

INTER-FIRM LINKAGES, CREDITWORTHINESS AND  
ACCESS TO FINANCE IN MALAYSIAN MANUFACTURING  
SMALL MEDIUM ENTERPRISES

NABILA M.NURDIN

MASTER OF PHILOSOPHY

MULTIMEDIA UNIVERSITY

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FINANCE IN MALAYSIAN  
MANUFACTURING SMALL MEDIUM  
ENTERPRISES

BY

NABILA M.NURDIN

B. Financial Engineering. (Hons), Multimedia University

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## DECLARATION

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**Nabila M.Nuridin**

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## DEDICATIONS

A dedication to my  
family members,  
supervisor, co-supervisors  
&  
fellow GRA friends  
for their unconditional support throughout the period.

## ABSTRACT

SMEs, particularly in the manufacturing industry, reportedly face difficulties in accessing funds to finance their capital expenditure and working capital. The various challenges that SMEs face in their access to finance could be eased via the capital market, government financial support and inter-firm linkages. Unlike SMEs in the technology or services industry, manufacturing SME are less likely to gain from the startup funds such as equity crowdfunding, angel investing, or venture capital. In year 2015, only 15.4% out of RM 71.9 billion financing was channelled to manufacturing SME, compared to 61% channelled to SMEs in the services sector. SMEs are also told not be too dependent on government loans and instead improve their creditworthiness.

This study aims to explore the roles of inter-firm linkages and their influence on improving SME access to finance and its creditworthiness (measured by 5C's of credit). For Malaysia, a majority (93.8%) of the companies in the manufacturing sector are SMEs and they contribute to the total Malaysian GDP thus this study will bring significant contribution to the body of knowledge with regards to SME's access to finance.

This study uses quantitative analysis and Partial Least Squared (PLS) method was employed as the statistical tool to analyze the data. PLS-SEM multigroup analysis (PLS-MGA) was used to analyze the moderating effect of the model path. SPSS software was required only in complimenting for Exploratory Factor Analysis (EFA) while SmartPLS was the main software used for the entire data analysis. Pencil and papers questionnaire were distributed and collected by hand due to the low email usage among manufacturing SMEs.

The result shows that there is a significant relationship between SME creditworthiness and its access to finance. Thus, SMEs should improve their creditworthiness in order to improve their access to finance. It is also found that there



is a significant relationship between an SME's borrowing character and its access to finance while the relationships between its capacity, capital, collateral and condition with access to finance are not found to be significant. SMEs are advised to focus on building good borrowing character to signal their good borrowing image (i.e. good historical repayment) to financial providers in order to improve their access to finance. The moderating role of inter-firm linkages towards the relationship between creditworthiness and access to finance is also found to be insignificant.

When running analysis on the group of SME with linkage to large firms, it is found that there is a significant negative relationship between collateral and access to finance but the relationship between collateral and access to finance is not significant for SMEs without linkage. Inter-firm linkages are found to play a significant role in moderating the relationship between an SME's collateral and its access to finance. Interfirm linkages strengthen the relationship between collateral and access to finance. SMEs with linkage have higher build-up collateral which puts them at a disadvantage as they are locked-in by their house bank, have reduced power of renegotiation, and are restricted from dealing with other lenders.

Interfirm linkages are also found to significantly moderate the relationship between condition and access to finance. When running analysis for SMEs without linkage, the relationship between condition and access to finance is found to be significant. However, the relationship between condition and access to finance is not significant for SMEs without linkage. It shows that inter-firm linkages reduce the importance of business condition for the banks to grant finance to the SME with links to large firms. SMEs without linkage are highly exposed to business risk while SMEs with linkage are less affected by the business condition. Among those without linkage, those with better business condition get better access to finance due to the lower probability of default which the borrower is willing to undertake which results in external credit becoming less expensive

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## LIST OF ABBREVIATIONS

ADFIAP	Association of Development Financing Institutions in Asia and the Pacific
AMOS	Analysis of Moments Structures
AVE	Average Variance Extracted
BEF	Business Excellence Framework
CBSEM	Covariance Based Structural Equation Modelling
CEO	Chief Executive Officer
CGC	Credit Guarantee Corporation Malaysia Bhd
CSR	Corporate Social Responsibility
EFA	Explanatory Factor Analysis
FMM	Federation of Malaysian Manufacturer
GDP	Gross Domestic Product
GLC	Government-Linked Companies
GLIC	Government-Linked Investment Companies
HR	Human Resource
ISIC	International Standard Industrial Classification
ISO	International Organization for Standardization
JPPPV	Jawatankuasa Penyelarasan dan Pembangunan Program Vendor
KMO	Kaiser-Meyear-Olkin Measure of Sampling Adequacy
MC	Multicollinearity
MITI	Ministry of International Trade and Industry
MMU	Multimedia University
MNC	Multinational Companies
MoF	Ministry of Finance
MoU	Memorandum of Understanding
MPPPV	Majlis Perundingan Program Pembangunan Vendor
NFI	Normed Fit Index
PCA	Principal Component Analysis
PLS	Partial Least Square
PLS-MGA	Partial Least Squares-Multi-Group Analysis

PLS-SEM	Partial Least Square-Structural Equation Modelling
R&D	Research & Development
RBT	Resource-Based Theory
RMStheta	Root Mean Square error correlation
RNT	Relational Network Theory
SCORE	SME Competitive Rating for Enhancement
SEM	Structural Equation Modelling
SmartPLS	Smart Partial Least Squares
SME	Small and Medium Enterprises
SRMR	Standardized Root Mean Square Residual
UK	United Kingdom
US	United States of America
VDP	Vendor Development Programme
VIF	Variance Inflation Factor



## CHAPTER 1

### INTRODUCTION

This chapter serves as the introduction to the research. It starts with the research background which discusses the definition of small and medium enterprises (SMEs), their contributions, and the various challenges faced by these SMEs. The chapter also discusses inter-firm linkages in Malaysia, the problem statement, research objectives and research questions, scope of research, contribution of the study, and definition of important concepts. This chapter ends with the conclusion and organisation of the chapters.

#### 1.1 Research Background

This section starts by discussing the roles and contributions of SMEs. This is followed by a discussion of the unique characteristics of SMEs and the challenges they face. Finally, the effect of inter-firm linkages towards an SME's access to finance is discussed.

##### 1.1.1 SME Definition & Contribution

According to SME Information website, small and medium enterprises (SME) are identified and categorised by the number of full time employees or annual sales turnover. The categorisation differs depending on the type of industry. The Table 1.1 summarises the definition of SME which is based on the latest SME definition endorsed in July 2013 (Department of Statistics Malaysia, 2017).

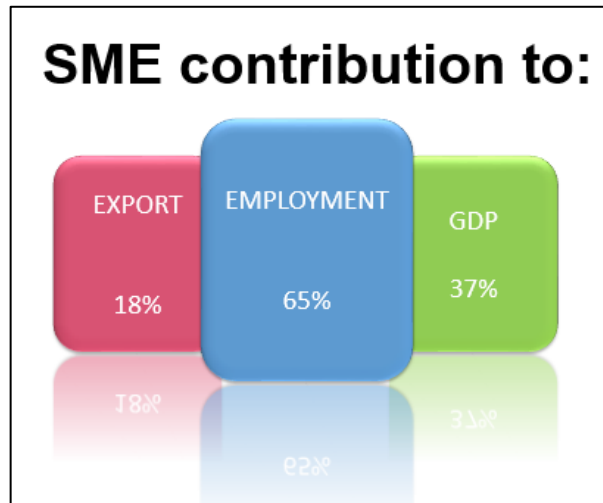
**Table 1.1:** Definition of SME

	<b>Manufacturing</b>	<b>Services</b>
Micro	Less than 5 full time employees OR less than RM300,000 sales turnover	Less than 5 full time employees OR less than RM300,000 sales turnover
Small	Between 5 & 75 full time employees OR between RM300,000 and less than RM15 mil sales turnover	Between 5 & 30 full time employees OR between RM300,000 and less than RM3 mil sales turnover
Medium	Between 75 & 200 full time employees OR between RM15 mil and less than RM50 mil sales turnover	Between 30 & 70 full time employees OR between RM3 mil and less than RM20 mil sales turnover

Micro-enterprises are defined as enterprises that have sales turnover less than RM 300,000 or having less than 5 employees for both the manufacturing as well as the services sector. Small enterprises on the other hand, are defined as enterprises that have between RM 300,000 to RM15 million of sales turnover or having 5 to 75 full time employees for the manufacturing industry. In contrast, medium enterprises are defined as having between RM15 million to RM50 million of sales turnover or having 75 to 200 full time employees for the manufacturing services. As for the service sector, small enterprises are defined as enterprises that have between RM300,000 to RM3 million of sales turnover or having between 5 to 30 full time employees. As for the service sector, medium enterprises are defined as enterprises having RM3 million to RM20 million in sales turnover or having 30 to 70 full time employees.

SMEs contribute tremendously to a country's growth; hence, their importance cannot be ignored. Their contribution can be seen from different perspectives. Essentially, they are the back bone of a country's economy.

The significant role of the Malaysian SME in the economy can be demonstrated by their contribution to the country's GDP, employment and total export. Currently, 98.5% of business establishments in Malaysia are SMEs and their contribution to the country's GDP amounts to 36.6% and 65.3% to the country's employment (SME Corp. Malaysia, 2017). In addition, SME contribution to total export is nearly 18% as shown in Figure 1.1.



**Figure 1.1:** SME contribution to Export, Employment & GDP

Source: Bernama (2017)

SMEs also help bring healthier competition to the market (Hamzah, 2011) in terms of price, efficiency, design and through checks on market powers or monopolisation (Sahin, Todiras & Nijkamp, 2012). Since most large enterprises are inclined to drive up the prices of their products in order to increase their profit margin (Wong & Aspinwall, 2004), SMEs help stabilise the market. The existence of many SMEs in an industry encourages healthy competition and may be viewed as a desirable protection of the capitalistic system (Hamzah, 2011; Longenecker et al., 2005).

From the market point of view, SMEs contribute to the market by supplying input/parts and serving the niche market. SMEs tend to play the role of suppliers to large enterprises. They supply components, parts, and subassemblies and are subcontractors (Hashim & Wafa, 2002; Kuan & Helper, 2016). Past studies find that linkages between local SMEs and multinational companies (MNC) provide more

business for local firms (Li, De Souza, & Goh, 2016). This occurs as large firms outsource their tools, components parts, equipment as well as their services such as assistance, maintenance, upgrades of the technical abilities to the local SMEs. Through this role, SMEs actually act as the foundation of the manufacturing industry that supports the success of large enterprises (Wong & Aspinwall, 2004).

In addition to their role as the large firm's supplier and outsource agent, SMEs also tend to operate in specified and niche markets which are not practical for larger enterprises to enter (Wong & Aspinwall, 2004). Hence, they are able to provide something marginally different from the standard products produced by the large firms (Hashim & Wafa, 2002; Storey, 2016). Their agility and flexibility means that they also have the tendency to be able to switch their production of products and services readily in the face of changing demands within their field and capacity (Wadhwa, 2012). For example, a number of attempts from large firms to automate production processes or mass production of furniture products (which is known to be SMEs' dominant industry) often end with bail out or consolidations as analyst pointed out that these are due to the fact that furniture is an industry of niches. The very nature of furniture consumption is a deeply personal statement of the client's taste and personality which is rather labour intensive and labour productive and have led to some of the companies with big names pulling out of the business (Maskell, 1998).

Thus, an SME's economic, social and market contributions are unquestionable. SMEs provide job opportunities, employment growth and growth in output and value-added products and services. They also support other firms' operations by supplying parts and input, and outsource the operations of larger firms and supplement varieties of products to serve the niche markets. However, despite their numerous contributions to the country, SMEs, specifically in developing countries, face numerous challenges which hinder their growth and affect their survival. In order to understand these challenges, it is important to understand their characteristics that may contribute to these challenges.

### 1.1.2 Financial Challenges Faced by SMEs

Finance is crucial to an SME as it is not just a driver of a firm's growth but has influence on most of the key challenges faced by an SME (SME Corp. Malaysia, 2012). Therefore, financial challenges faced by SMEs are critical. In fact, according to the World Bank Productivity & Investment Climate survey, access to finance is among the key challenges faced by an SME, aside from innovation and technology adoption, its human capital development, its market access, its infrastructure, and its legal and regulatory environment. Difficulties in accessing finance should not be underestimated as it can lead to more serious and challenging issues that can harm the SME's sustainability and growth, illustrated in Figure 1.2.



**Figure 1.2:** Key Challenges of SMEs

Source: SME Corp. Malaysia (2012)

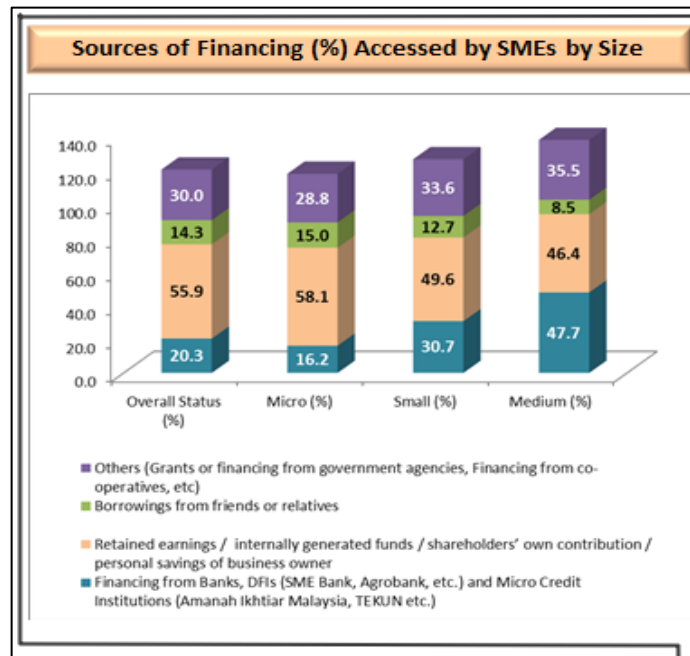
Malaysian firms mostly rely on bank loans (52%) and own funds (48%), followed by government (18%), corporate credit (12%), venture capital (8%), family and friends (8%) and others (9%), as shown in Figure 1.3.



**Figure 1.3:** Malaysian firms’ means of financing.

Source: Fintechnews Singapore (2015)

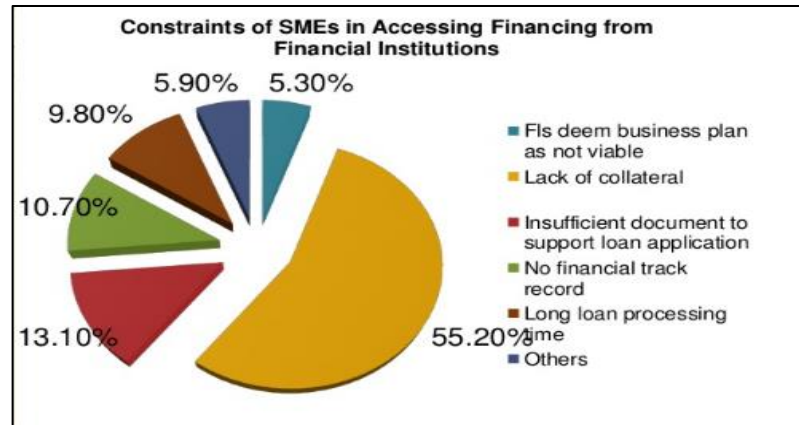
However, Malaysian SMEs are reported to face constraints in accessing finance where overall, 55.9% of their source of funds is from internal funds or shareholders, 14.3% from family and friends, and only 20.3% from microcredits, banks and financial institutions as shown in Figure 1.4.



**Figure 1.4:** SMEs’ access to finance

Source: SME Corp. Malaysia (2012)

Overall, SMEs are reported to face difficulties in accessing finance due to a number of reasons. It is reported that 55.2% of them lack collateral, 13.2% have insufficient documents to support loan application, 10.7% have no financial record, 9.8% were reported to have long loan processing time, and 5.3% were told that their business plan is deemed not viable by Financial Institutions (FIs) as shown by Figure 1.5.



**Figure 1.5:** Constraints of SMEs in Accessing Financing from Financial Institutions.

Source: The Census of Establishment and Enterprise (2005),  
Department of Statistic Malaysia.

SMEs are urged to improve their creditworthiness and bankability to enable them to secure favourable financing and credit terms (ADFIAP, 2017). Credit evaluation is not simply an instrument for minimizing risks, but is also evolving into an instrument for identifying opportunities and building trust (Čančer & Knez-Riedl, 2005). This is supported by Lezgovko & Jakovlev (2017) as the study shows that the companies evaluating partners' and their own creditworthiness have 10% higher three last year revenues and growth in the number of employees. Credit evaluation enables SMEs to place confidence and trust among business partners which is very important since SME are confronted with several difficulties when it comes to transmitting the strength of their creditworthiness to the public in order to access financing such as loans and leasing because of their size (Lezgovko & Jakovlev, 2017). Due to their size

and opaque nature, it inspires mistrust and prejudice on the part of other business partners (Lezgovko & Jakovlev, 2017).

## 1.2 Inter-firm Linkages in Malaysia

The various challenges that SMEs face in their access to finance could be eased via the capital market (Ziyu, 2014), government financial support (SME Corporation Malaysia, 2011), and inter-firm linkages (Navas-Alemán, Pietrobelli, & Kamiya, 2012). Although the capital market can enable firms to raise funds and ease their financial needs, it is quite complex and expensive, it requires time consuming preparations and is laden with a number of restrictions and requirements (Ziyu, 2014). Firms which use the capital market to raise funds are also exposed to risk as the owner may have to face possible dilution when he/she is unable to cover the firm's liabilities (Ziyu, 2014). Apart from that, the capital market can affect the direction of the company as more and more people get themselves involved with the company when they become the shareholders.

In Malaysia, various government agencies provide financial assistance to SMEs such as Bank Pembangunan Malaysia Berhad (BPMB), Amanah Ikhtiar Malaysia (AIM), Export-Import Bank Malaysia Berhad (EXIM Bank), Malaysia Debt Ventures Berhad (MDV), Malaysian Venture Capital Management (MAVCAP) and Tabung Ekonomi Kumpulan Usaha Niaga (TEKUN) (SME Corporation Malaysia, 2011). SMEs may apply for microfinance or loans from these agencies to help with their financing needs in order to grow their businesses. However, census by the Department of Statistics shows that only about 20% of financing comes from financial institutions and government loans due to the various constraints faced by these SMEs, such as the inability to provide collateral, insufficient documents to support loan application, no financial track record and so on, as these financing schemes are mostly available via soft loans from various banking and non-banking financial institutions and venture capitalists. Therefore, SMEs need alternative support and sources of financing.



Horizontal and vertical inter-firm linkages are now very common, with SMEs increasingly linking themselves to larger firms to expand their market access and large firms finding it advantageous to fragment their activities into a chain of many functions that are carried out by these SMEs. Inter-firm linkages between SMEs and large firms (as their mentors or customers) provide opportunities to facilitate financial flows to SMEs via two mechanisms: 1) trade finance on materials and machinery acquisitions which large firms can offer to the SMEs; 2) SMEs capacity to obtain credit is strengthened due to their link with large firms either due to reputational effects or through reduction in information asymmetry about the SMEs financial situation (Navas-Alemán, Pietrobelli, & Kamiya, 2015). Inter-firm linkages may therefore provide an opportunity for improved access to financing for SMEs.

Understanding the importance of inter-firm linkages, the government of Malaysia has put in a lot of effort to help develop the local SMEs through linkages with GLCs/MNCs and large firms. Programmes such as GoEx Programme, Business Accelerator Programme, SME Outreach Programme, Industrial Linkage Programme and Vendor Development Programme were established and implemented to facilitate close linkage between SMEs, academic institutions, MNCs/GLCs as well as large firms. At first, focus was given to 5 industrial sectors which were the automotive, electrical & electronics, rubber, plastics, and light engineering. The programmes aim at creating and developing successful entrepreneurs in the manufacturing and services sectors to compete in the global market. Permodalan Nasional Berhad (PROTON) is among the first large firm that participated in the task of developing the Malaysian SMEs in the automotive sector. Many parties have been involved and have taken interest to participate in the programme such as the local SMEs, Government-Linked companies, Multi-National companies (MNC), financial institutions, as well as government agencies.

Large firms, mainly Government-Linked companies (GLC), Government-Linked Investment companies (GLIC), and Multi-National companies (MNC), are working together with financial institutions to help identify bankable local vendors

(SMEs). They also outsource components of their production to the SMEs and provide a platform to penetrate the international market. The government agencies help monitor the firm's performance, ensure that the requirements of product quality are met and help identify future outlook, and improvise operational activities. They also help in developing human capital via training and cost sharing for trainings. Technical guidance and advisory are also given. All these will ensure that the SMEs have updated financial records, cash flows as well as good business plan with sound marketing and management plans. The government agencies also help provide financing packages and financial advisory, providing facilities, technical knowledge and training, research and development (R&D), and product development as well, aside from providing marketing and promotional facilities through the government agencies. There are a few bodies created to monitor and coordinate these programmes such as Majlis Perundingan Program Pembangunan Vendor (MPPPV) and Jawatankuasa Penyelarasan dan Pembangunan Program Vendor (JPPPV) while the performance of the companies is analysed using Business Excellence Framework (BEF), SME Competitive Rating for Enhancement (SCORE), or Key Performance Indicator of Chief Executive Officer in Government-Linked Companies (KPI CEO GLC).

To encourage more large firms to participate, further government initiatives include incentives given to the large firms after they have signed the memorandum of understanding (MoU). They may claim operational expenses related to product development such as cost in R&D and quality enhancement, cost in certification (for example, International Organization for Standardization (ISO), cost involving human capital development, training, and cost involving financial systems and management systems up to RM300,000 per year.

The SMEs participating in some of the programmes not only have a buyer-seller relationship with the large firms that they are supplying to, but they also need to put in more effort and commitment to maintain the linkage as the programmes aim to build long term mentor-mentee relationships to ensure the success of the programmes and to ensure all parties benefit from it.

### 1.3 Problem Statement

SME financing is a crucial issue as finance is one of the most important drivers of a firm's growth. However, due to their opaque nature and the high levels of information asymmetry, SMEs face various challenges in accessing to funds from the capital market. Not all SMEs apply for loans simply because they either do not require any financing due to the availability and sufficiency of retained earnings (Serrasqueiro & Nunes, 2012) or do not like to be in debt due to certain factors such as religion (Wahab & Abdesamed, 2012), or they prefer other financial structures such as equity (Dwyer & Kotey, 2015; Xiang & Worthington, 2015). SMEs that have been applying for loans but were rejected by the banks cite that the key reason was due to being incompetent to meet the conditions imposed by the banks. These include having high leverage or outstanding loans and failing to provide appropriate documentation (SME Corp Malaysia, 2012).

The Government of Malaysia has provided a lot of initiatives to assist SMEs, ranging from financial assistance, advisory, technical knowledge and facilities under its governmental agencies and corporations such as the Ministry of Finance (MoF), Ministry of International Trade and Industry (MITI), Credit Guarantee Corporation Malaysia Bhd (CGC), SME Bank and SME Corporation. However, SMEs are not able to fully tap into these funds. The government of Malaysia via CGC targeted RM14.5 billion of SME loan base by 2020. However, SME loans currently stand at RM9 billion. CGC also aims to achieve 50% graduation rate. However, the current graduation rate is 47%, which means 18,000 SMEs no longer require guaranteed loans from CGC. Despite the vast amount of financing available for these SME, the funds have been channelled via banks; thus, the banks have the final say as to whether they want to approve or reject the SME loan application. Some banks contribute towards the CGC scheme such as Maybank, OCBC Bank and SME Bank (Puspadevi, 2016) while some are quite strict when giving out business loans.

