan Pembangunan Usahawan)	[     ]	c. Trade credit	[     ]
d. Government assistance	[     ]	d. Other(s), please specify _____	[     ]
e. Credit Cooperative	[     ]		

#### SECTION 4: CHARACTERISTICS OF THE BUSINESS

*This section is to be completed by ALL RESPONDENTS.*

57. When did you establish your business? \_\_\_\_\_(year)

58. What was the total number of employees **when you started** your business?  
\_\_\_\_\_person(s)

59. What type of ownership would you consider your business?

- a. Household business establishment [     ]
- b. Private (sole proprietorship) [     ]
- c. Collective/Cooperative [     ]
- d. Limited liability company [     ]
- e. Joint stock company with state capital [     ]
- f. Joint stock company without state capital [     ]
- g. State enterprise (central) [     ]
- h. State enterprise (local) [     ]

60. In which sector is your business involved?

- a. Manufacturing [     ]
- b. Service [     ]
- c. Agriculture based [     ]
- d. Wholesale and retail [     ]
- e. Other(s) (please specify) \_\_\_\_\_ [     ]

61. Please indicate your annual sales turnover, total revenue and number of full time workers (**estimate only**).

	Year 2013	Year 2014
Annual Sales Turnover (RM)		
Total revenue (RM)		
Full time workers		

62. What is your monthly business revenue? \_\_\_\_\_ (RM)

63. Please indicate your total business capital expenditure (RM).

	Building	Machinery and equipment	Furniture and office equipment	Commercial vehicle (lorries, vans, etc.)
2013				
2014				

64. Does your business have: (You may choose **more than one**.)

- a. An accounting book [       ]
- b. Tax code [       ]
- c. A written business plan when you started your business [       ]
- d. Direct exports [       ]
- e. Other(s) (please specify) \_\_\_\_\_ [       ]

65. For the following factors important to your business in choosing creditors, please circle the suitable number from 1 to 5 where 1 indicates “strongly disagree” and 5 indicates “strongly agree”.

	Strongly disagree		Neutral		Strongly agree
No collateral required	1	2	3	4	5
Lower interest-rate	1	2	3	4	5
Immediate loan release/faster processing	1	2	3	4	5
Having a borrowing relationship with the creditor	1	2	3	4	5
No/less complicated lending procedure	1	2	3	4	5
Better lending terms	1	2	3	4	5
Other(s), please specify _____	1	2	3	4	5

66. Please circle the number [from 1 to 5] that best describes the extent to which your business has utilized personal ties, networks and connections **in 2014 operations**, where 1 indicates “very little” and 5 indicates “very extensive”. NA indicates, “I don’t know”.

	Very little		Average		Very extensive	NA
Commercial bank officials	1	2	3	4	5	0
Community leaders	1	2	3	4	5	0
Government officials	1	2	3	4	5	0
Suppliers (e.g., input suppliers, material suppliers, etc.)	1	2	3	4	5	0
Customers	1	2	3	4	5	0
Friends, relatives	1	2	3	4	5	0
Social organizations or NGOs	1	2	3	4	5	0
Microfinance organizations	1	2	3	4	5	0
Business associations	1	2	3	4	5	0

**SECTION 5: SOCIO-ECONOMIC CHARACTERISTICS OF OWNER/MANAGER**

*This section is to be completed by ALL RESPONDENTS.*

67. What is your gender?

- a. Male [       ]  
 b. Female [       ]

68. To which age group do you belong?

- a. 18-25 years old [       ]  
 b. 26-35 years old [       ]  
 c. 36-45 years old [       ]  
 d. 46-55 years old [       ]  
 e. Over 55 years old [       ]

69. What is your marital status?

- a. Single/never married [       ]  
 b. Married [       ]  
 c. De-facto relationship [       ]  
 d. Divorced/separated [       ]

70. To which ethnic group do you belong?

- a. Malay [       ]  
 b. Chinese [       ]  
 c. Indian [       ]  
 d. Kadazan [       ]  
 e. Other(s), please specify \_\_\_\_\_ [       ]

71. What is your highest educational or professional qualification?

- a. Never went to school [       ]  
 b. Primary school [       ]  
 c. High school (SRP/PMR/SPM/STPM) [       ]  
 d. Diploma/vocational [       ]  
 e. Bachelor Degree [       ]  
 f. Master Degree [       ]

- g. PhD [ ]
- h. Other(s), please specify\_\_\_\_\_ [ ]

72. How many members are there in your household?

- a. 2 [ ]
- b. 3 [ ]
- c. 4 [ ]
- d. 5 [ ]
- e. More than 5 [ ]

73. How many income earner(s) are in your household?

- a. 1 [ ]
- b. 2 [ ]
- c. 3 [ ]
- d. 4 [ ]
- e. More than 4 [ ]

74. What is your household's average monthly income?

- a. Less than RM1,000 [ ]
- b. Between RM1,001 and RM2,000 [ ]
- c. Between RM2,001 and RM3,000 [ ]
- d. Between RM3,001 and RM4,000 [ ]
- e. More than RM4,000 [ ]

75. Is your business the main source of income for your household?

- a. Yes (go to **Q77**) [ ]
- b. No (go to **Q76**) [ ]

76. If **NO in Q75**, what is the main source of your household income?

- a. Salary from paid jobs [ ]
- b. Pension [ ]
- c. Returns from investment (e.g., property, stocks, bonds, gold, etc.) [ ]
- d. Other(s), please specify\_\_\_\_\_ [ ]

77. Did you have any work/business experience before running your present business?

- a. Yes (go to **Q78**) [ ]
- b. No (go to **Q81**) [ ]

78. Do you have experience as.....(You may choose **more than one**.)

- a. Owner [ ]
- b. Employee [ ]
- c. Other(s), please specify\_\_\_\_\_ [ ]

79. Do you have experience in.....(You may choose **more than one**.)

- a. Local private firm [ ]
- b. Government service [ ]
- c. Government-Linked Company (GLC) [ ]
- d. Multinational corporation [ ]
- e. Other(s), please specify\_\_\_\_\_ [ ]

80. What was your length of service for **Q78**?

- a. Less than 5 years [ ]
- b. 5 to 9 years [ ]

- c. 10 to 14 years [     ]
- d. 15 to 19 years [     ]
- e. More than 20 years [     ]

81. How many years have you been operating your business?

- a. Less than 5 years [     ]
- b. 5 to 9 years [     ]
- c. 10 to 14 years [     ]
- d. 15 to 19 years [     ]
- e. More than 20 years [     ]

82. Have you ever taken any of the following training courses? (You may choose **more than one.**)

- a. Business management skills [     ]
- b. Leadership skills [     ]
- c. Accounting/financial management [     ]
- d. Human resource management [     ]
- e. Marketing [     ]
- f. Other(s), please specify [     ]

*“Thank you for your time, your participation in this survey is greatly appreciated. I will collect the form in two days. If you have further comments about my research, please feel free to comment in the space provided below. Once again, we assure you that your identity will remain STRICTLY CONFIDENTIAL.”*

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