SME's inability to access financing is often associated with inadequate collateral and lack of proper financial track record (Dailyexpress, 2015). SMEs also need help to improve their creditworthiness and bankability to enable them to secure favourable financing and credit terms (ADFIAP, 2017). Apart from challenges in accessing finance, SMEs are most likely to suffer from other challenges, such as high cost of borrowing, high bank charges and fees, high legal documentation fees, and other charges imposed by the banks (Wanjohi & Mugure, 2008). It is also suggested that too much documentation required by the banks may demotivate SMEs from applying for external finance (Hassan et al., 2010). This can be seen as the reason why small businesses have the tendency to seek out illegal financiers (so called Ah Long or loan sharks) for financial assistance as they do not require many documentations; thus, the SMEs are able to get the money quickly (shorter approval and processing time). Cheap loans (ranging from RM1,000 to RM10,000) are made available to the small business via these loan sharks (Benjamin, 2016) but with interest rates as high as 18% or more, with some being compounded daily. Yet, small businesses agree to these terms, and this can be taken as an indication of their desperate need for financing.

Apart from this, new firms are reported to face greater difficulties in acquiring finance (Banerjee, 2014). This is supported by Pickernell et al. (2013) that young firms are less able to access public procurement. This is perhaps due to the relatively small number of customers, scarce earnings, and immaterial assets (Jensen, 2015; Renko et al., 2016) which translate as poor or not being credit worthy by the banks. A study from Hadlock & Pierce (2010) clearly indicates that as young and small firms grow, financial constraints tend to diminish.

With all the problems faced by SMEs in accessing finance, Malaysia may not be able to achieve the targets set by CGC, which is to have a RM14.5 billion SME loan base by 2020. A possible solution to improve the access to finance for SMEs as suggested in past literature is via inter-firm linkages between the SMEs and large established firms. The Malaysian government has put a lot of effort in programmes that link SMEs with other larger firms (SME Corp. Malaysia, 2014; Hamid, 2003), be it Government-Linked companies (GLC), Multi-National companies (MNC),

Government-Linked Investment companies (GLIC). Large firms themselves also have initiated their own linking programmes with the local SMEs as they realize the importance of SMEs as the driver of economic growth. Some of these large firms, namely Telekom, Petronas, Nestle, Proton, Perodua and many more have taken the calling seriously by taking local SMEs under their wing as their suppliers and helping to support and develop them.

These large firms intend to help local SMEs by providing a platform for the SMEs to penetrate the international market, helping in developing SME human capital via training, identifying the SMEs' future outlook, providing technical guidance and advisory, ensuring that the quality of SMEs' products meet the requirements, improving operational activities as well as monitoring the SMEs' performance (SME Corp. Malaysia, 2014). Linkages between an SME and large firms may have a role in facilitating the SME in accessing external finance either directly (via group lending, giving out corporate loans and becoming the loan guarantor) or indirectly (monitoring SMEs' performance and improving SMEs' creditworthiness). This study therefore aims to investigate the role of inter-firm linkages on SMEs' creditworthiness and access to finance.

This study therefore identified the following problem:

**SMEs require financing but they are facing difficulties in accessing external finance from the legal sources of funds such as financial institutions.**

Thus, the study proposes the possible role of inter-firm linkages in easing SMEs' access to finance through its influence on SME creditworthiness.

#### **1.4 Research Objectives & Research Questions**

Based on the problem statement in the above discussion, the main aim is identified as follows:

**To investigate the role of linkages between large firms and SMEs in influencing SMEs' access to finance.**

In an attempt to understand how inter-firm linkages between SMEs and large firms are influencing SMEs' access to finance, it beckons the following questions.

Research Question 1:

**Is there a relationship between an SME's creditworthiness and its access to finance?**

Research Question 2:

**How does each dimension of an SME's creditworthiness namely its capacity, capital, character, collateral and condition affect its access to finance?**

Research Question 3:

**Does inter-firm linkage (between an SME and large firms) have a moderating effect on the relationship between an SME's creditworthiness and its access to finance?**

The research objectives are as follows:

- 1- To explore the relationship between an SME's creditworthiness and its access to finance from the Malaysian manufacturing SME's point of view.**
- 2- To explore the relationship between the dimensions of creditworthiness, namely capacity, capital, character, collateral and condition and an SME's access to finance.**
- 3- To explore if inter-firm linkages moderate the relationship between an SME's creditworthiness and its access to finance.**

## 1.5 Scope of Research

As discussed previously, SMEs have contributed tremendously to the country's economic growth, and has played a vital role as the mover of economic growth in addition to making social contributions in this country. Given the contribution and roles of SMEs listed above, this research focuses on the Malaysian SMEs operating in the manufacturing industry and whether they have linkage or otherwise to large firms. This study sought to examine the effect of inter-firm linkages on the manufacturing SMEs, particularly in their access to finance and creditworthiness.

SMEs in the manufacturing sector have recorded a growth of 4.8 per cent (2015: 6.0%) in value-added and this was led by the Food, Beverages and Tobacco sub-sectors which increased 2.8 per cent (2015: 2.6%). Petroleum, Chemical, Rubber & Plastic Products moderated to 5.4 percent (2015: 6.1%) due to Chemicals and Rubber products while Non-Metallic Mineral Products, Basic Metal & Fabricated Metal Products registered at 6.2 percent from 7.5 per cent in 2015 (Department of Statistics Malaysia, 2017). The services and manufacturing sectors maintained their stronghold as the prominent economic activities in Malaysia for both SME GDP and Malaysian GDP. The combined share from the two sectors represent more than 70 per cent of the economy (Department of Statistics Malaysia, 2017).

This study has categorised the manufacturing industry into 23 categories based on the International Standard Industrial Classification (ISIC) which is used internationally. It has also been in use by the Federation of Malaysian Manufacturer (FMM) in their directories. The categories are provided in Table 1.2.

**Table 1.2:** Manufacturing Industry Classification

<b>Code</b>	<b>Classification</b>
1	Food products and beverages
2	Tobacco products
3	Textiles
4	Wearing apparel; dressing and dyeing of fur
5	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness & footwear
6	Wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
7	Paper and paper products
8	Publishing, printing and reproduction of recorded media
9	Coke, refined petroleum products and nuclear fuel
10	Chemicals and chemical products
11	Rubber and plastic products
12	Other non-metallic mineral products
13	Basic metal
14	Fabricated metal products, except machinery and equipment
15	Machinery and equipment N.E.C.
16	Office, accounting and computing machinery
17	Electrical machinery and apparatus N.E.C.
18	Radio, television and communication equipment and apparatus
19	Medical, precision and optical instruments, watches and clocks
20	Motor vehicles, trailers and semi-trailers
21	Other transport equipment
22	Manufacture of furniture, manufacturing N.E.C.
23	Recycling

Focus is given to the SMEs in the manufacturing industry because aside from the importance of this sector to the Malaysian economy, SMEs in this industry need funds for capital expenditure and working capital (Tagoe, Nyarko, & Anuwa-Amarh, (2005). Apart from that, SMEs in the manufacturing industry constitute the second



largest industry with 7.8% (SME Corp. Malaysia, 2015) of SME establishments belonging to the manufacturing industry. Additionally, 93.8% of the companies in the manufacturing sectors are SMEs and they contribute 23% of total Malaysian GDP (Hoq, Ha, & Said, 2009; SME Corp. Malaysia, 2015). However, during the year 2015, a total of RM71.9 billion in financing was approved to 128,924 SMEs by financial institutions. A huge bulk of the financing was channelled to the services sector (61% or RM167.5 billion), as compared to manufacturing sector which only received 15.4% or RM42.4 billion (SME Corp. Malaysia, 2016). For an industry mostly dominated by SMEs, there is need to conduct studies on this group of SMEs.

After the scope of this study has been established, the study discusses the significance of this study in the next section. It delineates the contributions of the study to the relevant stakeholders or parties by highlighting the impact from the outcome of this study and how it could benefit them in the future, possibly through better decision making within the firms or organisations involved with SMEs.

## 1.6 Contributions of Study

This study provides practical, methodological as well as contextual contribution. In terms of practical contribution, the current and future SMEs, government and policy makers, large firms and bankers can benefit from the output of this study. Apart from that, the study can also contribute to the knowledge in the field, and in terms of social and legal aspect.

Knowing how access to finance is influenced by inter-firm linkages would undeniably benefit the existing SMEs and future potential SMEs. Indeed, Beck, Lu, & Yang (2015) found that access to external finance is positively associated with the decision to become entrepreneurs and the initial investment for microenterprises.

Apart from that, the government can definitely benefit from this knowledge and would be able to focus on creating more linkage programmes or encourage such linkages by creating new policies or perhaps enhance the tax policies to encourage such linkages. The given result of this study can help the government make decisions based on the need of the SMEs. They may also focus on the role of monitoring such programmes and creating virtual platforms to keep records of the linkage and its output and ensuring the availability of such records to the financial providers. This may even enable the sharing of such information among the relevant parties. Sharing such information could also discipline the SMEs to perform in order to maintain good supplier image.

Large firms may also benefit from this study. There is considerable work which highlights the collaboration or academic engagement and commercialisation of university-industry relations (Perkmann et al., 2013). Thus, large firms may use this knowledge for their own interest. Knowing how to ease access to finance for SMEs could ensure a win-win situation since SMEs would be less financially constrained; thus, this guarantees good management and manufacturing process, ensures high quality products, and counters low rejection rate, improving the delivery and timeliness for SMEs; all of which are indirect effects on the large firms as the SMEs are usually the suppliers of these large firms. Helping out SMEs may also be treated as part of the large firms' corporate social responsibility (CSR).

This study would benefit the banks as well. Banks commonly seek knowledge on minimising risk and optimising profit by using methods other than securing collateral (Dower & Potamites, 2014). Perhaps, banks can make better decision when granting loans to SMEs which have linkages with large firms. They would also be able to pursue records or financial information from large firms to screen and serve potential clients. With the help of large firms, it would be possible for banks to identify SMEs with low default risk that are potentially profitable to the banks. The banks would also be able to make better decisions in extending their credit to their SME clients or extending the lending period or lessening the financing cost to these SMEs.

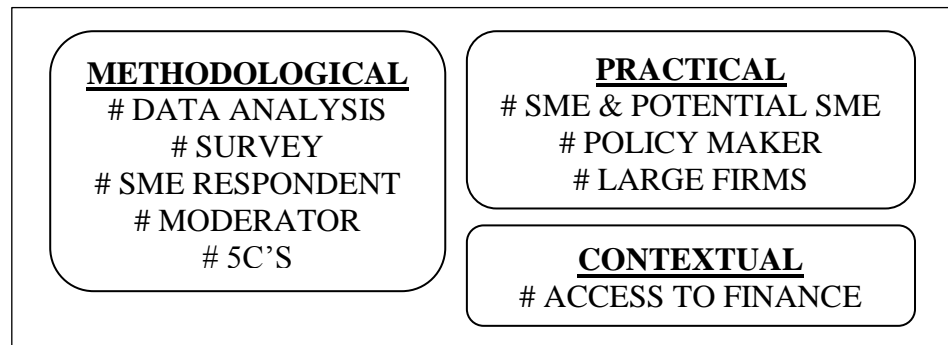
The study on access to finance also contributes towards knowledge. Inter-firm linkages have been widely explored in Malaysia in the context of management perspectives which include value chain and innovation (Aznur Hajar & Ab Hamid, 2008; Hamid, 2003). These studies demonstrate the supply chain environment and explain the expectations, needs and challenges faced by the SMEs and large firms due to their linkage. This study hopes to add to this knowledge of inter-firm linkages related to SMEs from the financial perspective. Undeniably, there could be a link between management improvements towards financial improvement which this study could suggest. The improved capability of the SMEs in managing their business could have an effect on its ability to access external finance. Improved production capacity and sales could translate to better financial position which appears in the financial statements, thus improving its access to finance.

The study also contributes in the social context since improving access to finance would benefit the nation via increased job opportunities, thus helping the country achieve a high-income nation status. Knowledge on improving access to finance could also contribute to SMEs' growth and expansion. These leads to value-added production, increase in gross domestic product (GDP), and thus improvement in economic development.

In terms of the contextual contribution, previous literature in the Malaysian context has studied the factors influencing banks' lending towards SMEs, or in other words, the creditworthiness of the SMEs from the banks' perspective. However, not many have studied SMEs' access to finance which can only be done by looking at it from the SMEs' perspective. One such exception is a study by Navas-Alemán, Pietrobelli, & Kamiya (2012) which examined how SMEs could benefit financially from supply chain linkages. Help from large firms in term of collateral, guarantees and trade credit as well as other alternative external finances could be given to SMEs. This could be the same for this study where this study sought to prove empirically that linkages could ease Malaysian SMEs' access to finance.

In terms of methodological contribution, this empirical study was conducted in the form of a survey whereas most of the literature with regards to access to finance in Malaysia has been carried out in the form of case studies or interviews (Harif, Hoe & Zali, 2011; Haron & Shanmugam, 1994). Past studies, in determining the determinants of bank lending to SMEs use bank officers as their respondents. However, in this study, SMEs were chosen as the respondent to capture the access to finance and linkage from the SMEs' perspective. This study went further by studying the moderating effect of linkages towards SMEs' creditworthiness and SMEs' access to finance. Previous study by Navas-Alemán, Pietrobelli, & Kamiya (2012) was conducted as case studies to explain the effect of inter-firm linkage towards SMEs' access to finance. In contrast, this study tested the moderating relationship through data analysis. In this case, data analysis was performed using SmartPLS to run the structured equation modelling analysis. Lastly, this study offers methodological contribution as it tried to capture the SMEs' creditworthiness via the 5C's as proposed by Harif, Hoe & Zali (2011), Haron & Shanmugam (1994), and Rose (2002) which is more relevant in the Malaysian context and from the SMEs' perspective. This is because assessing SMEs' creditworthiness using financial data provides little usefulness in the context of developing countries due to the limited availability of financial data for SMEs (Claessens & Tzioumis, 2006).

Figure 1.6 provides a bird's eye-view of the contributions of this study. Undoubtedly, this study would benefit a lot of people and lead to better judgement or decision-making process. SMEs are an important driver to economic growth and they should be helped in order to gain a win-win situation. Everyone should play their role and support the government's call in helping the SMEs in Malaysia.



**Figure 1.6:** Contributions of the study

## 1.7 Definition of Important Concepts

The definition of terminologies used in this study is presented in the following section. Definition is provided to assist readers when reading the thesis and to enable better understanding of the important concepts addressed in this study; it is also included to avoid any confusion with regards to the use of the concepts within the context of this study. Important concepts such as access to finance, creditworthiness and inter-firm linkage which are central to this study are defined and explained below.

### ACCESS TO FINANCE

According to Claessens (2006), access to finance refers to the availability (which include quantity and associated cost), accessibility, range, convenience, continuity, flexibility, type and quality of financial products and services

- ▶ **ACCESS-** Access, in this study refers to a mean of approaching or entering into financing contract. It also includes obtaining, examining or retrieving finances. Thus, it is not just limited to those who manage to obtain finances, but also those who applied for finances and those who assess or examine the available finances, regardless of whether afterwards they conclude to apply or not for finance, as long as they have the need for it.

Nkundabanyanga et al. (2014) maintained that a person lacks access to finance if he/she makes the effort to obtain it but fail to secure it.

- ▶ **FINANCE** - Finance refers to funds sought by a borrower for business activities, making purchases or investing. According to Allen et al. (2012), finances include internal sources, external financing from the banks, external financing through the market, as well as alternative financing such as trade credit, angel investors, and founder.

### CREDITWORTHINESS

Creditworthiness is defined as the probability associated with both the ability and willingness of a participant to fulfil their obligation (Safi & Lin, 2014).

- ▶ **CREDIT** - Credit reflects the debt relationship of owner and debtor and includes any form of deferred payment (Sheffrin & O'sullivan, 2002). It involves the unity of the subjective faith and objective behaviour of both parties (Čančer & Knez-Riedl, 2005).
- ▶ **WORTHY** - Worthy refers to having good enough quality to be considered and in this case, the borrower's quality to be considered to secure credit. Borrower's qualities such as capital, capacity, character, collateral and condition are used in this study as suggested by (Harif, Hoe & Zali, 2011) and (Haron & Shanmugam, 1994).

This study uses the 5C's to measure the creditworthiness of the borrowers as it has been found to be the important factors that the banks consider when deciding to lend to SMEs in Malaysia (Harif, Hoe & Zali, 2011; Haron & Shanmugam, 1994). The

following are the definitions according to Haron and Shanmugam (1994), and Peavlere (2013):

**CAPACITY**-Capacity refers to the borrower's ability to meet the loan payments of interest and principal.

**CAPITAL**-Capital is the money invested in the business and is an indicator of how much is at risk should the business fail.

**CHARACTER**-Character is the borrower's attitude towards his obligation to repay the loan. Since there is not an accurate way to judge character, the lender will decide subjectively whether or not the borrower is sufficiently trustworthy to repay the loan.

**COLLATERAL**- Collateral is a form of security for the lender. Banks usually require collateral as a type of insurance in case the borrower cannot repay the loan.

**CONDITION**-Conditions refer to the environment in which the business operates.

## LINKAGE

Linkage is defined as the way in which two or more concepts, object, people or organisation are connected. In this study, linkage refers to inter-firm relationship where the connection is via transaction, mentor-mentee, partnership, collaboration or alliance (Van Gils & Zwart, 2004; Hamid, 2003; Jones & Barry, 2011; Koza, Lewin, & Carolina, 2000) between the SMEs and any large firms.

## 1.8 Conclusion & Organisation of the Thesis

SMEs have contributed greatly to the country and to the society. They also ensure the economic growth of a country. Thus, it is important to understand the challenges that SMEs face. One of the challenges is access to finance. Difficulties in accessing finance would have improved from higher credit evaluations. Due to the lack creditworthiness and unfulfilled financing needs, the role of linkages between SMEs and large firms may ease the access to finance for SMEs.

The following describes the organisation of the remaining chapters in this thesis. Chapter 2 discusses the literature review with regards to characteristics of SMEs in relation to its financials, access to finance, creditworthiness, inter-firm linkages and the theories that may be able to explain the role of inter-firm linkages in influencing SME access to finance. The gap in literature is identified in this chapter and the research framework is developed accordingly.

Chapter 3 presents the hypothesis development and research design of this study. Identification of the sample size, statistical power and measurement items & scales are also carried out in this chapter. The pre-test & pilot study, questionnaire administration, response rate & data representativeness, reasons for using SMARTPLS and PLS measurement analysis are explained.

Chapter 4 explains the preparation of data and analysis of the data via descriptive statistics, exploratory factor analysis and PLS-SEM. The PLS-SEMS results include the analysis of the moderating role of inter-firm linkages.

Lastly, chapter 5 summarises the findings and provides in depth discussions of the findings. The implications of the study and its limitations are identified. Some recommendations for future studies are also proposed. This chapter concludes the study.



## CHAPTER 2

### LITERATURE REVIEW

This chapter begins with arguments and suggestions from previous literature on characteristics of SMEs with regards to its financials. Focus is given to the literature on the subject regarding access to finance, borrower's creditworthiness, especially borrower's capacity, capital, character, collateral and condition (famously known as the 5C's to measure the creditworthiness) as well as the literature on inter-firm linkages. Next, theories related to this study are discussed, followed by the discussion on gaps in the literature and the research framework.

#### 2.1 Characteristics of SMEs in Relation to its Financials

SMEs should not be thought of as scaled-down versions of large ones (Schumpeter, 1934; Sparrow, 2001; Wong & Aspinwall, 2004) as they possess unique characteristics that make the management process different from that of larger firms (Hamzah, 2011; Schumpeter, 1934).

Most owner-managers of SMEs are well-versed about the products and services they produce, but they lack the skills needed to make effective business decisions (Wong & Aspinwall, 2004; Garengo et al., 2005; Pansiri & Temtime, 2008). This includes management's capability in getting access to finance as well as managing cash flows and repayments. In addition to that, the owner-manager or the "one man show" is often associated with lack of documentation or proper financial records, perhaps because they lack accounting skills and knowledge or due to the weakness of the regulatory system (Adeyemi, Obah, & Udofiaa, 2015; The Census of Establishment and Enterprise, 2005). It is generally found that most family owned firms often intermingle their business and personal finances (Muske et al., 2009). When deemed necessary, the owner-manager uses personal finance such as credit cards or personal loans and personal assets to be used as collateral when applying for

extra funds (Fatoki & Asah, 2011) to cope with the business' financing need. It also enables the owner-manager to misuse the business funds as he/she wishes during the times when the business is more stable and is able to generate higher profits. For banks, this can be translated as the misuse of business funds for personal use and bad management habits on the part of the owner-manager.

This lack of standardisation and formalisation is also seen in an SME's human resource management. According to Sharma et al. (2008), SMEs tend to have a low degree of employee specialisation in their tasks with unclear division of activities and involvement of simple management (Pansiri & Temtime, 2008; Wong & Aspinwall, 2004). This explains why some SMEs do not have a finance department whereby it is the accounting department that manages the firm's financing. Some SMEs even delegate the financing and accounting work to other departments such as to the human resource personnel or the administration personnel who have minimal financial knowledge.

SMEs operate in a limited range of markets, locally and regionally. Only a few of them are involved in the international market (Lim & Klobas, 2000; Schumpeter, 1934; Wong & Aspinwall, 2004). There lies the huge potential for SMEs. Given sufficient financing, they will be able to participate in the export market and in turn, generate higher return from the export market due to the bigger market access and currency exchange. However, SMEs are said to offer limited range of products or services (Brouthers, Nakos, & Dimitratos, 2015); thus, they are more likely to be over reliant on a small number of customers (Schumpeter, 1934). The more recent situation is fundamentally the same as claimed by Hudson et al. (2001), and Yusof & Aspinwall (2000). Due to this, SMEs are also considered a risky segment by banks. Since SMEs have a small number of clients, they are highly dependent on them. The success and failure of their customers can have a huge influence on the SMEs, specifically to their sales or total revenue. Thus, SMEs are said to maintain the customer's loyalty through closer and personal contact (Hong & Jeong, 2006; Wong & Aspinwall, 2004) compared to larger firms. SMEs therefore need to be more innovative so that they will be able to offer wider range of products and services and are thus able to diversify their

markets and clients, becoming less dependent on their clients. Innovation could be achieved via research and development but a huge amount of financing is needed for this purpose.

In conclusion, SMEs face financial challenges as they strive for business sustainability as well as growth and expansion. These financial needs are faced by SMEs and financial help for SMEs need to be eased to ensure minimal impact to the business and that no catastrophic issues arise that could jeopardize SMEs' business continuity.

## 2.2 Access to Finance

Financial constraints within SMEs could be catastrophic if nothing is done to ease or curb the problem. For most SMEs, the cost of doing business can take its toll. In fact, SMEs' business performance is highly sensitive to the rise of fuel cost, labour cost, goods and raw materials and electricity tariff (SME Corp. Malaysia, 2014). Financing is also needed to cover marketing and management cost (SME Corp. Malaysia, 2014). Although expensive, firms have to find ways to finance their marketing strategies as it ensures business sustainability as well as provides stable income to the business. In addition to that, access to finance is also needed to cushion for cash flow problems (Atieno, 2009).

When doing business, labour can be costly depending on the number of employees as well as the education level and skills of the employees. Malaysian SMEs are known to have a lack of skilled workers. This is because they are hard to employ and retain at affordable price (Kang, 2016). Apart from that, employees of SMEs are less likely to receive training. This is due to the fact that SMEs are reluctant to invest in training (Lim & Klobas, 2000; Wong & Aspinwall, 2004) since it only benefits in the long run (Wang et al., 2013) and that there is no specific funds or budget for such activities (Hamzah, 2011) as they are financially constrained (Thompson, 2015).

In addition, the cost of administrative procedures related to licensing, permits, inspections and certification are very high (World Bank Group, 2009). However, these costs are crucial to boost a firm's competence and consumer confidence (Jagger, Foxon, & Gouldson, 2013) as well as in abiding the law by applying for foreign worker permits and business licensing (SME Corp. Malaysia, 2012).

Investment in R&D is also essential as it can improve product efficiency, product quality as well as minimise cost and highlight product weaknesses (Kumbhakar et al., 2012; Valentini, 2012; Wang et al., 2013). R&D can be expensive as it incurs GDP-deflated cost, social opportunity cost, and the non-R&D index cost, thus putting SMEs at a disadvantage (Bakker, 2013; Baumol, 2002; Finney, 2014). Thus, financial constraints limit an SME's R&D investment that could lead to promising business future in terms of market opportunity, business resistance, and competitive advantage (Bakker, 2013).

Firms which are financially constrained are also shown to have low levels of export (Gorodnichenko & Schnitzer, 2013; Manova, 2012). As a firm enters the international market, expenses related to insurance, shipping, cost of customs, excise duties and export taxes are incurred (Muûls, 2015). They therefore require more financing, and entering the international market thus becomes more challenging for SMEs.

Access to finance is an important construct in this study. It is the output variable or the dependent variable. Access to finance refers to the ability of the firm to obtain financial services, especially external finance such as bank loans, trade credit, and equity, overdraft, credit card and so on. In this subchapter, previous studies with regards to access to finance are discussed, but the study focuses more on the SMEs. Access to finance is associated with the availability, accessibility and adequacy of finance, cost of finance, range, quality and flexibility of financial products and services, as well as recurrence to accessing finances.

There two types of financing that a firm can use, namely internal and external financing (Mat Nawi, 2015; Rossi, 2016). Internal finance comprises of internal debt and internal equity which encompasses retained earnings, savings, credit card, sale of assets or inventories, internal equity, working capital and funds from family and friends (Mat Nawi, 2015). When a firm makes profit, they can retain the earnings to finance new investment, which is better than obtaining capital elsewhere. This is because internal financing is less expensive than external financing as it does not incur transaction costs or information cost (Mat Nawi, 2015). It is well known that SMEs are opaque and carry high information cost with their relatively short historical performance (Cressy, 2006; Mac an Bhaired & Lucey, 2011; Psillaki & Daskalakis, 2009). Internal financing ensures that capital is immediately available since the firm can obtain it from the firm's savings or reserves, or by selling off their assets that are liquid such as non-operating assets. However, internal financing is limited in amount and size. A bigger proportion of funds can be obtained externally rather than internally.

Internal financing may ease a firm's access to finance as it reflects the firm's capability and profitability. Since internal finance is generated from the retained earnings of the firm, it shows the accumulated profit and if the firm were to borrow, it indicates the firm's capability to repay its debt obligations (Cole, Goldberg, & White, 2004). However, internal finance can also be seen negatively as it may also be regarded as a credit constraint. A firm prefers to use internal financing rather than external financing (Serrasqueiro & Nunes, 2012) due to the cost of asymmetric information (following pecking order theory) but from a different viewpoint, the firm can be perceived as having credit constraints when their debt is low in proportion.

External financing is the new money obtained from outside and brought in to the firm for various purposes. External financing is more expensive than internal financing because it incurs transaction costs and the firm has to go through some processes to acquire the fund. The pecking order theory explains why firm's prefer to use internal financing rather than the external financing (Frank & Goyal, 2003). Examples of external financing are debts, trade credit, and equity issues. External financing requires the firm to maintain its relationship with external parties such as

banks, suppliers and shareholders in order to ensure the availability of the funds in the future. The firm also needs to fulfil the obligations imposed for this type of financing, or else it will affect its creditworthiness.

Financial providers are the entity that provides money facilities or credit facilities to the SMEs. Various financial providers are willing to provide funding for the SMEs, namely banks, the government, family and friends, suppliers to the SMEs, venture capitalists, angel investors and brokers. SMEs can have better access to finance from these financial providers through good financial performance, collateral and relationship lending (Comeig, Fernández-blanco, & Ramírez, 2015; Vos et al., 2007).

Firms' demand for borrowing is interpreted by the banks as an opportunity to make profits and thus the banks do not want to miss this opportunity. Due to this demand from firms and the drive to earn profit, a number of lending innovations have cropped up in the market such as term loans, trade financing, overdraft (Antras & Foley, 2015; Jinjara & Wignaraja, 2016), lease (Beck, 2013; De la Torre, Martínez Pería, & Schmukler, 2010), and factoring (De la Torre, Martínez Pería, & Schmukler, 2010; Klapper, 2005; Mian & Smith, 1992) offered by the financial providers.

Previous studies show that small firms often have less access to formal sources of external finance, thus face higher credit constraints (Beck & Demirgüç-Kunt, 2006; Kumar & Francisco, 2005). Age can also have an effect when applying for finance as young firms are more likely to be rationed in the credit market (Cabral & Mata, 2003). Financing obstacles are more growth constraining for small firms as they finance a smaller share of their working capital and investment with formal financial sources as compared to large firms, thus preventing them from reaching their optimal size (Beck et al., 2006). Schiffer & Weder (2001) pointed out the concern that small firms consistently report higher growth obstacle. It is also suggested that having a large number of small entrepreneurs in a sector might signal poor business environment itself and was illustrated as "creative destruction" where SMEs are not able to grow nor exit (Beck & Demirgüç-Kunt, 2006). Another problem reported is that small firms plea for smaller loans (Copisarow, 2000), thus face higher risk premiums and higher

transaction costs. This is because they have less collateral and are more opaque (Beck et al., 2006). Banks are also reluctant to lend to SMEs as they are regarded as high-risk borrowers because of their inadequate assets, low capitalization, and high mortality rate (Sia, 2003). Apart from that, informational opacity also results in higher monitoring costs. Due to limited data on the borrowers, monitoring costs are higher for SMEs. Bank credit is more expensive than credit from capital markets due to monitoring cost and therefore those that do not have access to capital markets will be the only firms that seek bank loans. Cost can be lowered with a shorter time for loan approval via the use of a credit scoring system (López, 2007); however, the problem of informational opacity persists for SMEs. Unlike listed firms, SMEs do not have access to the international capital market (Hall, Hutchinson, & Michaelas, 2004); thus, they have less alternatives in financing and are more credit constrained (Behr, Norden, & Noth, 2013).

Due to the problem of information opaqueness, small firms are more likely to be involved in relationship lending. Previous literature also found that bank size makes a difference in relationship lending as small banks mostly use relationship lending to lend more to small enterprises (Berger & Schaeck, 2011; Elyasiani & Goldberg, 2004). Williamson (1967) uses the theory of hierarchical control to explain the differences in bank operationalisation. Lending officers are usually the owner or at least in close contact to the owner of small banks, thus putting them in competitive advantage in relationship lending as lending officers have incentives to make more loans to increase their personal return but also ensure that this interest is aligned with the welfare of the bank (as the owner of the bank). Large firms, on the other hand, are reluctant to lend to firms that do not keep formal financial records and are more opaque. Unfortunately, this phenomenon of small banks using relationship lending is disappearing through bank mergers (Elyasiani & Goldberg, 2004).

Smaller firms are also reported to finance a larger share of their investment with informal sources of finance (Beck & Demirgüç-Kunt, 2006). Turvey & Kong (2010) argue that money lending lump by family and friends work as microcredit with certain advantageous characteristics such as limited collateral, flexible terms and



interest rate which is overwhelmingly zero. It is therefore no surprise that SMEs have greater reliance towards lending from family and friends (Ayyagari, Demirguc, & Maksimovic, 2010). However, trust is essential in lending via family and friends since repayment is virtually guaranteed through social pressure.

Even though informal financing is associated with higher productivity growth and reinvestment, Ayyagari, Demirguc, & Maksimovic (2010) pointed out that informal finance relies on relationship and reputation. However, informal financing cannot substitute for formal financing because their enforcement and monitoring instruments are ill-equipped to scale up and encounter the demand for financing (Ayyagari, Demirguc, & Maksimovic, 2010). Internal finance such as savings and retained earnings are also part of informal finance (Allen, Qian, & Qian, 2005). Nyamboga et al. (2014) propose that financial literacy can influence SMEs' savings ability and they will thus be able to access to a variety of financial products. Financial literacy consists of knowledge in budgeting, savings, debt management, financial negotiation, and banking services which are beneficial to the SMEs. Financial knowledge allows firms to encounter difficult financial times as firms are able to accumulate savings, diversify assets, and purchase insurance. Apart from savings, Aktas et al. (2012) found that retained earnings are the second largest source of capital after trade credit. Unfortunately, retained earnings are also limited for most new SMEs (Fatoki, 2014) due to the fact that they are less experienced and are new in their market.

Previous studies found that firm size, firm's age, legal and financial institutions (Beck et al., 2006), government favouritism (Aggarwal & Goodell, 2014), supply and demand of finance (Aggarwal & Goodell, 2009) can influence access to finance. Financial institutions influence access to finance via variations in transaction costs (Aggarwal & Goodell, 2009) and also via their governance structure (Berger & Udell, 2006). Larger, older and foreign owned firms are found to enjoy increased access to finance.



Access to finance is defined in Claessens (2006) via various dimensions, namely availability, accessibility, adequacy, cost, range, quality, flexibility and recurrence of financing. These dimensions are further discussed as follows.

#### *Availability of finance*

This follows the question “Is external finance available in the market?”. It is associated with money supply and demand as well as economic condition of the specific countries. During economic crisis, firms are reported to have more difficulties in getting finance (Huang, Shi, & Zhang, 2011) as the demand for money increases because more firms are in need of financing to absorb the financial shock.

#### *Accessibility of finance*

The accessibility of finance is often associated with the availability of bank branches or other financial institutions in the geographical area of the firm. Financial institutions’ development is important in order to ensure the accessibility of loan facilities both from commercial banks and development financial institutions (Delis, 2012; Haron & Shanmugam, 1994).

The accessibility of finance is also often associated with certain requirements that need to be fulfilled. It often comes with guarantor requirement and collateral requirement. Previous studies show that collateral requirement is lower for loans with previous successful repayment as compared with previous defaulted loans (Comeig, Fernández, & Ramírez, 2015). Apart from that, the perceived risk of the borrowing firm by the financial institution will require the firm to offer more collateral, wait longer for loan approval, and as such will be screened more rigorously (Brau & Osteryoung, 2001). This is in line with Nyamboga et al. (2014), as risk perception of small businesses is high, and hence the collateral requirement which in turn makes it harder for them to secure funds from the lenders.

Having the necessary collateral will enable the borrowers to better secure the funds they need. Brau & Osteryoung (2001) argue that loans that include collateral reduce the risk borne by the lender and hence loan scrutiny is reduced, resulting in fewer days to approve the loan. Apart from that, Navas-Alemán, Pietrobelli, & Kamiya (2012) suggested that reputation effect derived from inter-firm linkages can be considered as another kind of collateral, namely intangible collateral, and that the large firms may also facilitate the access to finance to the small business via its receivables. The study argues that receivables from well-known large firms are often accepted as collateral. However, there are also cases where borrowers pledge higher collateral to get lower interest rates (Comeig, Fernández, & Ramírez, 2015). Ortiz & Penas (2008) found that loan maturity increases with collateral pledge. This suggests that small business borrowers can gain longer loan maturity with the help of collateral. The study was conducted on 1,672 loans to small business granted during the period 1990-1994 and it also found that the use of personal collateral can help in increasing loan maturity compared to the use of business collateral. This suggests that improved creditworthiness of SMEs in character of the borrower such as successful history of repayment and having higher personal collateral as the owner of the small business can reduce the risk perception from the lender's perspective where collateral requirement will be reduced to them, thereby having better access to finance.

Harif, Hoe & Zali (2011) found that banks require the borrower to provide them with guarantors. This may be interpreted as credit constraints for the companies that are still young as they might be facing difficulties in providing the bank with guarantors. A guarantor is often required to co-sign the credit since guarantors allow lenders to shift part of the loan recovery risk to them as well as to overcome the credit market imperfections (Samujh, Twiname, & Reutemann, 2012); however, the guarantors are very rarely required to step up to their commitment.

On the other hand, group lending incurs joint liability which is regulated in advance, thus enabling banks to get back principal and interest from the guarantor firm (Wen, 2012). The banks suffer little loss and thus are more willing to give out loans to the guaranteed party. This suggests that group lending will improve access to finance

for the borrower with the help of a third party which can be part of the supply chain and may play the role of a guarantor. This is in line with Navas-Alemán, Pietrobelli, & Kamiya (2012) who suggest that the chain leader in supply chain alliance can play the role of guarantor through trade credit and loan financing, thus facilitating access to finance for the SMEs.

As pointed out by Zecchini & Ventura (2009), there are various ways that SMEs can solve the guarantor problem required by the bank. One of the ways is for the small businesses to join hands and mutually share their debt risk, and the other is to set up public funds at state and regional government level for the purpose of offering guarantees which work as insurance/reinsurance services to institutions that lend to SMEs. It is therefore possible for SMEs under the same supply chain to join hands and mutually share their debt risk to get better access to finance with the large firms playing the role of insurance/reinsurance as suggested by Zecchini & Ventura (2009), that is by becoming the guarantor for the SME financing to enhance the SMEs access to finance.

#### *Adequacy of finance*

The availability and accessibility of finance does not guarantee that sufficient amount of credit is available as credit may be rationed. Adequacy of finance is associated with this credit rationing, i.e. borrowers may not get the same amount of credit that they applied for. Credit rationing is often exercised by financial institutions. Thus, instead of having the necessary financing, borrowers face the possibility of absorbing a proportional amount from the applied loan. After the loan application is submitted to the bank, the borrower is often kept wondering about the proportion that is required to be absorbed and if they have the necessary fund to absorb the portion in order to be able to proceed with the loan. Previous study by Sharma & Zeller (1997) found that a high degree of credit rationing improves repayment performance. Although this suggests that credit rationing is a tool used by banks to ensure the repayment of the loan, it might be a credit constraint for the SME borrower as it discourages them especially with the lengthy process they have to go through to prove

that they are worthy of the loan. Where credit rationing applies, firms are likely to use supplier trade credit as substitute to the short-term financing from the bank (Bastos & Pindado, 2013; Petersen & Rajan, 1997). It is argued that information asymmetric with regards to firm's credit risk is also the driver to credit rationing (Ferri & Murro, 2015). Credit rationing is often related to collateral requirement (Zecchini & Ventura, 2009) as rationing can be improved via collateral. Therefore, firms with better collateral position not only have better creditworthiness, but also have lesser credit rationing and improved access to finance as they are able to get a higher portion of the required loan.

### *Cost of finance*

This is associated with interest rates and the fees, charges and commissions charged to the borrower. Popov & Ongena (2011) found that lowering the interest rate charged can have positive impact on SMEs' access to finance. Indeed, Bougheas, Mizen, & Yalcin (2006) argue that interest rate indicates tightened monetary policies. The study on 16,000 manufacturing firms in England, Scotland, Wales and Northern Island also found that firm size, firm's age and profitability can influence the interest rate of financing.

With regard to financing cost, Boot & Thakor (1994) theorized that based on the infinite-horizon model of competitive credit market, borrowers with good project realization obtain infinite sequence of loans below spot market cost. The study refers to the borrowing reputation which is related to whether borrowers have defaulted on their previous loan or not, and the cost of the next loan. Apart from that, Behr & Sonnekalb (2012) argue that information sharing may increase competition among lenders and thereby reduce the cost of credit. With relationship lending, the cost of financing is lower at the initial stage; however, lenders later develop private information on the borrower over time and use the informational advantage over competitors and charge higher interest rates as the relationship extends to a longer period (Comeig, Fernández, & Ramírez, 2015; Petersen & Rajan, 1995).

### *Range, quality and flexibility of financial products and services*

This refers to the financial services and financial products that are available to the SMEs. There is a wide range of financial products available in the market. This includes term loans, trade financing, overdraft, credit card, advance payment, trade credit, lease, and factoring. Often, the banks overlook the importance of explaining their products and services to their clients, assuming that SMEs know the procedures and processes as well as how these products work. Borrowers with less or little financial literacy have difficulty to understand the cost and benefit offered by various financial products; thus, they are more likely to make wrong financial decisions (Cheng et al., 2014). Banks should provide explanation on the procedures, processes and product information, as well as how helpful the banks are in advising clients on the use of their financial products and the advices offered when the SMEs are facing repayment difficulties. The quality of the financial services provided to the SMEs includes the reduction of transaction errors, transaction cost, and waiting time (Dauda & Lee, 2016).

Copisarow (2000) showed that micro businesses require minimal waiting time for a loan to be approved. However, the length of time for a loan to be approved depends heavily on the legal requirements and the borrower's inability to supply all the necessary information on time and in full. Apart from that, Brau & Osteryoung (2001) found that the learning curve, type of loan and industry may also influence the length of time. First-time loan applicants take a longer time due to the learning curve, while vehicle and equipment loan applications take more time compared to applications for lines of credits and lastly, loans from construction, wholesale, and manufacturing firms take less time than those from firms in the services industry.

Copisarow (2000) also reported that the time taken for the loan to be granted can influence the repayment of loans. The shorter the processing time, the better the chances of the business receiving the money it needs and hence resulting in a lower loan loss rate. This is because the short processing time increases the borrower's

confidence in the institution, thereby increasing their willingness to repay. Thus, some institutions aim to shorten the waiting time as this results in lower loan loss rates.

The flexibility of finance follows the questions: Can the products be tailored to suit the need of the borrowers? Can the maturity of the loans be extended? Can the repayment be deferred for some time? Should the borrower be asked to provide more guarantor and collateral? The flexibility of these financial products and services play an important role in determining access to finance as there is an increasing need for flexibility especially on interest rates and payment schedule because the flexibility allows borrowers to have more time to improve repayment ability by exploiting their loans terms and reduce default risk (Sun & Im, 2015).

Loan maturity is another term of contract that can be manipulated to serve the financing needs of firms. Basically, a firm's need for financing can be divided into short term and long-term financing. Shorter loan maturity is found to mitigate problems associated with information asymmetry for small business lending (Ortiz & Penas, 2008). Older and less experienced firm owners with poor credit histories and firms that are more informationally opaque are often given shorter credit maturity. Maturity and collateral requirement are used to solve this agency problem. This is because the longer the maturity, the lower the repayment instalment, and this can be interpreted as eased access to finance as the firms are better able to repay the smaller amount of repayment. However, this puts the lenders in greater risk of default as the borrower is given more time and opportunity to alter its risk. Ortiz & Penas (2008) also found that maturity increases with collateral pledged. Indeed, personal collateral is found to be associated with longer maturity, unlike business collateral. This suggests that personal wealth of the business owner plays an important role in determining the maturity of loan to small businesses.

## *Recurrence of finance*

This follows the question: Can finance be accessed repeatedly? As a business continues to thrive whether for survival, growth or expansion, the need for financing need also continue. Firms need the financing along these different phases for many reasons such as working capital, purchase of assets, R&D and many more. Thus, financing should be available repeatedly. Previous literature has shown that borrowers with bad repayment records face difficulties in getting finance for their next loan (Song & Wang, 2013).

The availability, accessibility, adequacy, cost, range, quality, flexibility and recurrence of financing are therefore important items for access to finance as they measure access to finance from different perspectives. An SME may face challenges in getting access to finance due to any of these constraints.

Previous studies also pointed out that a bank's decision to approve loans to SMEs is based on some factors on the borrowing party (Harif, Hoe & Zali, 2011; Haron & Shanmugam, 1994; Uchida, 2011). The strength and weaknesses of the borrower could make a difference. It represents the potential and risk that the bank will face once the loan has been approved to the said borrower; thus, banks are crucially screening, evaluating and monitoring the borrower to minimise the risk. Borrowers with better credit ratings are much preferred. Having discussed and explained all the issues related to access to finance including the various dimensions, the next section addresses the issue of the creditworthiness of SMEs.

### **2.3 Creditworthiness**

Creditworthiness refers to the valuation performed by lenders that determine the possibility that a borrower may default on his/her debt obligation. Various methods are used by financial institutions or lenders to evaluate the creditworthiness of borrowers. Some of the methods are the 5C's, LAPP, 5Ps, CAMPARI, and FAPE

method for credit evaluation (Abbadi & Karsh, 2013; Harif, Hoe & Zali, 2011; Haron & Shanmugam, 1994). The LAPP method evaluates creditworthiness based on several factors, namely Liquidity, Activity, Profitability, and Potential while the 5Ps uses People, Purpose, Payment, Protection, Prospective for evaluation. The CAMPARI method is qualitative based as it uses the factors of Character, Ability to pay, Margin, Purpose, Amount, Repayment terms, and Insurance for evaluation while FAPE uses quantitative factors such as Liquidity ratios, Profitability ratios, Operation ratios, Debt ratios, Character and Credit record. The 5C's method is the most frequently used approach in Malaysia (Harif, Hoe & Zali, 2011; Haron & Shanmugam, 1994).

A study by Haron & Shanmugam (1994) on 49 loan officers from commercial banks with job scope involving loan approvals to Malaysian SME found that bank officers in Malaysia consider 5 basic factors namely capacity, capital, character, collateral, and condition. The study also emphasizes that the most important factor is character, followed by capacity then collateral.

Although the study uses 5C's, the definition on each of the 5C's is incomplete thus the summarisation and definition of each dimension of creditworthiness described in Table 2.1 are based on a combination of course, i.e. from Haron & Shanmugam (1994) and Peavlere (2013), and these dimensions are further elaborated in the next few paragraphs.

**Table 2.1:** Definitions of 5C's elements

<b>5C's elements</b>	<b>Definition</b>
Capacity	Borrower's ability to meet the loan obligations.
Capital	Money invested in the business and is an indicator of the risk involved should the business fail.
Character	Borrower's attitude towards the repayment of his loan obligations. There is no accurate way to judge character, therefore the lender will have to decide subjectively the likelihood of the borrower to repay the loan.
Collateral	A form of security for the lender and works as a type of insurance in case the borrower is unable to repay the loan.
Conditions	The environment in which the business operates.



### *Capacity*

From the definition on capacity, it may be argued that a firm's ability to make repayments can be inferred from its profitability. SMEs are known to lack the capacity to repay their loans, and thus are only able to absorb small amounts of funds from financial institutions (Nyamboga et al., 2014). Nyamboga et al. (2014) gathered data from 30 SMEs in Ngara, Nairobi, with the nature of their businesses being related to hardware, clothes, general retail and others. The data consisted of opinions on their experience, financial literacy and loan repayment.

In line with that, Strahan (1999) conducted a study on 57,782 US credit facilities from large corporate industrial businesses during the year 1988-1998 and showed that more profitable firms are able to borrow on better terms with the banks. SMEs' capability to repay their loans indicates smaller risk to the banks. This can be quite attractive to the banks knowing that the borrowers are capable of handling their current debt and are having enough profit to be able to repay their future loan. Thus, SMEs with better capacity are more likely to get better access to finance.

However, the firm's capacity to generate profit may also have a negative effect towards applying for external finance. Demirgüç-Kunt & Maksimovic (1998) conducted a study on 30 developed and developing countries including Malaysia during the period of 1980-1991 and found increased reliance on external finance for established firms with lower profit rates. This implies that internal finance is preferred by the firm which enjoys high profit rates as it is able to retain the profits for investment purposes, enabling it to incur lower costs and less hassle in terms of documentation (Pecking Order Theory as explained in Mat Nawi (2015)).

## *Capital*

Capital, or money invested in the business symbolises the firm's commitment to the business. If anything goes wrong, a firm with heavy capital investment will most likely hold on to the business and work things out, rather than succumb to failure. A study by Green (1992) examines owner-managers' and other stakeholders interpretations of eight (8) UK management buy-outs and found that owner's control and debt control have positive effects on managerial motivation. Motivation here refers to the borrower's motivation to "put up a fight" with business issues and challenges instead of submitting to defeat. Unfortunately, SMEs have limited access to capital. Retained earnings and personal finance such as working capital, sale of assets and inventory, internal equity, credit card, savings and funds from family and friends are the main internal sources of capital for sole proprietors (Titman, Keown, & Martin, 2011). Retained earnings (Ou & Haynes, 2006) and personal savings (Fraser, 2005) were also found to be the primary source of capital for SMEs. Personal savings also include the owner's financial sources in term of cash, inheritance, winnings, personal loans, personal credit card and investment income (Irwin & Scott, 2010).

Capital is an important factor that banks look at when granting loans because capital utilisation enables a firm to cushion against financial shock (Christiano, Eichenbaum, & Evans, 2005). Financial shock also happens in between the time of product delivery and payment received. Indeed, Van den Bogaerd & Aerts (2015) suggested that firms need to hold precautionary cash reserve at the time of delivery as the payment from buyer is uncertain and crucial. Having bigger and sufficient capital can help absorb the financial shocks and enable the firm to last longer in the business. Apart from that, firms with bigger capital are more committed to the business and this becomes the firms' motivation to achieve success since they have more assets and money at stake. Thus, banks are more likely to give out loans to firms with larger capital. A study on a panel data set of 2439 public listed firms originating from 49 countries during 2002-2009 by Cheng, Ioannou & Serafeim (2014) found that better access to finance also lowers the capital constraints that a firm is facing.

On the other hand, Shin & Park (1999) studied panel data of 629 listed manufacturing firms in Korea during the period 1994-1995 and suggest a negative relationship between capital and access to finance given the substitutional effect between capital and access to external finance, implying a firm's excessive reliance on internal finance is due to its inability to access external finance. It is associated with information asymmetry. SMEs may be denied access to finance due to the unavailability of borrowing information. In fact, informationally opaque SMEs are facing difficulties to borrow from financial institutions (Shen et al., 2009) especially in the period of financial crisis (Zhang, Song, & Zhong, 2016), thus resulting in them having to rely heavily on internal capital or retained earnings rather than borrowings (Serrasqueiro & Nunes, 2012). Additionally, following the pecking order theory, firms are shown to have tendencies to shift to external finance from banks once cash flow from internal resources is exhausted (López & Sogorb, 2008; Sheng, Rani, & Shaikh, 2011), which thus explains the substitutional effect. The preference towards internal funds or capital is associated with the cost of asymmetric information. The effect of information asymmetry should not be underestimated as it can deny a firm its access to finance and can be costly as well.

### *Character*

Character is one of the important factors that banks look at when approving loans as they are exposed to credit risk, which is the potential loss from the refusal or inability of the borrower to pay what is owed in full or in time (Cole, Goldberg, & White, 2004). The borrower's inability to repay the loan is often focused on the firm's profitability but the borrower's character in refusing to repay the loan is different from his/her inability to pay. Therefore, the character of the borrower plays an important role when banks decide to lend money. A firm's repayment performance or history is often used to describe the firm's character. Thus, firms struggle to maintain a good borrowing reputation in order to get better access to finance. A study conducted on 2400 Chinese firms during the period 1999-2002 by Ayyagari, Demirguc, & Maksimovic (2010) shows that having good credit history signals a strong character which enhances access to finance. Firms that default on their payments are more likely

to default again and are perceived as having higher default risk by banks. Indeed, a study from Comeig, Fernández, & Ramírez (2015) proved that banks impose more requirements, screening and longer processing time for loan approval towards borrowing firms that have defaulted on their payments previously. Firms with better repayment history are preferred by the banks as they are perceived to be less risky and thus get better access to finance.

### *Collateral*

Banks' emphasis on collateral is an important factor when deciding to grant loans (Uchida, 2011). For this, SMEs face challenges in getting access to finance as they lack the necessary collateral required by the lenders (Nyamboga et al., 2014). Indeed, Japanese banks are often criticized for their overreliance on real estate collateral, especially after the "bitter" experience of the bubble period. A study from Comeig, Fernández, & Ramírez (2015) on 734 loans between 44 Spanish banks and Spanish SMEs during the period 1982-1998 found that pledging higher collateral enables the borrower to have lower interest rates as collateral which can be used to signal the good borrower from the bad. Additionally, a study by Minnis & Sutherland (2017) conducted on 4,518 loans granted by 35 banks to 3,148 borrowers in US during the years 2010-2012 found that a higher pledged collateral can reduce bank's demand for financial reporting. Apart from that, Uchida (2011) also suggested that banks require more collateral as compensation for shortfall in repayment from the previous borrowing of the borrower.

Although collateral is used to reduce the observed higher risk of borrowers, house banks were reported to exploit the lock-in of their borrowers by demanding higher collateral (Elsas & Krahn, 2000; Menkhoff, Neuberger, & Suwanaporn, 2006). The study by Elsas & Krahn (2000) on 125 individual US debtors in the year 1992-1996 on the other hand shows a negative association between relationship lending and collateral. SMEs with higher build-up collateral were found to be at a disadvantage as they were locked-in by their house bank, had reduced power of negotiation during financial distress, and were restricted from dealing with other

lenders. Menkhoff, Neuberger, & Suwanaporn, (2006) studied a data set of 560 credit files of Thailand's commercial banks also supports this.

### *Condition*

The condition element in the 5C's of creditworthiness refers to the competitive economic condition, technology, product demand, and product distribution which can affect the borrower's business (Harif, Hoe & Zali, 2011). An unfavourable economic condition is one of the factors considered by banks when rejecting financing applications as it can affect the borrower's ability to repay their financial obligations. Atanasova & Wilson (2004) conducted a study on 639 UK firms during the period of 1989-1999 and found that monetary condition influences access to external finance, implying a positive relationship between condition and access to finance. However, this is beyond the control of the lender and the borrower since it differs according to the business model of the firm. For example, SMEs in a typical food and beverages industry are more likely to be exposed to huge risk such as festivals. The demand for their product constantly changes drastically. Thus, firms need to have proper and frequent communication along the supply chain in order to have plan better on the raw materials and production forecast. Apart from that, they also incur huge wastage as their products have an expiration date. However, firms with better technology are less risky as the products can be diversified into canned or frozen foods which have longer life expectancy. Additionally, the hike in product demand during festive seasons can be overcome with well-equipped machinery which have larger production capacity. Firms in a more general industry are also in a better condition as they are able to serve a more diversified sector. For example, the metal industry can serve the automotive sector, construction sector, transportation sector as well as machinery sector. Since they produce unfinished and semi-finished products, they are less risky in terms of business condition. These can definitely affect the firm's financial stability and financial risk, and is thus perceived as risk to the banks. Thus, business condition has become one of the deciding factors for banks when approving loans. Theoretically, banks would prefer to give out loans to firms in better conditions. Thus, firms

experiencing better business conditions are more likely to have better access to finance.

## 2.4 Inter-firm Linkages

It is understood from the previous sections on access to finance and creditworthiness that good creditworthiness of a borrower can lead to better access to finance. In this subchapter, the previous literature with regards to inter-firm linkages and its relation to creditworthiness and access to finance are discussed.

Linkage between firms can facilitate financing in the form of trade credit (Aktas et al., 2012; Van den Bogaerd & Aerts, 2014) and group lending (Hill, & Sarangi, 2012; Wen, 2012). Group lending refers to a lending practice where small groups borrow collectively from each other or from the banks and group members encourage one another to repay. However, bank credit and trade credit are proven to have substitution effect with each other (Huang, Shi, & Zhang, 2011). Often, the linkage between firms are studied based on the supply chain with trade credit as the outcome for access to finance from this type of relationship while linkage between banks and firms are often studied with bank's lending as the outcome of the financing from this type of relationship. Supply chain linkage has comparative advantages over bank relationships (Mian & Smith, 1992; Petersen & Rajan, 1997; Smith & Schnucker, 1993; Van den Bogaerd & Aerts, 2014).

However, trade credit is expensive, even more than bank loans (Bitler, Robb, & Wolken, 2001). Information on the financial health of the buyers are gained as a by-product of the selling function and this put suppliers at a cost advantage over banks. Similarly, information about specific buyers are produced by conducting business with a network of similar buyers, thus vendors are better able to distinguish between a buyer in financial trouble and a general market decline for the seller's products, compared to a financial institution. Additionally, if the goods are more valuable to the supplier as

collateral than to a financial institution, then the supplier may have a cost advantage in collection.

This study explores the influence of linkage (between SMEs and large firms) on an SME's access to finance and its creditworthiness. An obvious influence that has been mentioned in previous literature is the use of group lending. SMEs with linkage have the advantage of group lending, thus their creditworthiness via capacity, capital, character, collateral and condition as well as access to finance may differ from those without these linkages. Thus, the use of linkage as moderator was studied to evaluate the differences in access to finance and creditworthiness between SMEs with and without linkage, and to understand the extent to which this linkage facilitates access to finance for an SME.

#### **2.4.1 Types of Linkages in Supply Chain**

Previous studies on supply chain linkage have classified it in many different ways. Oum et al. (2004) categorised linkage into horizontal alliance (voluntary and long term contractual agreements between firms in the same industry) and vertical alliance, while Barnir & Smith (2002) classified it into technological and manufacturing alliance (such as joint ventures, technology transfer agreement or joint manufacturing) and support alliance (such as sharing of advertising, marketing, personnel training or distribution). Albers, Wohlgezogen, & Zajac (2016), on the other hand, classify the inter-firm linkage into formal relationship and informal relationship (distinction based on legal basis of the alliance), while Sorenson & Stuart (2001) classify it into domestic alliance and international alliance based on the geographic location to distinguish domestic and international or proximate and distant alliances.

However, according to Van Gils & Zwart (2004), the classification of inter-firm linkage is based on the inter-firm interdependence towards each other and also based on the shared resources. The study by Van Gils & Zwart (2004) was based on the Dutch and Belgian SMEs. The authors categorised inter-firm linkages into 1)

market transaction, 2) tactical alliances, 3) strategic alliances and 4) shareholder's linkage. Market transaction is defined as a normal market transaction relationship where transaction prices are determined by the market. Majority of SMEs stay in this relationship as they are afraid of losing their competitive advantage and their know-how to the competitors.

Tactical alliance on the other hand is defined as cooperative agreements with functional activities executed which include purchasing, sales/marketing, and subcontracting. Entrepreneurs label this relationship as "gentlemen's agreement" or "partnership without financial links". The motivations for initiating this type of linkage include supply advantages, product expansion, obtaining price and specialisation, satisfying clients, and quality improvements. SMEs aim to not just sustain their clients or partner's satisfaction and loyalty but they also try to increase their satisfaction and loyalty. They are also engaged in this type of relationship in order to prevent seasonal production problems. For example, if the client/partner communicates their estimated annual ordering volume at the beginning of the year, they receive better prices and supply conditions. Later, the client/partner reduces the number of suppliers and the remaining ones become "preferred suppliers". Competition remains one of the crucial considerations for SMEs. Additionally, in the case where no other option is available, SMEs would also consider outsourcing part of their production to their allied competitors (Raman & Ahmad, 2013).

Strategic alliances are mostly developed between firms which produce complementary goods. Most SMEs in this type of relationship most frequently engage in joint R&D and share knowledge about the production process. The motivation to engage in this type of relationship is due to learning or knowledge acquisition and increasing client satisfaction and loyalty. In addition, stimulating innovation, obtaining quality improvements and price advantage, and expanding market and product range are also mentioned quite frequently. Knowledge shared is often about the production techniques and product quality. However, the requirements to develop strategic alliance with their partners have become stricter and this is one of the challenges SMEs now face. It has been discussed in Van Gils & Zwart (2004) that in order to qualify as



a supplier, SMEs have to offer tailor-made solutions to ascertain product of quality, remain flexible for product adjustments according to the needs of the clients, and have the capabilities in order to join the clients' R&D activities. Clear difference between tactical and strategic alliance is that strategic alliances are used in the knowledge accumulation process and the creation of new capabilities and competences. This alliance facilitates the transfer and absorption of new knowledge.

Another type of linkage is the shareholders' linkage. This type of inter-firm linkage is further divided into a few types, namely 1) equity joint venture (Das & Teng, 2001), 2) minority equity investment (Gulati & Singh, 1998), and whole subsidiary firms (Aharony, Lee, & Wong, 2000). This type of alliance provides better opportunity to acquire partner's tacit knowledge and other knowledge-based resources and additionally involves property-based resources. As the firm has positions in the other firm's equity, it has influence and control over the other partner (Allen, Qian, & Qian., 2005). The shared ownership helps control the opportunistic behaviour and reduces moral hazard. A parent firm is also shown to boost the subsidiary firm's earnings (Aharony, Lee, & Wong, 2000).

#### **2.4.2 Linkage Effect**

In terms of sharing, alliances with shared resources have consolidated R&D departments and agreements (such as licensing or joint development agreements, technology commercialisation agreements, simultaneous engineering) for the purpose of improvement in technology and know-how. Apart from that, in terms of cost sharing, there are partners that share the cost of implementing new manufacturing or production facilities. On the other hand, asset sharing between partners utilises existing infrastructure in foreign countries owned by local companies. Partners are able to then take advantage of the existing infrastructure of another enterprise enabling them to distribute their own products and therefore to gain easier access to these markets.

One of the effects of linkages is reputational effects. Reputational effects often affect how a firm as a whole or some of its attributes are perceived by relevant parties (Deephouse, 2000; Rindova et al., 2005). In fact, literature on supply chain linkage has often discussed reputation. Reputation which is considered as a valuable intangible asset can provide sustainable competitive advantage and enhance a firm's performance (Van den Bogaerd & Aerts, 2014). A firm with relatively a good corporate reputation is better at sustaining profits over time (Roberts & Dowling, 2002) as this is associated with economic benefits such as higher perceived product quality, stronger customer loyalty and increased profit margin and sales (Caruana, Cohen, & Krentler, 2006).

Wen (2012) suggests that when a firm in group lending repays its loan, the guarantor firm improves its social reputation and this later brings improvement in brand value and social influence. It can be argued that alliances tend to be shaped by objectives of reputation collaboration. Indeed, Stuart (1998) suggests that a firm's prestige may influence its alliance formation.

There is significant spill over effects of media descriptions of specific corporate reputation attributes to other reputation domains (Carroll, 2004). The public perception of the firm's products and services are caused by amplified media coverage devoted to financial performance (Carroll, 2004). Thus, it can be argued that alliance reputation might affect the financial reputation of the firm. Perhaps, a partner's reputation in an alliance may influence the evaluation of the financier towards the borrowing firm as such spill over effects suggest that a firm's public processes information actively to evaluate the condition of the firm. Indeed, Loumioti (2012) suggested the use of intangible assets such as borrower's reputation as loan collateral and found that loans secured by intangible assets perform no worse than those secured by tangible assets.

Partnering with foreign firms is found to be the core component behind the success of export ventures (Bloemer, Pluymaekers, & Odekerken, 2013; Leonidou, Katsikeas, & Hadjimarcou, 2002), implying that cross-border ventures involve activities that are resource-demanding; thus, small businesses gain valuable resources,

such as foreign market knowledge which are difficult and costly to obtain independently, by developing partnerships with exporters (Perez, Babakus, & Kedia, 2010). SMEs strategically gain from their relationships with foreign importers as it enables them to counteract the challenges of international expansion (Hilmersson & Jansson, 2012). Additionally, previous literature also shows that many firms rely on partnerships to penetrate overseas markets because is easier (Skarmeas et al, 2008) and less costly (Lages, Silva, & Styles, 2009).

Supply chain linkage can put a firm at an advantage through competitive advantage. Supply chain management is effective if risks are shared mutually and rewards yield long-term competitive advantages and cooperation among the supply chain members (Kache & Seuring, 2014; Wu, Chuang, & Hsu, 2014). Apart from that, forming strategic alliances with supply chain partners create customer value, thus provides competitive advantage (Lee, Olson, & Trimi, 2012). Competitive advantage is of two types, namely cost leadership and differentiation (Porter, 1985). Thus, enhanced customer service and economic value is possible as a result of synchronised management of the flow of information and physical goods (La Londe, 1997). Supply chain management can therefore improve the profitability of the supply chain and its members. Competitive advantage can also be achieved through the provision of low cost and differentiated services (Christopher, 2016; Lin, 2013; Lusch & Vargo, 2014).

Based on previous literature, supply chain alliance leads to increased future sales (Giannetti, Burkart, & Ellingsen, 2011; Paul & Boden, 2008; Petersen & Rajan, 1994). According to Kumar, Teichman, & Timpernagel (2012), supply chain management improves a firm's profitability which can be accomplished by enhancing overall customer satisfaction. According to Porter & Fuller (1986), firms creating and aiming to establish a profitable position against the forces that determine industry competition drive competitive advantage. As such, supply chain management is concerned with improving both effectiveness (i.e., customer service) and efficiency (i.e., cost reduction) in a strategic context (i.e., satisfaction through integrated supply chain management and creating customer value) to ultimately generate profitability. Supply chain alliance not only improves a firm's sales (Petersen & Rajan, 1994; Van

den Bogaerd & Aerts, 2014) and profitability (Kumar, Teichman, & Timpernagel, 2012), but indirectly it also improves the SME's capacity to service its debts.

It is suggested that the use of trade credit within supply chain linkage provides firms with the opportunity to reduce precautionary cash reserve and economise cash management (Itzkowitz, 2013; Nilsen, 2002). Trade credit is created whenever suppliers offer terms that allow the buyer to delay payment. Thus, trade credit is also one of the benefits gained from supply chain. Previous studies on trade credit have focused on trade credit terms such as accounts payable and the number of days trade credit was granted or received (Van den Bogaerd & Aerts, 2015) and the discount terms (Ng, Smith, & Smith, 1999). In the case where trade credit is extended, the seller or supplier resumes responsibility for accessing credit risk, financing, and collecting receivables. Studies have shown that trade credit, through supply chain, is more likely to be extended if it is cheaper to supply both products and finance from a single source rather than through separate operations (Mian & Smith, 1992; Van den Bogaerd & Aerts, 2014). Trade credit also allows smoother deviations in sales by extending more trade credit when inventories rise and, thus, facilitates predictability of cash inflows (Kim & Choi, 2003; Paul & Boden, 2008). Additionally, trade credit may also be used to price discriminate between customers by offering higher cash discounts or by extending more trade credit (Meltzer, 1960; Mian & Smith, 1992; Paul & Boden, 2008; Petersen & Rajan, 1997). Mian & Smith (1992) in their study on managing receivables carried out comprehensive analyses of alternatives including the use of factors, accounts-receivable-secured-debt, captive finance subsidiaries, and general corporate credit.

Credit contracts between firms and lenders through the use of collateral are common. Broadly speaking, the presence of asymmetric information, adverse selection and moral hazard hampers the contractual relationship between borrowers and lenders, leading to credit rationing, and the risk of lending may be reduced by collateral (Voordeckers & Steijvers, 2006). Collateral will weaken the bank's incentives to evaluate the future prospects of new investment projects. Particularly for small firms, banks rely excessively on collateral and would do little screening. It can

be said that collateral and screening are considered as substitutes by banks. In the case of supply chain, warehouse receipts can be used as collateral for a loan (USAID, 2006). Receivables from well-known large firms are often better accepted as collateral, indicating a potential role for large firms in working with SMEs, which could be encouraged through appropriate programmes (Navas-Alemán, Pietrobelli, & Kamiya, 2015). Lehmann & Neuberger (2001) conducted a study based on 1,200 questionnaire responses from a survey of German banks in the year 1997 and found that borrowers with longer relationship pledge less collateral. This suggests that banks require lesser collateral from their preferred and trustworthy clients. Apart from that, since supply chain alliance improves a firm's collateral via warehouse receipt (USAID, 2006) or receivables (Navas-Alemán, Pietrobelli, & Kamiya, 2012), the firm thus have better creditworthiness via its collateral.

In developing countries, specialist agencies may provide guarantees but the guarantees may also come from suppliers and customers. Relationship finance in supply chain provides provision of guarantees on the basis of deep knowledge and trust that has developed between firms having a history of working together (Navas-Alemán, Pietrobelli, & Kamiya, 2012). Loan guarantees allows the partner-firm better access to financial services, and, in the case of credit default, the issuer of the loan guarantee will be held responsible for any liabilities. Guarantee systems are widely used in Argentina in certain industries and the Argentine government encourages such collaborations by providing tax exemptions to large firms that act as the guarantors of the loans (Navas-Alemán, Pietrobelli, & Kamiya, 2012). In Malaysia, there is evidence of a loan guarantee model with a donor or development agency acting as guarantor such as the Credit Guarantee Corporation (CGC).

Supply chain alliance is also thought to be able to reduce the learning curve of the SME when applying for loans and improve SME's ability to supply the necessary information via improved SME financial literacy and having better creditworthiness via its character, thus improving the time length for the loan to be approved and improving the chances of the firm to receive the money it needs. With the help of a large firm, small firms are in a better position to get better interest rates charged to

them compared to other small firms without linkage. Additionally, supply chain alliance may improve small firms' survival rate (Van Gils & Zwart, 2004) and business viability (Hoffmann & Schlosser, 2001). It makes them stay longer in the business and improves their profitability (Perry, Sengupta, & Krapfel, 2004), thus resulting in them having better access to finance via improved interest rates charged.

Previous research suggested that firms become more efficient, gain stronger competitive position through strategic flexibility and market power through strategic alliance (Dyer & Singh, 1998; Simsek & Heavey, 2016). Gaining competitive advantage would put a firm in a better market position as compared to the competitors in the same industry. Additionally, partnering with foreign firms is the success component of export ventures (Bloemer et al., 2013; Leonidou, Katsikeas, & Hadjimarcou, 2002). This suggests that firms with export ventures have a more diversified market and are less affected by the economic condition of a country. Apart from that, supply chain alliances are found to have long-term focus and cooperation among the supply chain members (Cooper, Lambert, & Pagh, 1997; Cooper et al., 1997; Prajogo & Olhager, 2012). Hence, firms in supply chain alliances have higher survival rates in the business, better viability and are able to sustain longer in the market. This thus improves the firms' creditworthiness via their condition due to their improved market position through the competitive advantage they gain.

Studies on the repayment behaviour of the borrower show that it is influenced by social ties (Hill, & Sarangi, 2012; Dufhues et al., 2011). Hill, & Sarangi (2012) found that the role of social ties in screening, monitoring and pressurising has an effect towards borrower repayment behaviour. The use of technology improves the repayment behaviour since technology is used as the medium of communication and serves as a reminder to repay the loan. This suggests that the large firms in the supply chain might play the role of screening, monitoring and pressurising the SMEs, and this may have an effect on their repayment behaviour as well as repayment performance.

There are also several studies on the borrower's character within the scope of group lending. Wen (2012) pointed out that in group lending the cost of dishonesty is high. They used the example where if one firm does not pay the loan on time, other members should liquidate jointly, and if group debt is not fully repaid, all group members will never be able to obtain future loans from the bank. This is aligned with Stiglitz (1990) who argued that group lending enables lending to those without collateral, thus alleviating the moral hazard issue. On the other hand, other researchers have also found that group lending can provide social guarantee and supervision (Sun & Im, 2015). The group members ensure monitoring and ensure that all members meet their end. The burden of the moral hazard problem falls on the monitoring members as they are responsible for repaying the defaulting member's loan (Banerjee, Besley, & Guinnane, 1994). Thus, pressure is put to the group members who pay late or default on their loans (Hill, & Sarangi, 2012). They show that higher penalties on a defaulting borrower imposed by the monitoring can cause increase in effort cost. To avoid penalties, safer projects are chosen by equalizing increased benefit and marginal costs of increased monitoring. Another set of studies which focuses on strategic default by group members (Besley & Coate, 1995) argued that without the threat of social sanctions, group lending may add little if any superiority over individual lending (De Aghion, 1999).

## 2.5 Theories

Based on the discussion of the possible linkage effects between large firms and SMEs, this study therefore mostly focuses on the Relational Network Theory (RNT) in explaining the effects of inter-firm collaborations.

The Relational Network Theory implies that idiosyncratic inter-firm linkages are the source of relational rents. Relational rents here refer to the super-normal profits jointly generated in an exchange relationship that cannot be generated by a firm in isolation and can be created through the joining of a specific alliance partner (Dyer & Singh, 1998). Additionally, the relational rent in this study also refers to ease of access



to finance, an advantage that an SME can obtain through its relationship with large firms (Navas-Alemán, Pietrobelli, & Kamiya, 2012; Rothwell & Dodgson, 1991). In isolation, SMEs without linkage may not gain the competitive advantage of improved access to finance compared to those with linkage.

In this study, the RNT theory would suggest a positive outcome for both creditworthiness and access to finance for SMEs with linkages to large firms. Relational rents gained from the reputation of the large firms and social capital via inter-firm linkage (Walter, Auer, & Ritter, 2006) will improve SME's access to finance while relational rents gained from inter-firm linkages via large trading volumes would improve the borrower's creditworthiness. Thus, this study adapts this theory to explain the effect on SME access to finance and credit worthiness.

It is said that relational rents are caused by relation specific assets, knowledge sharing routines, complementary resources and effective governance (Dyer & Singh, 1998). In relation to that, the effective governance gained from inter-firm linkages will improve firm performance and management capability via the knowledge sharing between the firms. Periodically, large firms conduct meetings where they share knowledge with their SME suppliers. SMEs gain operational and management skills as well as financing help from the large firms. Good and effective management also leads to better financial performance and "capacity". Thus, SME will be able to retain more earnings or accumulated "capital" of the firm. SMEs not only gain eased access to finance from their improved financial performance, but also financing help and financial monitoring from the large firm via group lending (Hill & Sarangi, 2012).

The relation specific assets gained from inter-firm linkage refer to the "collateral" of the firm. As SMEs forge relationships with large firms, they can make use of the large firms' credibility and reputation as its collateral. Often, large firms which are the parent company of SMEs become the guarantor or provider of financial backup for the small firms (Navas-Alemán, Pietrobelli, & Kamiya, 2012; Rothwell & Dodgson, 1991).



Apart from that, SMEs with linkage can access finance via group lending. Thus, when banks evaluate the borrower's creditworthiness, they take into account the borrowing "character" of the group (including large firms). The character aspect of the borrower now becomes better than the individual firm's loan. In group lending, each member of the group will monitor and work together to ensure that the other members play their part (Hill, & Sarangi, 2012) in order to maintain the level of creditworthiness of the group.

Relation specific assets also enable the SMEs to access the international market (Wong, 2011). Market diversification of the SMEs will enhance its economic "condition". Additionally, the credibility and reputation of the large firms it is linked to can provide these SMEs with competitive advantage to get financing during economic crisis, compared to those without linkage due to the fact that large firms will guarantee the repayment of the SMEs as the guarantor (Navas-Alemán, Pietrobelli, & Kamiya, 2012).

Although the RNT explains the positive outcome from the linkage towards SMEs' creditworthiness and access to finance, there are other factors that can distort the outcome that is anticipated. The pecking-order theory may be able to shed some light on this.

The Pecking Order Theory, which was initially proposed by Donaldson (1961), advocates the use of retained earnings instead of external funds due to the increased cost of financing as a result of increased asymmetric information. The owner-managers of SMEs will always see external financing as costly and hard to get without even trying to apply for loan as they are comparing the cost of financing between internal and external finance. Aside from this, internal finance incurs less cost but also involves less hassle in terms of documentation as explained by Mat Nawi (2015).

Additionally, following the Pecking Order Theory, firms are shown to have tendencies to shift to external finance from banks once cash flow from internal resources is exhausted (López & Sogorb, 2008; Sheng, Rani, & Shaikh, 2011) or vice

versa, which explain the substitutional effect. Therefore, SME may be in need of financing until they were able to generate more profit on its own and when the generated profit are able to sustain the financing need, they might switch to internal finance instead. When the SME have reached that point, there should be negative relationship between capacity and access to finance.

In conclusion, although RNT Theory would suggest an improvement in creditworthiness and access to finance, it may not get the result as anticipated according to the Pecking Order Theory and moral hazard. Nevertheless, the empirical test on moderating effect of inter-firm linkage was carried out to test this.

## 2.6 Gap in Literature & Research Framework

Previous studies have tackled the issue of supply chain or inter-firm linkages (Drew, 2003; Van Gils & Zwart, 2004; Giroud & Scott-Kennel, 2009; Hansen, 2006; Hong & Jeong, 2006; Wright et al, 2015; Ageron, Gunasekaran, & Spalanzani, 2012). However, the focus has been on the aspects of the relationship such as type of inter-firm linkage, issues and challenges in creating and maintaining the inter-firm relationship, factor in the selection of linkage partner, as well as supply chain management such as procurement, information and knowledge sharing and e-commerce. This study aims to explore how this relationship can enhance the access to finance, thus focusing on access to finance as the dependent variable or output of the study. This is quite similar to Navas-Alemán, Pietrobelli, & Kamiya (2012) study. However, theirs was a qualitative case study while this study is a quantitative (survey) one, enabling statistical analysis to be carried out.

A number of studies from Malaysia on inter-firm linkages or the supply chain are seen to focus more on its effect on research and development, knowledge transfer, supply chain management or technology collaboration from the linkage (Giroud & Scott-Kennel, 2009; Giroud, 2007; Hansen & Ockwell, 2014; Li, Zheng, & Wang, 2016; Chong et al., 2014; Zailani et al., 2012). These studies also focus on certain

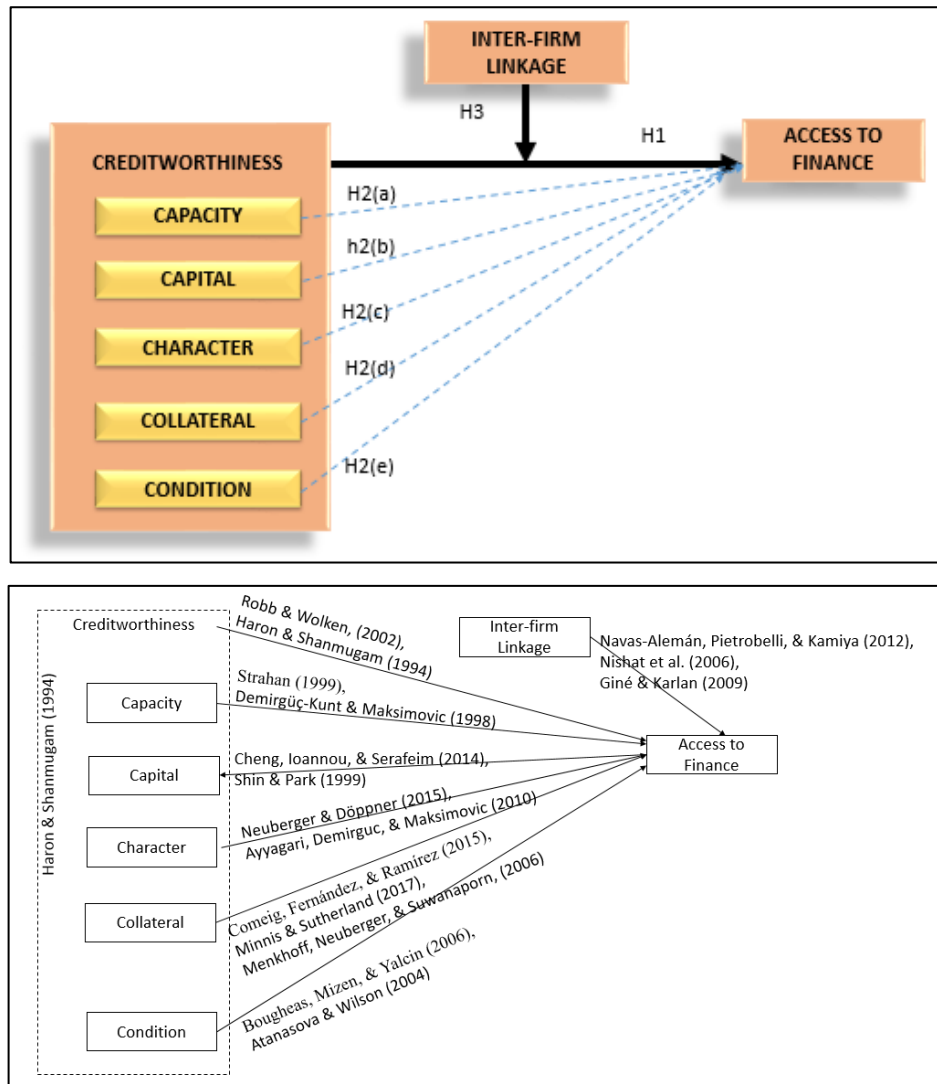
sectors in the manufacturing industry such as automotive and electric and electronics. This study on the other hand attempts to explore the manufacturing industry in general.

Apart from that, there are only a few studies on the topic of creditworthiness of a business in Malaysia. Harif, Hoe & Zali (2011) studied creditworthiness and the criteria that banks adopt when evaluating it. In contrast, this study sought to understand how SMEs perceive their creditworthiness via the 5C's by using the SMEs as the respondents. Since limited studies have been done with regards to access to finance and creditworthiness within the Malaysian context, there is therefore a need to pursue this topic.

Most of the studies with regards to supply chain have been focused on trade credit as the external finance (Chung, Cárdenas-Barrón, & Ting, 2014; Mahata, 2012; Pal, Sana, & Chaudhuri, 2014) while those that studied relationship finance focused on bank financing as the outcome for external finance (Drexler & Schoar, 2014; Moro & Fink, 2013; Uchida, Udell, & Yamori, 2012). However, the approach taken by this study is the interaction of the above as this study seeks to explore inter-firm linkage of supply chain with bank financing as the outcome of the external finance.

There are limited studies that have been conducted empirically with regards to access to finance and inter-firm linkages. Previous studies throughout the world have taken a qualitative approach when exploring these two where interviews were carried out with the SMEs to enable the researcher to have in-depth understanding of the financial instrument or lending innovations. Klapper (2005) for example, illustrated the use of factoring while Navas-Alemán, Pietrobelli, & Kamiya (2012) made a comparison of the financial sources and instruments used by SMEs in Argentina, Brazil and Costa Rica. Most empirical studies carried out with regards to access to finance have used secondary data and did not attempt to explain or study the inter-firm relationship. Thus, this study uses the quantitative approach on primary data in an attempt to test the framework.

As for the methodology used in assessing creditworthiness, reasonable effective methods have been developed over the years (Balcaen & Ooghe, 2006). However, these relational methods have been mostly replaced with the more objective transactional methods based largely on statistical analysis of annual financial statements (Balcaen & Ooghe, 2006). This is why the financial records of a firm are essential and must be provided in applying for financial credit. With the advent of new statistical methods in the 1960s, assessing the creditworthiness and health of businesses became automated and more objective (Altman & Sabato, 2007; Safi & Lin, 2014). However, Claessens & Tzioumis (2006) noted that while analysis of financial data may provide assessments of access to finance in the developed countries, it is of little use in the context of developing countries. This is due to the opaqueness of the information with regards to the borrower especially the SMEs. Thus, this study attempts to assess the SMEs' creditworthiness using the 5C's construct as proposed by Rose (2002) since these items are more constructive and cover most of what was found from Harif, Hoe & Zali's (2011) study which examined SMEs' creditworthiness in the Malaysian context. The instruments used for access to finance have been adapted from SME Corporation survey, European Central Bank survey and World Bank survey. As for the inter-firm linkage, the respondents were asked to indicate if they have linkage to any large firms. Based on the above arguments, the conceptual framework and the proposed theoretical framework for this study are depicted in Figure 2.1.



**Figure 2.1:** Theoretical & conceptual framework

In conclusion, very few studies in the past have tackled access to finance in tandem with creditworthiness and inter-firm linkages. Thus, there is a need for more research on the matter especially when it involves SMEs as they are the driver of economic growth, and contribute greatly to a nation’s economy. More knowledge on the matter can be gained from this study and SMEs, banks, and the government can equip themselves with the knowledge and make better decisions and processes with regards to SME financing.

Looking at the gap in literature as discussed earlier, the next chapter (chapter 3) discusses the research method and administration of the research. The discussion in the chapter clearly shows how this study is different from previous studies and provides contextual contribution as it studies the SMEs' creditworthiness in the perspective of SMEs and its access to finance.

## CHAPTER 3

### RESEARCH METHOD

This chapter starts with the hypothesis development based on previous literature, followed by research design, sample size, statistical power, measurement items and scales, pre-test and pilot study, and questionnaire administration. This chapter also discusses the response rate and data representativeness of the data. This is then followed by explanation of the reasons for using SmartPLS and finally, the last section discusses the PLS measurement analysis in detail.

#### 3.1 Hypothesis Development

Corresponding to the theoretical framework given in the previous section, the hypothesis are derived from the previous literature and guided through the research questions and research objectives.

Previous literature suggests both positive (Neuberger & Döppner, 2015) and negative (Robb & Wolken, 2002) relationship between creditworthiness and access to finance. Neuberger & Döppner (2015) studied 6,000 borrowers and 14,000 loan contracts in East Germany and found that loan rates decrease with soft information and loan rates increase with late payments. This implies that creditworthiness represented by soft information and repayment history have positive relationships with access to finance. The positive relationship between creditworthiness and access to finance is explained in terms of firms with lower credit scores (being new or have limited information on their credit history) being more likely to face financial constraints by having to pay higher loan rates. Firms with higher credit ratings are also less likely to change their main bank as they want to retain and maintain the bank relationship for better terms and improved access to finance for future financing. On the other hand, Robb & Wolken's (2002) study of 2692 non-Hispanic businesses in US in 1998 found that the more creditworthy a firm, the less likely it is to access external finance with

the Dun and Bradstreet credit score as a predictor of the likelihood of a business to go out of business, voluntarily or involuntarily. A firm with a good credit score would mean that it is less risky, has the cash flow from its sales and other income to pay its debt, the assets to provide as collateral and the ability to withstand adverse economic conditions, among others. It therefore also has more choices with respect to its financing needs. In contrast, previous literature explains the negative relationship as creditworthy firms being less likely to access external financing (such as trade credit) since it is believed that external finance is a more expensive source of finance.

**H1: An SME's creditworthiness has a significant positive relationship with its access to finance.**

Previous literature also implies both positive (Haron & Shanmugam, 1994; Nyamboga et al., 2014; Strahan, 1999) and negative (Demirgüç-Kunt & Maksimovic, 1998) relationship between capacity and access to finance. Capacity, which refers to the firm's capability in credit repayment, is associated with the firm's sales, other source of income and return on investment. Those with better income are deemed to be more creditworthy (Johnston & Morduch, 2008) thus better capacity leads to better access to finance. This is supported by Strahan (1999) who found that more profitable firms are able to borrow with better loan terms from the banks. Unfortunately, SMEs are known to lack capacity, and thus are only able to absorb small amounts of funds from financial institutions (Nyamboga et al., 2014). On the contrary, Demirgüç-Kunt & Maksimovic (1998) argued that although firms with supernormal profits are capable of credit repayment, they are also able to finance their growth internally (using retained earnings). The usage of external finance by capable firms is based on the accessibility, the cost of external finance and the availability of internal funds. Thus, profitable firms are less likely to access external finance. This results in a negative relationship between capacity and access to finance.

**H2a: An SME's credit capacity has a significant positive relationship with its access to finance.**



The relationship between a firm's capital and access to finance can be positive (Green, 1992; Christiano et al., 2005; Cheng, Ioannou, & Serafeim, 2014) or negative (Shin & Park, 1999). Capital symbolises the owner's control and it has a positive effect on managerial motivation to "put up a fight" during challenging times, rather than submitting to defeat (Green, 1992) which translates into lower default risk. Aside from that, capital utilisation enables firms to cushion against financial shock (Christiano et al., 2005). Christiano et al., (2005) through their model, showed that the higher the firm's or owner's capital, the lower the default risk borne by the banks and the more creditworthy the firm is. Firms with high capital position should have better access to finance due to their low default risk and are thus favoured by the lenders. Apart from that, better access to finance also lowers the capital constraints that the firm is facing (Cheng, Ioannou, & Serafeim, 2014). A positive relationship between capital and access to finance is expected. On the other hand, Shin & Park (1999) suggest a negative relationship between capital and access to finance since a firm's excessive reliance on internal finance is due to 1) its inability to access external finance, and 2) the substitutional effect between capital and access to external finance.

**H2b: An SME's capital has positive relationship with its access to finance.**

Previous literature implies a positive relationship between borrowing character and access to finance (Ayyagari, Demirguc, & Maksimovic, 2010; Boot & Thakor, 1994; Haron & Shanmugam, 1994; Minnis & Sutherland, 2017). Banks impose stricter requirements, screening and longer processing time for loan approval towards borrowing firms that have defaulted on their payments previously (Comeig, Fernández, & Ramírez, 2015). Financial reporting is mostly used as the monitoring device. An SME's credit history or reputation can ease its access to finance since most lack track records, which is one of the reasons for loan rejection (Minnis & Sutherland, 2017). Having good credit history signals a strong character which thus enhances SMEs' access to finance (Ayyagari, Demirguc, & Maksimovic, 2010). This is reflected through lower cost of financing (Boot & Thakor, 1994). In fact, character is said to be

the main factor for the banks to make lending decisions when it comes to Malaysian SMEs (Haron & Shanmugam, 1994). According to a survey conducted by Inti International University in collaboration with SME Media Group, 73% of business operators think that making late payments is a business culture in Malaysia (The Star, 2016). This has put Malaysian SMEs in a very challenging situation as they have to put up “good borrowing character” in the eyes of the banks where they have to endure months without payments from their partners and yet, they need to pay their loan obligation on time.

**H2c: An SME’s character has a significant positive relationship with its access to finance.**

Previous literature also found both positive and negative relationships between collateral and access to finance (Chan & Kanatas, 1985; Comeig, Fernández, & Ramírez, 2015; Haron & Shanmugam, 1994; Minnis & Sutherland, 2017). Collateral can be one of the factors that influences the banks’ decision to grant loans to Malaysian SMEs (Haron & Shanmugam, 1994). Collateral is very powerful as a higher collateral pledged can reduce demand for financial reporting (Minnis & Sutherland, 2017). Chan & Kanatas (1985) also suggest a positive relationship between collateral and access to finance since low loan interest rates depend on the amount of collateral the applicant submits. This is later proved by Comeig, Fernández, & Ramírez (2015) who found that pledging higher collateral enables borrowers to get lower interest rates.

On the other hand, SMEs with higher build-up collateral can be at a disadvantage as they may face certain constraints such as being locked-in by their house bank, having reduced power of negotiation during financial distress, and face restrictions in dealing with other lenders (Elsas & Krahnén, 2000; Menkhoff, Neuberger, & Suwanaporn, 2006).

**H2d: An SME’s collateral has a significant positive relationship with its access to finance.**

Atanasova & Wilson (2004) and Bougheas, Mizen, & Yalcin (2006) found that monetary condition influences access to external finance, implying a positive relationship between condition and access to finance. As the monetary condition is tightened, the availability of loan decreases while the demand for loan increases. This is also supported by Korajczyk & Levy (2003) who suggest that economic slowdown affects the borrower's balance sheet and financial constraints. Firms shift their model of capital structure accordingly during economic slowdown and this is captured through their balance sheet. Although economic slowdown has an effect of financial constraints on borrowing firms, the firms take what they can get. All these refer to the external condition which is outside of SMEs' control which can influence their access to finance.

**H2e: An SME's condition has a significant positive relationship with its access to finance.**

Navas-Alemán, Pietrobelli, & Kamiya (2012) suggested that linkages between SMEs and large firms can work as a possible solution to reduce the financing problem faced by the SMEs. The relationship between creditworthiness and access to finance may change depending upon the linkage an SME has with large firms. This is explained via the Relational Network Theory (RNT). The difference is due to the relational rents gained from the linkage. The spill over effect from the partner's credibility and reputation will put the SMEs in better chance of getting access to finance. The supernormal profit generated from the inter-firm linkage through increased sales volume, market access, and product diversification can enhance the SME's business condition. On top of that, SMEs can name their partner as their guarantor when applying for external finance. Inter-firm linkage also allows the SMEs to borrow via group lending. Group lending can overcome information asymmetric which is often associated to SME lending. Strong inter-firm linkages are hoped to alleviate the problem of late payments by partners by encouraging the partner (large firms) to pay on time, as part of their corporate social responsibility as well.

SMEs profit by gaining huge volume of sales from inter-firm linkage (Lenny et al., 2007) as well as asset sharing (Björnfot & Torjussen, 2012), and support and assistance (Sousa & Bradley, 2009). However, SMEs may have strong dependency on their partner (Nishat, Banwet, & Shankar, 2006) and this can lead to worsening access to finance as it adds to the SMEs' overall risk on factors associated with the partners such as changing political or economic situation, formation of new alliances, takeovers, mergers and acquisitions (Nishat et al., 2006). Thus, inter-firm linkages can also hurt SMEs' access to finance. Giné & Karlan (2009) listed some of the pitfalls of group lending such as 1) group liability can cause tension which leads to voluntary dropouts and harms social capital among members, 2) bad borrowers may "free ride" off good borrowers which can cause rising default rate (associated with moral hazard), 3) group lending is costly for good risk borrowers as they are often required to repay the loan of their peers, and lastly, 4) heterogeneity in demand for credit (loan sizes) could result in tension where borrowers with smaller loans are reluctant to be the guarantors for those with larger loans.

It is hypothesized that the linkage between SME and large firms moderates the relationship between SME's creditworthiness and its access to finance.

**H3: Inter-firm linkage between an SME and large firms moderates the relationship between an SME's creditworthiness and its access to finance.**

### 3.2 Research Design

According to Claessens & Tzioumis (2006), research on the determinants of access to finance is divided into two categories: (1) analysis of corporate financial data, and (2) use of survey data to directly assess access to finance. However, the assessment using financial data is of little use in the context of developing countries due to the limited availability of financial data for SMEs. Apart from that, the character of a borrower is as important factor that banks look at when giving financing especially for

SMEs, but financial performance captured through financial statement lacks this factor. Hence, this study assess the creditworthiness of the borrower using the 5C's of creditworthiness concept. The 5C's can be captured using surveys which are sent to the SMEs. When asking SMEs to rate themselves with respect to their creditworthiness, there may be biases as the SMEs may tend to over-rate themselves. It would be ideal if the banks which the SMEs deal with could provide the credit score for each SME but it is not possible to obtain these information from the banks as this is against the Malaysian Financial Services Act 2013. Therefore, creditworthiness in this study is assessed based on the perception of each SME respondent regarding their company's creditworthiness.

This study is an empirical one since there are a substantial number of previous studies which have performed qualitative analysis on a firm's creditworthiness. For example, Harif, Hoe & Zali (2011) gathered information from 7 banks in Malaysia through convergent interviews with regards to the factors that banks take into consideration when deciding whether to approve or deny loan applications. This study further investigates how creditworthiness affects the access to finance of an SME. Through their qualitative study, Navas-Alemán, Pietrobelli, & Kamiya (2012) proposed linkages between SMEs and large firms as a possible solution to reduce the financing problem faced by the SMEs. Therefore, this study also investigates the influence of inter-firm linkages in moderating the relationship between an SME's creditworthiness and its access to finance. Data collected from this study were analysed via descriptive statistics as well as inferential statistics while an exploratory study was conducted to investigate the relationship between the variables.

This study's sample unit is firms. This means that for every ONE firm, only one response is gathered from that firm. Past studies showed that responses from the organisational level are significantly lower than the individual level (Baruch & Holtom, 2008). Thus, this is one of the challenges of this study as this study focused on organisations rather than individuals. The sample was carefully chosen by first developing the sample frame. This study chose firms that are only in the SME category, i.e. they are either micro, small or medium enterprises, and they belong to

the manufacturing industry located in Selangor and the Federal Territory of Kuala Lumpur area. Using the Federation of Malaysian Manufacturer's (FMM) directory, manufacturing firms located in the Selangor and the Federal Territory of Kuala Lumpur areas were screened. The Selangor and the Federal Territory of Kuala Lumpur were chosen because the SMEs which have linkages with large firms are mostly located in these two areas. Location is one of the 'right' criteria in the selection of suppliers in supply chain management (Ageron, Gunasekaran, & Spalanzani, 2012). Since delivery of the products is performed quite frequently and to minimise transportation cost, the SMEs are usually located near the large firms' warehouses or factories.

The FMM directory is widely used in Malaysia (Alshammri, 2013; Bidin & Marimuthu, 2014; Haron et al., 2010). However, the FMM directory does not provide information on whether or not the firm belongs in the SME category. Thus, cross checking between the FMM list and the SME list obtained from the website of the SME Corporation was carried out. However, through this it was not possible to determine only the SMEs which had links with large firms. Therefore, the SMEs studied may or may not have links with any large firms. The final population size of this study is 456 firms.

The respondents for the study are the representatives of the firms who are from the finance department. Due to low response rate from respondents who are in the managerial positions such as the Director, Chief Executive Officer (CEO), or financial manager, this study also accepted responses answered by finance officers who are aware of the finance practices of the SME and are able to provide information about the creditworthiness of the SME. It should be noted that this study did get responses from finance managers, but the responses were very limited. The 'Seven R' challenge is undeniably one of the more profound challenge in SME research. The Seven R's involve "the challenge of contacting the right person with the right information at the right time in order to ask the right questions using the right instrument for the collection of the right data at the right cost" (Walton, 1997, p. 221). In this study, some SMEs did not have finance departments. Thus, data from representatives of the accounting

departments were also accepted and analysed. The worst-case scenario was that some of the firms employ staff with no clear-cut job descriptions and therefore the employees acquire high levels of multi-tasking. This happens mainly due to the unique organisational structure of the SMEs. As an example, in some firms without any accounting or finance department, the human resource (HR) employee or administrative employee is also required to carry out the accounting and finance function, such as financial reporting, payroll and inventories. This information was provided to the researcher during personal visits to the SMEs where clarification was provided regarding the individual firm's organisational structure and that the survey was given to respondents with knowledge of the finance function within the firm.

Questionnaires were distributed to the SMEs around Selangor and the Federal Territory of Kuala Lumpur area. The questionnaires were distributed and collected by hand or using the face-to-face approach where visits to each of the firm's office or factories were conducted to distribute the questionnaires. Calls were later made for follow-ups and pre-notification (suggested by Larson & Poist, 2004). The next visit was made in order to collect the completed questionnaires. Some firms insisted that appointments be made via email and a softcopy of the questionnaire sent out to them before the visit as any unauthorized visits are not permitted. Some of the reasons provided by the SMEs for non-response were that they were too busy, that they had no time for filling up questionnaires and that they have received too many surveys. These reasons are expected in survey-based research as Kaner, Haighton, & McAvoy (1998) explained.

Due to the small population of this study as well as the low response rate, the over-sampling approach was used where the questionnaires were distributed until minimum sample required (refer to sub chapter-sample size) was achieved. However, the total number distributed ended up approaching the population size (all the companies in the sample frame). Table 3.1 provides a summary of the research design of this study.

**Table 3.1:** Summary of research design

<b>ITEMS</b>	<b>DESCRIPTIONS</b>
Nature of study	<i>Empirical study (descriptive and inferential study)</i> <i>Exploratory (relationship between variables)</i>
Sample Unit	Firms (SME)
Sample Criteria	-Firms under the SME categories (micro, small and medium) -Firms in the manufacturing industry
Sample frame	456 firms from the FMM & SME list from SME Corp.
Geographic scope	Selangor & Federal Territory of Kuala Lumpur
Sampling method	Over- sampling
Method of collection	Pencil and papers questionnaire

### 3.3 Sample Size

There is a lot of debate with regards to sample size, and even more so when Structural Equation Modelling (SEM) is employed. Sekaran (2003) suggested that a sample size of more than 30 and less than 500 shall be appropriate for most studies as a general rule of thumb. Bartlett, Kotrlik, & Higgins (2001) and Hair et al. (2006) on the other hand, suggested a sample size of more than 100 while Anderson & Gerbing (1988) and Bagozzi & Yi (1989) suggested a minimum sample size of 100 to 150. Some suggested any number above 200 as sufficient (Hoe, 2008) while a sample size of below 50 is not recommended (Hair et al., 2006). Thus, in this study, data consisting of 154 responses met the said requirement.

Apart from those mentioned above, there is also the 10 times rule of thumb by Hair et al. (2013). Using these methods, the model consisted of a total of five variables, with 6 arrowheads pointing to the latent variable. Thus, this method required a minimum of 50 respondents (5 arrowheads pointing at a latent variable in PLS path



model x 10) to conduct this study. It is important to note that all these are only a rough estimation of the minimum sample size. A more accurate estimation should be done using statistical power analysis with the largest number of predictors (Roldán & Franco, 2012).

### 3.4 Statistical Power

Based on the guidelines to determine the minimum sample size given by (Cohen, 1992), with effect size of 0.15, alpha of 0.10, statistical power of 0.80 and five predictors, the study required a sample size of 75. Power is the probability that a test correctly rejects a false null hypothesis. In this case, there is an 80 percent chance to reject the null hypothesis when it is false. A much larger sample size is needed to reduce the confidence interval of the estimate to avoid any type I error. The alpha of 0.10 was chosen for this study (instead of 0.05) because the research area is new and the researcher is interested in, “identifying marginal relationships, differences or other statistical phenomena as a precursor to further studies” (Bartlett, Kotrlik, & Higgins, 2001).

### 3.5 Measurement Items and Scales

The questionnaire and its scaling were adapted and adopted based on previous literature. A five (5)-point Likert scale was used in most of the questions to enable quantitative analysis to be performed from the given response.

Items used to measure the creditworthiness were adapted from previous literature (Harif, Hoe & Zali, 2011; Berger & Schaeck, 2011; Love & Mylenko, 2003; Harvey, Macht & Sharma, 2012; Bartoli et al., 2013; European Central Bank Survey, 2014; Claessens & Tzioumis, 2006; Haron & Shanmugam, 1994; Rose, 2002). Apart from that, interviews were conducted with representatives from two banks to make sure that the items were suited to the Malaysian context and to ensure important things

were not being left out. During the interview session, the banks' representatives were asked regarding the criteria of the SME that is being evaluated for loan approval. The bank representatives were also asked about any distinct characteristic which surfaced with regards to access to finance, issues related to SME financing and challenges faced by these SMEs. The results were taken as the items for creditworthiness since these are the criteria that the banks impose to indicate the creditworthiness of a loan applicant when applying for corporate loans. Previous literature used mathematical formula (Altman's Z-score Plus formula) to calculate the creditworthiness of a firm (Altman & Sabato, 2007; Benhayoun et al., 2013). However, in this case, it is less relevant as Malaysia is yet to have public, secondary SME data for the calculation of creditworthiness using the mathematical formula.

The items or questions used to measure access to finance were based on the definition given by Claessens (2006) which has been cited by many other literatures. The questions for creditworthiness were adapted from many sources or references. The references were from textbooks, surveys as well as journal articles. All items for the construct of access to finance and creditworthiness (including Capacity, Capital, Character, Collateral and Condition) were standardized into a 5 point Likert-scale ranging from (1) strongly disagree to (5) strongly agree (Sekaran & Bougie, 2010, p152). This was to allow for sufficient response choice without increasing respondent's burden (Moser, 1971). The odd number of response choices allowed for equivocation (DeVellis, 2016). The use of Likert-scale is a common mechanism to measure and operationalise a latent construct (Kent, 2001). Each construct had multiple items or indicators. The use of multi-item constructs were chosen to avoid the pitfalls of using a single item construct (Nunnally, 1978; Peter, 1979). The authors criticised the use of single item constructs as they lack sufficient correlation, are closely related to other attributes, have restricted variance of scale and result in unreliable responses. The questions in the questionnaire were as short and simple as possible for the respondent's convenience and better understanding and to encourage better response (Larson & Poist, 2004).

The data in this study are regarded as interval data. Previous literature pointed out that Likert-scale should be treated as ordinal scales (Nunnally & Bernstein, 1994). However, most of the studies based on Likert-items and scales treat them as interval scale and analyse them using descriptive statistics (such as means and standard deviation) and inferential statistics (like correlation coefficient, factor analysis and analysis of variance). Several studies have also shown that the Likert-scale can be analysed effectively as interval scale (Ezemonye & Emeribe, 2014). Allen & Seaman (2007, pg. 2) also support treating Likert scales as interval data as “the “intervalness” is an attribute of the data, not of the labels” and the authors also suggested that the scale item should be at least of five categories. Table 3.2 summarises the items, constructs, type of constructs, scale and references.

**Table 3.2:** Summary of construct, type of variable and scales

Construct	Type of variable	Scale
Access to finance	Dependent variable	5-point Likert-scale
Creditworthiness (higher order- measured by 5C's)	Independent variable	5-point Likert-scale
Capacity		
Capital		
Character		
Collateral		
Condition		
Legal status		
Firm size	Ordinal scale	
Firm characteristics	Nominal scale	
Education level	Ordinal scale	
Firm's age	Ordinal scale	
Sector	Nominal scale	
Loan application	Dichotomous	
Linkage	Demographic variable/ Moderator	Dichotomous

Table 3.3 lists the items used to measure access to finance (dependent variable), capacity, capital, character, collateral, and condition (the elements of creditworthiness). Access to finance consists of 8 items, capacity 7 items, capital 7 items, character 11 items, collateral 12 items, and condition 14 items. It also enlists the references with regards to each item.

**Table 3.3:** Summary of items and references

<b>ACCESS TO FINANCE</b>		
1	Financial services are easily available to us when needed/desired.	Claessens (2006)
2	Financial services are easily accessible to us.	Claessens (2006)
3	The size of loan available is sufficient to meet the needs of our company.	Claessens (2006)
4	The total cost of accessing to the financial services is low.	Claessens (2006)
5	There is a wide range of financial services available to us.	Claessens (2006)
6	The quality of financial services offered to us is very good.	Claessens (2006)
7	Our company is able to access finance repeatedly.	Claessens (2006)
8	The financial products available/offered are tailored to the needs of our company.	Claessens (2006)

Creditworthiness (measured by five dimensions of 5C's)

<b>CAPACITY</b>		
1	Our firm is able to handle our debt capacity.	Berger & Schaeck (2011)
2	Our firm successfully manages our payments/commitments in the past.	Love & Mylenko (2003)

3	Our firm has other assets that can be liquidated/sold.	Harif, Hoe & Zali (2011)
4	Our firm is able to repay our debt.	Harif, Hoe & Zali (2011)
5	Our firm's owners have manageable personal financial commitment.	Harif, Hoe & Zali (2011)
6	Our firm has strong cash flows & financial viability.	Harif, Hoe & Zali (2011)
7	Our customers, guarantors, suppliers are legit.	Rose (2002)

<b>CAPITAL</b>		
1	The owner(s) have invested huge capital (financial commitment) in the firm.	Harvey, Macht & Sharma (2012)
2	Our past and projected cash flows are adequate.	Rose (2002)
3	Our firm record shows strong past earnings, dividends, and sales.	Rose (2002)
4	Our firm has adequate liquid reserves.	Rose (2002)
5	Our firm has high turnover of payables, account receivables & inventory.	Rose (2002)
6	Our firm has good and effective management team.	Rose (2002)
7	Our firm has good control over our expenses.	Rose (2002)

<b>CHARACTER</b>		
1	Our firm has good past payment record.	Rose (2002)
2	Our firm has never defaulted our loan/debt.	Rose (2002)
3	Our firm's owners have never defaulted on their personal loan.	Rose (2002)
4	Banks are willing to provide credit to our firm.	Harvey et al. (2012)
5	Business partners are willing to provide credit to our firm.	Harvey et al. (2012)
6	Investors are willing to invest in our firm.	Harvey et al. (2012)

7	Other lenders have good lending experience with us.	Rose (2002)
8	Our firm is able to provide many guarantors/referrals.	Rose (2002)
9	Our firm maintains good long-term relationships with our suppliers.	Bartoli et al. (2013)
10	Our firm has good credit rating.	Rose (2002)
11	Our firm has good track record in forecasting business income.	Rose (2002)

<b>COLLATERAL</b>		
1	Our firm is able to provide required collateral.	European Central Bank Survey (2014)
2	The value of our collateral is high.	Harvey et al. (2012)
3	Our firm is able to provide guarantors as per bank requirement.	Harvey et al. (2012)
4	Our firm owned most of our assets (land, buildings, vehicle, machinery, equipment).	Rose (2002)
5	Our assets are less vulnerable to be obsolescence.	Rose (2002)
6	The liquidation value of our asset is high.	Rose (2002)
7	Our assets require low degree of specialisation.	Rose (2002)
8	Encumbrances and restrictions against our property held are low.	Rose (2002)
9	Leases and mortgages issued against property and equipment are small.	Rose (2002)
10	Guarantees and warranties issued to others are small.	Rose (2002)
11	Banks have high relative position as creditor in placing claim against our assets.	Rose (2002)
12	Our firm has low probable future financing need.	Rose (2002)

<b>CONDITION</b>		
1	Our business and business industry is less sensitive to business cycles and changes in technology.	Rose (2002)

2	The competitive climate for our product is low.	Rose (2002)
3	Our firm has a good firm-specific outlook with respect to sales, profitability or business plan.	Harvey et al. (2012)
4	Our business has growth potential.	Harvey et al. (2012)
5	There is a huge demand for our product.	Harvey et al. (2012)
6	Our product remains relevant & feasible in the future.	Harvey et al. (2012)
7	Our firm often gets credits from suppliers.	Harvey et al. (2012)
8	Our firm's sales are not dependent/concentrated on any particular customer.	Harvey et al. (2012)
9	Our firm holds a strong position in the industry.	Rose (2002)
10	Our performance is better than other firm in the same industry.	Rose (2002)
11	Our business has a good industry outlook in the long run.	Rose (2002)
12	Regulations, politics and environment have little effect on our business.	Rose (2002)
13	The labour market highly available for this industry.	Rose (2002)
14	Inflation has small impact to our balance sheet and cash flows.	Rose (2002)

### 3.6 Pre-test and Pilot Study

Before the survey was distributed to the respondents, face validation was conducted with three academicians, representatives from two banks (a private entity and a government bank) and two SMEs. This was to ensure that the questions asked were relevant to this study especially with regards to each variable and topic of interest as well as applicability to the SMEs in the given sector. Additionally, it was to ensure that the items used were good measurements that would enable the respondents to relate to their situation and also to ensure that the respondents have no difficulties with the financial terms used in the survey.

The three academicians who reviewed the questions have knowledge in finance and management and have experience in developing questionnaires and conducting interviews. The representatives from the two banks have been working for more than four years in the banking industry. One of them specialises in the local SME segment while the other is a manager of a foreign bank, managing a branch in Kuala Lumpur and specialises in business loans. The two SMEs chosen for face validation operated in the Selangor area. One of them is an entrepreneur operating in Banting and produces food and beverage products and just started the business less than two years ago while the other is located in Shah Alam (also in Selangor) and produces automotive parts and has been operating for more than five years and has four subsidiaries.

The questionnaire was given to them and they were asked to fill it up. Comments and feedbacks were requested. The respondents were also asked if any of the terms used in the survey needed clarification. One of them suggested changing from having the respondents' write down the answer (ratio scale) to selecting the answer based on choices provided (ordinal scale) for the question identifying the respondent's SME status, which requests information on revenue and number of employees as she thought that some respondents may not be willing to reveal the information as it may be considered as private and confidential to the firm. Apart from that, 15 questions were dropped due to ambiguity and repetition as suggested by the respondents during the pre-testing. The adjustment was carried out accordingly. No adjustment was made thereafter.

Past studies in Malaysia have used the method of referring to experts in determining the content validity of the survey instrument (Abdullah, Che-Ros, & Kumar, 2009; Hasan et al., 2011). The pre-testing was done in the early month of August 2015 until middle of January 2016. This was due to the number of adjustments made to the questionnaire during the period of pre-testing.

Balian (1994) recommends a pilot study on the basis that it provides the researcher a full review of the questionnaires, respondents and actual test administration. Thus, a pilot study was conducted as it provided the feel of the data



and the opportunity to objectively measure validity and reliability of the instrument as discussed earlier in the validity and reliability sections. The pilot study was performed at a gathering event conducted by one of the anchor firms. Due to the low response rate highly reported by studies in Malaysia, the 30 responses gathered from the event were used for the purpose of the pilot study. Cronbach alpha values were used to decide which items were to be dropped and which were to be kept.

The responses used for the pilot testing are sufficient as Cooper & Schindler (2003) suggested 25 to 100 respondents for pilot testing. Reliability test was conducted and Cronbach alpha values for all the constructs were more than 0.6 (after deleting nine items), which is the cut off suggested by Boyer & Pagell (2000). The purpose of a reliability analysis is to determine whether the items that measure a particular construct can be grouped together (Pallant, 2007). The results of the reliability analysis on the pilot study data is provided in Table 3.4.

**Table 3.4:** Results of Reliability Analysis for Pilot Study

<b>Variable</b>	<b>Cronbach's Alpha</b>	<b>Items remained</b>
Collateral	0.789	collateral1, collateral2, collateral3, collateral4, collateral9, collateral11
Capital	0.794	capital1, capital2, capital3, capital4, capital5, capital7
Condition	0.599	condition3, condition4, condition5, condition12, condition14
Character	0.778	character2, character3, character4, character6, character7, character8, character10
Capacity	0.817	capacity1, capacity2, capacity3, capacity4, capacity5, capacity6
Creditworthiness	0.830	All 30 items in 5C's
Access to finance	0.880	All 8 items

### 3.7 Questionnaire Administration

The designed questionnaire was attached together with the cover page (with Multimedia University, MMU logo) on the front page. The cover page gave a brief explanation with regards to the study, the importance of participating in the survey, and researcher's contact details (if there were any questions or clarifications needed from the respondents). The Dillman's Tailored Design Method of the "sharpshooter" approach was used where a well-designed questionnaire perfected by pre-test was sent and approach was institutional or university and the respondents were given a dateline with follow-up and pre-notification given prior to the distribution and collection of the survey (Larson & Poist, 2004). The researcher's contact details also allowed the respondents to choose on the method of returning the completed questionnaire. Respondents may choose one of the three options to return the completed question, namely to 1) scan and email them, 2) mail them through post or 3) call to inform the researcher that the questionnaire is ready to be collected. The full questionnaire is provided in Appendix 1.

With regards to questionnaire distribution, previous literature has shown that in the studies on Malaysian manufacturing firms in various disciplines, when mailed surveys were used, there is a low response rate which ranged between 8%-25% (Abdullah, Che-Ros, & Kumar, 2007 [17%]; Kuen, Zailani, & Fernando, 2009 [20%]; Maelah & Ibrahim, 2007 [8.6%]). Due to the low response rate of mailed surveys, the researcher chose to hand in the questionnaire personally by visiting the companies listed in the sampling frame. It was hoped that by doing this, the response rate was better than mailed surveys as the process of follow-ups with the respondents can be improved. This is because the personal approach allows the researcher to capture the name, position and contact details of the person who receives the survey. This can greatly improve the process of follow-ups later on.

The follow-ups or reminders were sent on a weekly basis with a total of 7-8 reminders to the firm or until the firms firmly expressed their inability to commit to the survey. A follow-up on a firm may take 2-3 months and was carried out

simultaneously with other firms located in the same area and was also dependent on the holidays and festive season. A firm's end-of-year closing of accounts and audit periods may put pressure on the finance officer of the firm, thus more time was given for them to fill up the survey if the survey was distributed during the firm's auditing month. A more frequent follow-up carried out during this period of closing ends and audit may worsen the response rate as they might get annoyed and decide not to participate in this study.

Upon follow-up, pre-notifications and reminders were sent from time to time via phone calls (as suggested by Diamantopoulos & Schlegelmilch (1996)). Some respondents reported that they did not receive the questionnaire. Thus, questionnaires were re-sent to them for the second time. Some requested the questionnaire to be re-sent via email but the response rate was extremely low for this, as some of the email addresses given had failure notifications or non-responses. Therefore, whenever possible, the researcher preferred to re-send the questionnaire by hand to enable face to face meetings with the respondents so that information of the person who received the questionnaire such as name, phone number and department can be obtained and a dateline can be set between the researcher and the respondent.

Some firms refused to participate and gave explanation for their non-response. Some of them stated that information related to the finance part was strictly private and confidential. Some stated that filling up any surveys was against the firm's policy (Baruch & Holtom, 2008; Diamantopoulos & Schlegelmilch, 1996) while some firms requested the researcher to show the student card as proof of being a student to ensure that the information disclosed would be used strictly for academic purposes. Some firms also required appointments to be made and requested the survey to be emailed. However, the response rate from this "appointment" method was also low as they tend to decline later on via phone calls.

With regards to data collection, some of the responses were returned via emails (scanned) but majority of the firms gave a call to inform the researcher to collect the responses. Some firms mailed their answer through post even though stamped

envelopes with return addresses were not provided (Diamantopoulos & Schlegelmilch, 1996).

Whenever possible, before approaching the finance officer, the researcher would approach the Human Resource (HR) personnel first as this is a common approach in management research (Welbourne & Andrews, 1996). This is because the more people that the survey went through, the better the process of follow-ups. For example, when the researcher called the finance officer and the finance officer informed that he/she did not receive any questionnaire, follow-up with HR or the receptionist can always be done. This is in-line with Helgeson, Voss, & Terpening (2002, p. 305): *"The most effective factors (for response inducement) include an enclosed monetary incentive and the number of contacts made"*. Query on the progress of the survey was also carried out and the respondents were asked if there were any problems arising that prevented them from passing the questionnaire to the finance officer. Additionally, the HR personnel and/or the receptionist were more cooperative and helpful as compared to finance officers. They helped by finding a cooperative finance officer who was more willing to help as compared to giving the survey to a random finance officer.

Data collection commenced on Jan 21<sup>st</sup>, 2016- June 30<sup>th</sup>, 2016 and it consisted of distribution of survey, collecting answers, and keying in of data simultaneously. Due to the low response even through this method, there was the possibility that minimum sample size may not be secured. Thus, the surveys were further distributed on a larger scale and the researcher ended up distributing the questionnaire to the entire population of the study. The distribution of the surveys was carried out according to the area or locality of the firms such as Rawang, Sg. Buloh, Klang, Shah Alam and Puchong area.

### 3.8 Response Rate & Data Representativeness

All 456 firms listed in the sample frame were approached for this study (due to low response rate, over-sampling was used in order to achieve the minimum required sample size in GPower). 158 responses/answers were returned. This resulted in a response rate of 34.6% for this study. Thus, the data was considered sufficient for the purpose of this study. However, from the total returned, only 145 were usable as 13 responses were excluded due to multivariate outliers, missing values on demographic variables and unreliability of the answers.

A study by Abdul-Aziz, Chan, & Metcalfe (2000) on quality practices in the manufacturing industry in UK and Malaysia had a response rate of 33.3% which is quite similar to this study. Apart from that, a study on the Malaysian automobile industry had a response rate of 37.7% (Aznur Hajar & Ab Hamid, 2008). Thus, the data of 145 was considered sufficient for this study given that the population was small and the target population was business organisations. Moreover, the minimum sample requirement from GPower was achieved.

### 3.9 Reasons for Using SMARTPLS

Although the use of AMOS (Analysis of Moments Structures) which performs the Covariance Based Structural Equation Modelling (CBSEM) has been widely used by researchers, Partial Least Square (PLS) was used due to several of its advantages.

First of all, there are less demanding conditions for sample size, independence and normality imposed by PLS (Hair et al., 2013). Indeed, a study by Reinartz, Haenlein, & Henseler (2009) shows that PLS requires only about half as many observations to reach a given level of statistical power as does CBSEM when it comes to prediction and theory development. This is the main reason for choosing PLS over CBSEM in this study since there are only a small number of companies (456) in the sample frame which fulfil the requirements (SMEs from the manufacturing industry located in the area of Federal Territory of Kuala Lumpur and Selangor). Due to the

low response rate, the study only managed to collect (154) responses. A sample size of at least 200 is proposed by Hoelter (1983) in order to make an accurate assessment of model fit when using CBSEM. PLS, on the other hand, is generally workable with smaller sample sizes (Gefen, Straub, & Rigdon, 2011) and when assumption of normality is in doubt. This is due to the fact that PLS uses the original sample to estimate the model's parameters as it uses re-sampling method (bootstrapping function) to calculate the confidence interval of the model parameters. Running the data using PLS seems to be a better choice rather than with CBSEM.

Apart from that, PLS is able to handle both formative and reflective variables (Bollen, 2011) and has an advantage over a new investigation or study area where measurement items are newly developed (Anderson & Gerbing, 1988). This is supported by Chin & Newsted (1999) in that the PLS approach is more suitable when the phenomenon under research is relatively new or changing or when the theoretical measures are not well formed. This is important in this study as the measurement items were gathered from a handful number of journals and surveys while some sentences were formed based on keywords provided in previous literature.

In conclusion, PLS definitely has an advantage as it can explicitly recognise measurement errors while in AMOS errors need to be represented. This was of great help and convenience to the researcher when carrying out the data analysis.

### **3.10 PLS Measurement Analysis**

With regards to PLS, a number of analyses need to be performed. This includes the reflective measurement model analysis, formative measurement model analysis (if any) and structural model analysis.

### 3.10.1 Reflective & Measurement Model

The evaluation of a reflective measurement model (for Creditworthiness) involves 1) internal consistency (assessment using composite reliability), 2) indicator reliability (outer loadings), 3) convergent validity (AVE), and 4) discriminant validity (Fornell-Larcker & cross loadings). The evaluation is different for formative measurement models. The structural model estimates are not examined until the reliability and the validity of the construct have been established (Hair et al., 2013). If assessment of the reflective and formative measurement models provide evidence of the measure's quality, the structural model estimates are then evaluated. Hence, the primary evaluation criteria for PLS-SEM results are the coefficient of determination ( $R^2$  value) as well as the level of significance of path coefficient.

#### 3.10.1.1 Internal Consistency

The traditional criterion for internal consistency or the average correlation of items in a survey instrument is Cronbach's alpha, which is used to gauge its dependability (Santos, 1999). However, Cronbach's alpha undertakes that all indicators are equally reliable (all the indicators have equal outer loadings on the construct) while PLS-SEM selects the indicators according to their separate reliability. Cronbach's alpha is also sensitive to the number of items and generally underestimates the internal consistency reliability. Due to the limitations of Cronbach's alpha, composite reliability (also known as Dhillon-Goldstein Rho) is more appropriate to be used for PLS-SEM as it takes into account the different outer loadings of the indicator variables. This measure provides a value which ranges between 0 and 1. Composite Reliability of 0.7 and above indicates sufficient convergence or internal consistency (Gefen, Straub, & Boudreau, 2000).

### 3.10.1.2 Indicator Reliability

Indicator reliability check was also carried out. Indicator reliability refers to the outer loading which indicates the proportion of indicator variance that is explained by the latent variable. It ranges between 0 and 1. Reflective indicators with loadings that are less than 0.4 need to be removed (Hulland, 1999, p. 198). Indicators with outer loading between 0.4 and 0.7 is suggested for removal only when the deletion leads to a rise in the composite reliability and Average Variance Extracted (AVE) above the suggested threshold. The AVE criterion is described as the grand mean value of the squared loadings of the indicators related with the construct. Therefore, the AVE is equal to the communality of a construct. The removal of an indicator needs to be done carefully since the elimination may improve the reliability and discriminant validity but it may decrease the measurement's content validity.

### 3.10.1.3 Convergent Validity

For the Convergent Validity check, AVE was used. Convergent validity measures the extent to which a measure correlates positively with alternative measures of the same construct. The items that are indicators (measures) of a specific construct should converge or share a high proportion of variance. AVE value ranges between 0 and 1. Bagozzi & Yi (1988) and Fornell & Larcker (1981) suggest that variables with AVE exceeding 0.5 have adequate Convergent Validity.

### 3.10.1.4 Discriminant Validity

Discriminant validity calculates the diversity of the constructs. A high discriminating validity is preferred as it indicates that a concept is specific and that some effects are ignored by other measures. To assess discriminant validity, latent construct's correlations matrices were used where the square roots of the AVEs along the diagonals are presented. Correlational statistics among constructs are presented in



the lower left off-diagonal elements in the matrix. Discriminant validity is realized when the diagonal elements exceed the off-diagonal elements in the same row and column (Fornell & Larcker, 1981).

### **3.10.2 Formative Measurement Model**

For the formative measurement model (Access to finance), it is important to check for the collinearity among indicators as well as the significance and relevance of outer weights. There are differences when measuring formative and reflective model. For formative measurement model, collinearity issues, significance and relevance of formative indicators are being checked.

#### **3.10.2.1 Collinearity Issues**

Collinearity (also called Multicollinearity, MC) was also checked. This refers to the high correlations among indicators which can amplify the standard errors and thus reduces the ability to determine that the estimated weights significantly diverged from zero. The collinearity issues are problematic in PLS-SEM analysis since it depends on lesser sample sizes where standard errors are slightly higher due to sampling error. Additionally, high collinearity can result in the weights being wrongly projected as well as their signs being reversed (Hair et al., 2013).

#### **3.10.2.2 Significance and Relevance of Formative Indicators**

PLS-SEM relies on a nonparametric bootstrap procedure to test coefficients for their significance (Hair et al., 2006). In bootstrapping, large subsamples are taken from the original sample with replacement, i.e. every time an observation is randomly selected from the population, it is replaced back into the population before the next observation is selected. Therefore, the observation is always drawn from a population

that always comprises all the same elements. A high number of bootstrap sample is preferred, with the minimum number of bootstrap sample being at least equal to the number of valid observations in the dataset.

### 3.10.3 Structural Model

The key principles for measuring the structural model of PLS-SEM are: 1) the significance of path coefficients, 2) the level of  $R^2$  (coefficient of determination) values, 3) the  $f^2$  effect size, 4) the  $Q^2$  predictive relevance and 5) the  $q^2$  effect size. However, first, the structural model needs to be assessed for collinearity issues (aside from the formative measurement model). It is suggested to either eliminate the construct with collinearity issues, merge predictors into a single construct or create higher order constructs in order to treat the collinearity problems (Hair et al., 2013).

#### 3.10.3.1 Path Coefficient

The Path coefficient represents the hypothesized relationships among the constructs. The values range from -1 to +1 and are obtained after running the PLS-SEM algorithm. A value near  $|1|$  indicates strong relationship while a value close to zero indicates a nonsignificant relationship. The value also indicates the direction of the relationship (positive or negative). However, to determine whether a coefficient is significant, it depends on the standard error obtained from bootstrapping.

#### 3.10.3.2 R Square (Coefficient of Determination)

The most commonly used measure to evaluate the structural model is the coefficient of determination (R square). It measures the model's predictive accuracy and is measured as the squared correlation between a specific dependent construct and its predicted value. R square value ranges from 0 to 1 where higher levels indicate

greater predictive accuracy. An R square value of 0.20 is considered high in disciplines such as consumer behaviour while in marketing, 0.75, 0.50 and 0.25, as a rough rule of thumb, are described as substantial, moderate or weak, respectively (Hair, Ringle & Sarstedt, 2011; Henseler, Ringle, & Sinkovics, 2009).

### 3.10.3.3 F Squared Effect Size

The  $f^2$  effect size refers to the changes in  $R^2$  value when a specified independent construct is omitted from the model. The guidelines for measuring  $f^2$  are that values of 0.02, 0.25 and 0.35 are small, medium and large effect (Cohen, 1988), respectively, of the exogenous latent variables.

### 3.10.3.4 Q<sup>2</sup> Predictive Relevance & q<sup>2</sup> Effect Size

In addition to evaluating  $R^2$  values, the Stone-Geisser's  $Q^2$  value (Geisser, 1974; Stone, 1974) should also be analysed. This is one of the procedures in the structural model assessment. It predicts the data points of indicators in the reflective measurement models of the endogenous constructs (Hair et al., 2013). However, since the model had a formative endogenous construct, this procedure did not apply.

### 3.10.3.5 Model Fit

The model fit is the indices that determine the fit of the model. It is important to use a few indices to assess the model fitness because unlike CB-SEM, PLS-SEM does not optimize a unique global scalar function. The lack of global scalar function and the consequent lack of global goodness-of-fit measures are traditionally considered major drawbacks of PLS-SEM. The Standardized Root Mean Square Residual (SRMR) is currently the only approximate model fit criterion implemented for PLS path modelling (Henseler, Hubona, & Ray, 2016). The Normed Fit Index

(NFI) is another useful approximate model fit criterion. However, NFI does not penalise for adding parameters; thus, it should be used with caution for model comparison. NFI's usage is also still rare.

Root Mean Square error correlation (RMSttheta) is another approximate model fit criterion. Henseler et al. (2014) provide evidence that RMSttheta can distinguish well-specified from ill-specified models. However, threshold for RMSttheta is yet to be determined.

The measurement model is the top-most concern since the questionnaire was adapted and gathered from many sources while some were designed based on their definitions. Moreover, analysis on the moderating effect of firms with linkage and non-linkage was also conducted. Thus, this model was only useful (up until now) to finalise the items to be used when comparing firms with and without linkage via latent variable scores computed using the items remaining.

It must be noted that fit indices can be used as a guideline; however, it should be observed carefully. It is important not to move away from the original, theory testing purpose of structural equation modelling. There has been a lot of arguments regarding the 'rules of thumb' of the fit indices. It is highly controversial, with some experts urging for a complete abandonment of fit indices altogether (Barrett, 2007, Hair et al, 2013). Others are less certain of abandoning it and agree that adhering to the cut off values can lead to Type I error (Marsh, Hau, & Wen, 2004).

Based on the discussions on the PLS measurement analysis above, the next chapter discusses the results of this study. Nevertheless first, the preparation of data had to be performed including the descriptive statistics. This was performed to avoid any arising issues afterward.

### 3.11 Summary of the Chapter

In this chapter, the methodology involved in carrying out this study has been discussed and presented in detail. The chapter began by presenting the hypotheses for the study which were developed based on previous literature. The research design employed in this study was then discussed in detail and a summary of the research design was included in Table 3.1. Sample size and its statistical power have also been discussed. Discussion on the measurement items and scales was presented and then summarised in Tables 3.2 and 3.3, respectively. The pre-test and pilot study have also been discussed and elaborated upon. The chapter then discussed and justified the response rate of 34.6% as sufficient. The study also elaborated on the reasons for using SmartPLS and discussed the analysis involved as well as its cut off values.

## CHAPTER 4

### DATA ANALYSIS & RESULTS

This chapter begins with data preparation which involves detection of missing values, outliers, normality and multicollinearity as well as treatment for any of the issues arising from the said problems. Next, in the descriptive statistics section, the demographic profile of the sample data is described. The section on Exploratory Factor Analysis (EFA) then explains the procedures of EFA, the requirements as well as the results. Finally, Partial Least Squares analysis which was performed using SmartPLS is explained in the PLS-SEM section with results for the various models.

#### 4.1 Preparation of Data

After collecting a total of 158 responses, 13 were dropped due to unfulfilled requirements such as not within the SME classification, missing values, outliers and unreliable data, hence resulting in a final sample size of 145. Data cleaning and data preparation were also performed in accordance to the guidelines by Pallant (2007). This included checks on the scores within the range. The scores beyond the range might be due to missing values; thus, double checking was carried out and the missing values were replaced and corrected.

Apart from that, preliminary steps were also taken before hypothesis testing. Data collected was checked for extreme values or outliers, normality, multicollinearity, reliability and consistency.

#### 4.1.1 Missing Values

Due to the small sample size, the researcher attempted to minimise cases of missing values. Calls were made to redirect the questionnaire back to the respondents in order to complete the missing data. However, it was not possible to contact all respondents who had submitted incomplete responses because of the unavailability of information on the firms and the respondents. As some respondents wanted anonymity, they were not willing to reveal their personal and company information. Therefore, cases of missing information for these respondents meant that the researcher was unable to correspond with the relevant person to complete the information. Questions with Likert-scale measurements which had missing values were retained and recorded as missing value. The median replacement method was used for questions measured using the ordinal scale as suggested by Pallant (2007). This was performed to avoid the deletion of data due to the small sample size. Additionally, there were some cases with missing information on the demographic part. Thus, nine cases with missing demographic information were deleted, resulting in a sample size of 149.

Three more data were deleted due to unreliable responses, where ALL the values for questions using Likert-scale measurements were ticked as “3” or “NEUTRAL”. This represents the unwillingness and disinterest of the respondents to participate seriously in the survey (but they were told to get it completed by their higher-level officers). The deletion of these cases was to ensure that their responses did not affect the findings. After the deletion of these cases, the data consisted of 146 samples.

#### 4.1.2 Outliers

The presence of extreme values (also known as outliers) may affect the arithmetic mean (Kline, 2005) as outliers can distort the interpretation of mean. According to Tabachnick & Fidell (2007), the presence of outliers may be due to a few reasons, such as human error in data entry, misspecification of missing value code, or

perhaps the sample set may not be part of the population. The detection and elimination of outliers is very important as it can improve multivariate normality (Kline, 2005).

The continuous variables were all designed in standardized Likert scales between 1 and 5 and no reverse coded questions were required since the questionnaire was arranged to follow the outcomes from previous literature. Thus, the data did not consist of univariate outliers. Using simple “Conditional Formatting” Function in Excel, outliers which were due to human error during data entering were detected. The errors were corrected and no univariate outliers were removed from the data set.

Apart from that, an examination of the  $z$ -scores revealed three respondents that can be classified as univariate outliers with  $z$ -scores in excess of  $\pm 3.29$  (Hair et al., 2013). Two respondents were identified in the  $z$ -score of one of the items of Capital (capital4) and another was identified in the  $z$ -score of one of the items of Capacity (capacity7). However, according to the guideline by Hair et al. (2013), the  $\pm 3.29$  cut off is considered an outlier for small sample sizes, i.e. sample sizes less than 80. Thus, deleting the three cases would seem to be weakly justified. Moreover, as the boxplot checks were run, two cases were identified as outliers and one as an extreme outlier. Pallant (2007) in his guideline advised for the removal of only the extreme outliers. Thus, the one case with extreme outliers was deleted and the rest were kept in the final dataset to be used in subsequent analyses.

In total, 13 cases were deleted. The final dataset then consisted of 145 samples. Table 4.1 summarises the cases deleted.



**Table 4.1:** Case deletion

Case	Justifications
3	Not reliable
5	Outliers
7	Not reliable
20	Missing values & not reliable
28	Not reliable
30	Missing values
31	Missing values
32	Missing values
49	Missing values
52	Missing values
56	Missing values
57	Missing values
62	Missing values

#### 4.1.3 Normality

Normally distributed data is described as having a symmetrical bell shaped curve, where the greatest frequency of scores are in the middle (Gravetter & Wallnau, 2016). Normality is tested only on the dependent variables. However, PLS-SEM does not require data to be normally distributed (Hair et al, 2013). This is one of the many advantages of using PLS as discussed previously.

#### 4.1.4 Multicollinearity (MC)

A high correlation between two or more predictor variables in a multiple regression model is a phenomenon known as multicollinearity. Since a high level of multicollinearity causes confusion and misleading results (Tabachnick & Fidell, 2012), it was assessed here using the Variance Inflation Factor (VIF) as recommended by (Tabachnick & Fidell, 2007). All variables in this study have VIF values below 3.3, the accepted criterion put forth by Diamantopoulos & Sigauw (2006). Hair et al. (2013) on the other hand, suggested a threshold of 5.0.

Alternatively, inspecting the correlation matrix for independent variables is the simplest and most obvious method to find multicollinearity. The presence of high correlations of 0.90 or above suggests a substantial MC (Hair et al, 2006; Tabachnick, Fidell & Osterlind, 2001). The result shows that all the items have correlation values below 0.9; thus, it was concluded that there is no multicollinearity in the data.

## 4.2 Descriptive Statistics

The 145 responses used in this study is comprised of reliable and complete data without missing values, and outliers. Table 4.2 shows the frequency and percentage break down of each demographic variable. The variables for the demographic profile or SME characteristics are the firm's legal status, its age, its size, its character, highest educational level of the firm's financial personnel, its linkage status and its loan application status. Table 4.2 presents the frequency and percentage of firms in the different sub-industries under the manufacturing industry.

Table 4.2: Demographic profile

<u>Legal</u>	<u>Freq</u>	<u>%</u>	<u>Firm character</u>	<u>Freq</u>	<u>%</u>
Sole proprietor	29	20.00	Subsidiary company	35	24.10
Partnership	13	9.00	Branch company	5	3.40
Private limited	103	71.00	Independent	105	72.40
<u>Firm age</u>	<u>Freq</u>	<u>%</u>	<u>Education level</u>	<u>Freq</u>	<u>%</u>
Less than 2.5 years	3	2.10	Professional degree	46	31.70
Between 2.5 to 5 years	6	4.10	Master's or doctorate	17	11.70
Between 5 to 10 years	9	6.20	Bachelor	53	36.60
More than 10 years	127	87.60	Diploma	26	17.90
			SPM	3	2.10
<u>SME</u>	<u>Freq</u>	<u>%</u>	<u>Linkage</u>	<u>Freq</u>	<u>%</u>
Micro	13	9.00	With linkage	88	60.70
Small	66	45.50	Without linkage	57	39.30
Medium	66	45.50			
			<u>Loan application</u>	<u>Freq</u>	<u>%</u>
			Applied & approved	72	49.70
			Applied & rejected	4	2.80
			Not apply	69	47.60
<u>Industry</u>	<u>Freq</u>	<u>%</u>			
Food products and beverages	23	15.9			
Textiles	6	4.1			
Wearing apparel; dressing and dying of fur	3	2.1			

Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness & footwear	1	0.7
Wood and of product of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	1	0.7
Paper and paper products	7	4.8
Publishing, printing and reproduction of recorded media	7	4.8
Coke, refined petroleum products and nuclear fuel	1	0.7
Chemicals and chemical products	7	4.8
Rubber and plastic products	22	15.2
Other non-metallic mineral products	3	2.1
Basic metal	4	2.8
Fabricated metal products, excluding machinery and equipment	19	13.1
Machinery and equipment N.E.C.	11	7.6
Electrical machinery and apparatus N.E.C.	11	7.6
Radio, television and communication equipment and apparatus	5	3.4
Medical, precision and optical instruments, watches and clocks	2	1.4
Motor vehicles, trailers and semi-trailers	5	3.4
Manufacture of furniture, manufacturing N.E.C.	7	4.8

The respondents were mostly from private limited companies (71%) which are small enterprises (45.5%), more than 10 years old (87.6%) and are profit oriented enterprises, making independent decisions (72.4%). The respondents of this study were mostly the financial officers of the SMEs, with many of these financial officers having a Bachelor's degree as their highest educational qualification (36.6%). Most of the respondents were SMEs with some links to large firms (60.7%). Out of the total number of SMEs, 52.5% had applied for bank loans and their application was approved while 47.6% did not apply for any loan. Most of the respondents were also from the food products and beverages sector (15.9%), rubber and plastic products sector

(15.2%), and fabricated metal products, including machinery and equipment sector (13.1%).

### 4.3 Exploratory Factor Analysis (EFA)

Factor analysis is conducted for the purpose of reducing a big set of variables or to scale items down to a slightly smaller, more manageable number of dimensions or factors. It does this by carefully “clumping” the items which are related to each other. This technique is used when developing scales and measurement.

There were 30 items in the questionnaire for the construct ‘Creditworthiness’ as a whole since Creditworthiness was measured using the five (5) dimensions of Capacity, Capital, Character, Collateral and Condition. Eight (8) items were used to measure the construct ‘Access to Finance’. There is a minimum sample requirement for factor analysis. As suggested by Tabachnick & Fidell (1996), based on the 5:1 ratio (5 cases for each item), the minimum sample size required for factor analysis for this study is 150 (30 (items) x5 (ratio)). Since the sample size after case deletion was 145, thus the sample was considered adequate to run factor analysis.

Principal component analysis (PCA) was used as the factor extraction method. This is because PCA is a psychometrically sound procedure and it is conceptually less complex than factor analysis. In addition to that, it bears numerous similarities to discriminant analysis (Field, 2000). Factor extraction was used to identify the minimum number of factors that can be used to best characterise the inter-relation among the set of variables. PCA is the most commonly used approach (Pallant, 2002). As for the factor rotation, there are two types of approaches, orthogonal rotation or oblique rotation. Orthogonal rotation requires the researcher to assume that the underlying variables are independent (not correlated) while oblique rotation allows the factors to be correlated. In this study, the oblique rotation was used when running items for Creditworthiness since some of the questions in the questionnaire were developed based on the definition and keywords gathered from different sources and the

understanding of these 5C's were contradictory based on the different sources; thus, there were possibilities that these questions may be correlated with other constructs within the five dimensions of Creditworthiness. Promax technique was used for the oblique rotation.

Out of the 30 items in Creditworthiness, PCA revealed the presence of 5 components with eigenvalues exceeding 1, explaining 20.4%, 14.0%, 11.5%, 7.4%, and 6.2% of variance, respectively. The 5 components and 22 items were retained after collateral9, condition12, condition14, character2, character3, character8, capital2, and capital7 were dropped due to factors with less than 3 items, factor loadings less than 0.40 and cross loading with discrepancy less than 0.3 between the primary and secondary factor. The use of Lisrel on the other hand specifies that cross loading is not allowed, which is more stringent compared to SPSS.

Out of the eight items in Access to Finance, PCA revealed the presence of one component with eigenvalue exceeding 1, explaining 54.9% of variance respectively, and all items had factor loading of more than 0.40. All items in Access to Finance were thus retained.

The strength of the inter-correlation in the correlation matrix was also checked using the SPSS software. Most of them were more than 0.3 as recommended by Tabachnick & Fidell (1996). Two other statistical tools were used to help assess the factorability of the data: Bartlett's t-test of sphericity (Bartlett, 1954) and the Kaiser-Meyer-Okin (KMO) measure of sampling adequacy (Kaiser, 1970). The results of these two tests are reported in Table 4.3. The results in the table show that all the values of Bartlett's test are significant ( $p\text{-value} < 0.05$ ) and KMO results are more than 0.6 (Tabachnick & Fidell, 1996) for all the variables.

**Table 4.3:** KMO & Bartlett's test

Construct	No. of items	KMO	Bartlett's
Capacity	6	0.852	0
Capital	4	0.747	0
Character	4	0.745	0
Collateral	5	0.797	0
Condition	3	0.669	0
Creditworthiness	22	0.776	0
Access to finance	8	0.897	0

Therefore, based on the factor analysis, after having dropped some of the items, a total of 22 items remained to measure 'Creditworthiness'. In contrast, all the 8 items were retained for 'Access to Finance'. The final items for 'Access to Finance' and 'Creditworthiness' are presented in Table 4.4.

**Table 4.4:** Items remaining after EFA

Construct	Items remained
Access to finance	access1, access2, access3, access4, access5, access6, access7, access8
<b>Creditworthiness</b>	
Construct	Items remained
Capacity	capacity1, capacity2, capacity3, capacity4, capacity5, capacity6
Capital	capital1, capital3, capital4, capital5
Character	character4, character6, character7, character10
Collateral	collateral1, collateral2, collateral3, collateral4, collateral11
Condition	condition3, condition4, condition5

#### 4.3.1 Preliminary Statistics

Before moving further to analyse the relationships using PLS-SEM, some preliminary analyses on the variables were carried out to have a feel of the data. Table 4.5 provides the descriptive statistics for the main variables: Access, Creditworthiness,

Capacity, Capital, Character, Collateral and Condition. The average values were calculated for each variable using the items finalised in the EFA analysis earlier. The mean, minimum, maximum, standard deviation, skewness and kurtosis values were calculated and these are presented in Panel A of Table 4.5. In addition, the mean values of the variables are provided for each type of SME – micro, small and medium. Next, a non-parametric means comparison test (Kruskal-Wallis test) was carried out, the results of which are provided in Panel B in the same table. The non-parametric means comparison test was carried out to compare between small and medium SMEs only as they make up the majority of the SMEs in this study. Finally, the mean values of the variables for SMEs with and without linkage to large firms were calculated, and a non-parametric means comparison test (Mann-Whitney U test) was carried out, the results of which are provided in Panel C in the same table below.

Panel A shows the mean and standard deviation for Access to Finance (mean = 3.3524, sd = 0.6266), Creditworthiness (mean = 3.5805, sd = 0.3585), Capacity (mean = 3.7847, sd = 0.5448), Capital (mean = 3.419, sd = 0.6066), Character (mean = 3.7638, sd = 0.6235), Collateral (mean=3.2966, sd=0.6754), and Condition (mean = 3.6367, sd = 0.6804).

Panel B on the other hand shows the mean for each variable according to the SME's size. The Kruskal-Wallis test shows that there is a significant difference in the mean of Access to Finance ( $p = 0.011$ ) and Capacity ( $p = 0.014$ ) between the SMEs of different size. Collateral was found to be significant but only at the 10% level ( $p = 0.089$ ). Further analysis shows that there is significant difference in the mean of Access to Finance ( $p = 0.003$ ), Capacity ( $p = 0.004$ ) and Collateral ( $p = 0.045$ ) between Small and Medium enterprises. Medium-sized SMEs were found to have the highest level of access to finance (mean = 3.5117) while small-sized SMEs have the lowest level of access (mean = 3.177). This could be because most medium sized SMEs are private-limited firms compared to micro and small firms which are sole proprietorships. In terms of capacity, small SMEs were found to have the highest level of capacity (mean = 3.9212). Medium-sized SMEs have significantly higher levels of collateral compared to small-sized SMEs (mean = 3.3758). This is expected since



medium-sized SMEs have better access to finance compared to small-sized SMEs and are therefore able to acquire assets that can be put up as collateral.

Panel C shows the mean for each variable between SMEs with linkage and those without. The Mann-Whitney U test shows that there is significant difference in the mean of Creditworthiness ( $p = 0.027$ ), Capacity ( $p = 0.005$ ), Capital ( $p = 0.019$ ), and Condition ( $p = 0.029$ ) between SMEs with linkage and without linkage. Access to Finance, character and collateral were found not to be significantly different between SMEs with linkage and those without. SMEs with linkages were found to have significantly higher Creditworthiness (mean = 3.5924), Capacity (mean = 3.6562), Capital (mean = 3.5114) and Condition (mean = 3.5858). The significantly higher values for the creditworthiness dimensions and access to finance means that the SMEs gained from the linkage (as explained by the relational theory of resource-based view), that the linkages the SMEs have with the large firms improved its business condition and helped the firm build up its assets, thus enabling the SME to have better access to finance by reducing asymmetric information and via group lending. It can be argued that in order for an SME to be chosen to link with large firm (as suppliers), the SME has to work hard to improve itself and their creditworthiness in order to prove itself worthy of the alliances with the large firms (Van Gils & Zwart, 2004).

**Table 4.5: Preliminary Analysis Results**

Panel A: Descriptive Statistics								
	N	Access	Creditworthiness	Capacity	Capital	Character	Collateral	Condition
Mean	145	3.3524	3.5805	3.7847	3.419	3.7638	3.2966	3.6367
Minimum	145	1.75	2.86	2.5	1.75	2	1.4	1.67
Maximum	145	4.75	4.41	5	4.5	5	4.6	5
Std Dev.	145	0.6266	0.3585	0.5448	0.6066	0.6235	0.6754	0.6804
Skewness	145	-0.372	-0.044	-0.175	-0.463	-0.175	-0.536	-0.199
Kurtosis	145	-0.323	-0.646	-0.208	0.152	-0.023	-0.247	-0.024
Panel B: Comparison of mean between micro, small and medium enterprises								
Micro	13	3.4346	3.5338	3.7438	3.4231	3.6154	3.4	3.4877
Small	66	3.177	3.5777	3.9212	3.3258	3.7273	3.197	3.717
Medium	66	3.5117	3.5924	3.6562	3.5114	3.8295	3.3758	3.5858
Kruskal-Wallis test (Sig)		0.011	0.937	0.014	0.407	0.419	0.089	0.362
Kruskal-Wallis test (Sig): Between Small and Medium only		0.003	0.915	0.004	0.2	0.319	0.045	0.234
Panel C: Comparison of mean between SMEs with and without linkages								
With Linkage	88	3.5117	3.5924	3.6562	3.5114	3.8295	3.3758	3.5858
Without Linkage	57	3.3807	3.4993	3.6281	3.3026	3.7544	3.3053	3.5025
Mann-Whitney U test (Sig)		0.787	0.027	0.005	0.019	0.917	0.937	0.029

### 4.3.2 Common Method Variance Biasness

Data collected may be subject to common method variance biasness when a self-reported questionnaire is used to measure all the variables in a study. Conway & Lance (2010, p. 328) pointed out that “common method bias inflates relationships between variables measured by self-reports”. According to Podsakoff & Todor (1985, p. 65), “invariably, when self-report measures obtained from the same sample are utilised in research, concern over same-source bias or general method variance arises”. Campbell (1982, p. 692) further elaborates that “If there is no evident construct validity for the questionnaire measure or no variables that are measured independently of the questionnaire, I am biased against the study and believe that it contributes very little and many people share this bias”. In view of this, the Harman one-factor test was performed to identify the extent of this biasness (Ramayah, Lee, & In, 2011). According to Podsakoff & Organ (1986), common method bias is a concern if a single latent factor could describe the majority of the explained variance. In this study, the unrotated factor analysis showed that the factor accounted for most of the variance in the endogenous variable was 20.44%; thus, the common method bias was not a serious threat. In comparison, Doty & Glick (1998) in their study found common method variance of 26% a bias, yet reiterated that it does not invalidate many research findings.

### 4.4 PLS-SEM

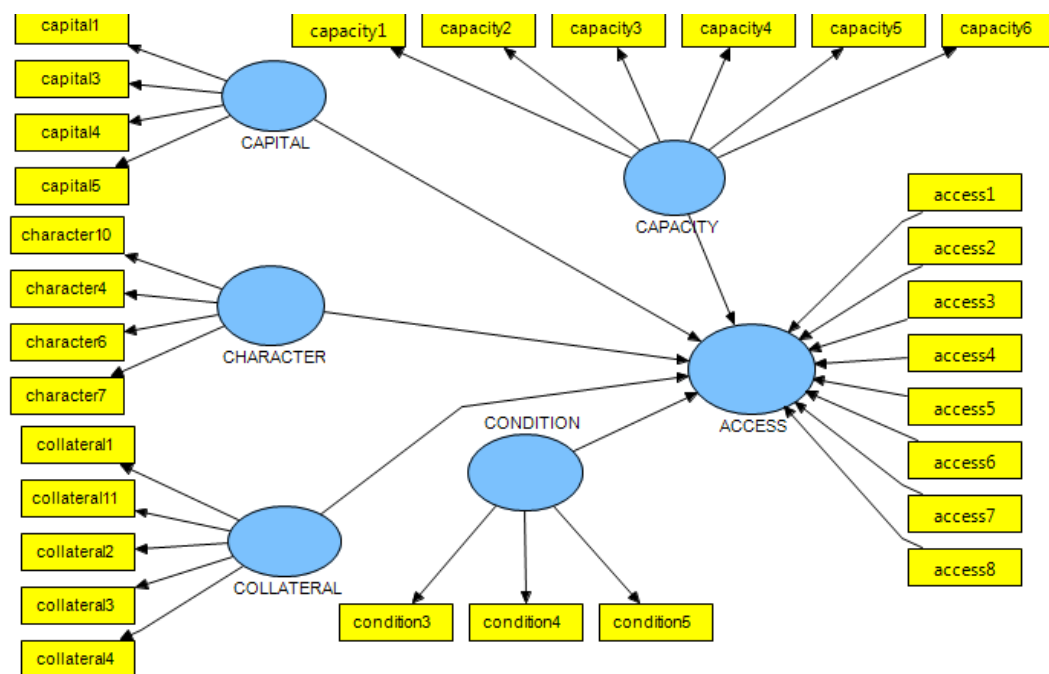
For the analysis using PLS-SEM, the study was divided into four models for easy reference. In the first model (Model 1), confirmatory factor analysis using PLS was used to finalise the items to remain and these items are to be used for Model 2. The first model provided answers to hypotheses H2a to H2e which were to test the direct relationship of the 5C's of creditworthiness on access to finance.

The second model (Model 2) was used to answer Hypothesis 1 which was to test the direct relationship between Creditworthiness and Access to Finance. The items that remained in the first model were used to form the latent variable scores (each of

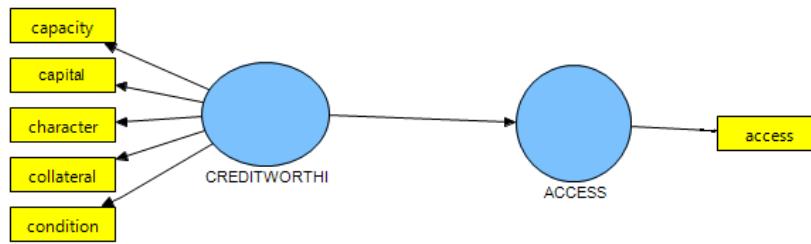
the 5C's) for Creditworthiness as well as the latent variable score for Access to Finance. Model 2 was a second order model using a two-stage approach.

Models 1 and 2 were re-run using multi-group analysis (PLS-MGA) to test the moderating effect of inter-firm linkages on the relationships found in Models 1 and 2, i.e. to test Hypothesis 3. Since the moderating variable was categorical, the data was split into two to test for differences in the models for firms with linkages and firms without any linkage. Hence, Models 1 and 2 were retested using data of firms with linkage to large firms and without linkage to any large firm, respectively. Figure 4.1 illustrates the models with items before deletion in SmartPLS.

**MODEL 1**



## MODEL 2



\*using latent variable scores

**Figure 4.1:** Illustration of model

### 4.4.1 Justification of Indicators

The use of PLS model requires the test of both the measurement model as well as the structural model. In this study, Creditworthiness was treated as a reflective measurement model while Access to finance was treated as a formative measurement model. This is because Creditworthiness is reflected by the firm's capacity in getting finance, its capital, borrowing character, collateral and condition (the 5C's). In other words, the 5C's are the factors that the financial providers would consider when deciding whether to grant loans or otherwise. The 5C's did not form the Creditworthiness context as there could be other factors that can be important to the Creditworthiness "context" but were not used in calculating Creditworthiness in this study. This is because studies related to Creditworthiness are relatively small and in the exploratory form. This is the reason why exploratory factor analysis (EFA) was first carried out in this study; it was performed to a gain better understanding of the factors of Creditworthiness. This implies that Creditworthiness is subjected to changes and there could be more unexplored factors in Creditworthiness. It should be noted that there is a minimum sample requirement when running PLS-SEM and the samples in this study were limited (only 57 responses for firms without linkage to large firms). Using the 10 times ratio rule, the study was able to only have a maximum of six factors/predictors. Since there are 5 factors (5C's), at least 50 responses were required for each group (with and without linkage); thus, the 57 responses for the group

“without linkage” and 88 responses for the group “with linkage” were considered sufficient to run the PLS-SEM analysis.

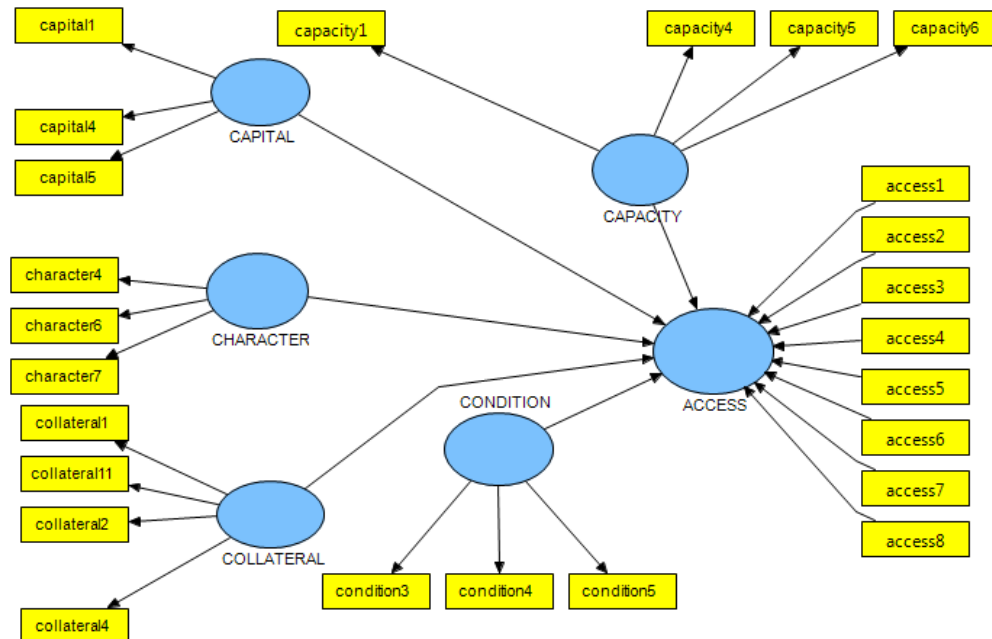
Another reason why Creditworthiness should be treated as a reflective measurement model is because the 5C’s may correlate with each other instead of being independent since they do not stand on their own to form the Creditworthiness “context”. For example, theoretically, the capital of the firm may be highly related to its collateral. A firm with large amounts of capital may use the capital to buy assets such as machinery or buildings, which will serve as the firm’s collateral when applying for loan. Thus, high capital may translate into high collateral.

Access to Finance was treated as a formative measurement model since the accessibility, availability, cost, product range, loan size, quality, repeated access, and tailored product or services formed the definition of Access to Finance. These indicators are independent and stand on their own (i.e. are not highly correlated). Each of these indicators is valuable and they define different aspects of Access to Finance and must not simply be removed unless the remaining indicators (after deletion) still sufficiently capture the construct’s content from the theoretical perspective.

Apart from that, the items used to measure Capacity, Capital, Character, Collateral and Condition were adapted based on previous literature (Harif, Hoe & Zali, 2011; Berger & Schaeck, 2011; Love & Mylenko, 2003; Harvey, Macht & Sharma, 2012; Bartoli et al., 2013; European Central Bank Survey, 2014; Claessens & Tzioumis, 2006; Haron & Shanmugam, 1994; Rose, 2002) and not based on the definition of each 5C’s construct as compared to the items chosen to measure Access to Finance.

#### 4.4.2 Model 1: First Order

Based on Figure 4.1, some items were then deleted until the outer loading was more than 0.40. Figure 4.2 presents the result of Model 1 with the finalised items for each construct. This was gathered from SmartPLS. The figure shows the items remaining in the model.



**Figure 4.2:** Result of Model 1

The evaluation of a reflective measurement model (for Creditworthiness) involves 1) internal consistency (assessment using composite reliability), 2) indicator reliability (outer loadings), 3) convergent validity (AVE), and 4) discriminant validity (Fornell-Larcker & cross loadings).

All the components were satisfactorily reliable, ranging from 0.747 to 0.868 which were above the cut-off point of 0.7 (Gefen, Straub, & Boudreau, 2000). The results in Model 1 also show that outer loadings ranged between 0.433 to |0.977| which were more than 0.4 after the deletion of capacity3 and capital3 (capacity3 and capital3 were removed due to loadings of less than 0.4 threshold). The result in Table 4.8 shows AVE values ranging between 0.513 and 0.571 for all variables which is

more than the 0.50 threshold (Bagozzi & Yi, 1988; Fornell & Larcker, 1981), indicating an adequate convergent validity. As for discriminant validity, the results of Fornell-Larcker Criterion Analysis are reported in Table 4.6.

**Table 4.6:** Fornell-Larcker criterion

	Access	Capacity	Capital	Character	Collateral	Condition
Access	-					
Capacity	0.125	0.761				
Capital	0.181	0.242	0.71			
Character	0.443	0.281	0.005	0.804		
Collateral	0.399	0.081	0.192	0.376	0.772	
Condition	0.08	-0.19	-0.204	0.202	0.022	0.753

All the values in the diagonal elements exceed the values of the same row and column. Apart from that, the indicators' outer loadings were also checked. All indicators' outer loadings for each construct are higher than all its cross loadings with other constructs as can be seen in Table 4.7.

**Table 4.7:** Outer loading and cross loadings

	Capacity	Capital	Character	Collateral	Condition
capacity1	0.614	0.246	0.146	0.101	-0.152
capacity4	0.781	0.197	0.21	0.108	-0.11
capacity5	0.815	0.207	0.205	0.023	-0.214
capacity6	0.817	0.183	0.259	0.063	-0.137
capital1	0.109	0.777	-0.043	0.181	-0.251
capital4	0.271	0.862	0.05	0.136	-0.117
capital5	0.105	0.41	0.055	0.051	-0.167
character4	0.124	-0.138	0.772	0.204	0.284
character6	0.24	0.038	0.791	0.266	0.139
character7	0.308	0.105	0.848	0.413	0.074
collateral1	0.026	0.155	0.344	0.845	0.08
collateral11	0.124	0.029	0.206	0.537	0.107
collateral2	0.033	0.175	0.3	0.857	0.047
collateral4	0.088	0.205	0.295	0.805	-0.143
condition3	0.146	0.268	-0.053	0.092	-0.481
condition4	0.163	0.196	-0.183	-0.004	-0.979
condition5	0.23	0.206	-0.185	-0.052	-0.714



Table 4.8 summarises the measurement model of the finalised items for the construct.

**Table 4.8:** Summary of reflective measurement model

Construct	Item	Outer loading	Composite reliability	AVE	Discriminant validity
Capacity	capacity1	0.622	0.868	0.569	Yes
	capacity2	0.774			
	capacity4	0.803			
	capacity5	0.804			
Capital	capital1	0.779	0.747	0.513	Yes
	capital4	0.863			
	capital5	0.433			
Character	character4	0.753	0.831	0.555	Yes
	character6	0.782			
	character7	0.838			
	character10	0.583			
Collateral	collateral1	0.843	0.856	0.55	Yes
	collateral2	0.85			
	collateral3	0.638			
	collateral4	0.796			
Condition	collateral11	0.525	0.788	0.571	Yes
	condition3	-0.487			
	condition4	-0.977			
	condition5	-0.723			

For the formative measurement model, it is important to check for the collinearity among indicators as well as the significance and relevance of outer weights. Collinearity (also called Multicollinearity, MC) was also checked. This refers to the high correlations among indicators which can amplify the standard errors and thus reduce the ability to determine that the estimated weights significantly diverged from zero. The collinearity issue is problematic in PLS-SEM analysis since it depends on smaller sample sizes where standard errors are slightly higher due to sampling error. Additionally, high collinearity can result in the weights being wrongly projected as well as their signs being reversed (Hair et al., 2013).

The results in Table 4.9 show no collinearity issue as the VIF values are all below 5.0 (Hair, Ringle, & Sarstedt, 2011). VIF is the measurement tool used to assess the collinearity level.

**Table 4.9:** Collinearity of Indicators

<b>CAPACITY</b>	<b>VIF</b>	<b>CAPITAL</b>	<b>VIF</b>	<b>CHARACTER</b>	<b>VIF</b>
capacity1	1.705	capital1	1.228	character4	1.315
capacity4	1.715	capital4	1.329	character6	1.603
capacity5	1.561	capital5	1.335	character7	1.533
capacity6	1.495				

<b>COLLATERAL</b>	<b>VIF</b>	<b>CONDITION</b>	<b>VIF</b>	<b>AF</b>	<b>VIF</b>
collateral1	2.079	condition3	1.395	access1	2.215
collateral11	1.154	condition4	1.703	access2	2.503
collateral2	2.022	condition5	1.519	access3	1.255
collateral4	1.693			access4	2.37
				access5	1.678
				access6	2.2
				access7	1.622
				access8	1.963

In bootstrapping, samples of 5,000 were used as recommended by Hair et al. (2006). The result shows that none of the item's outer weight is significant. Thus, the formative indicator's outer loading would have to be analysed. The result shows that the indicator's outer loadings were above 0.5 for access1 and less than 0.5 for access2, access3, access4, access5, access 6, access7 and access8. The indicators with outer loadings above 0.5 were retained while those below 0.5 may be deleted. However, it was decided that these items should be retained because of the suggestion in the literature that these indicators are important measures. The values for the outer weight and outer loading of Access to Finance are provided in Table 4.10.

**Table 4.10:** Outer weight and outer loading of Access to Finance

Items	Outer loadings	p	Outer weights	p
access1	0.828*	0.041	1.268	0.071
access2	0.288	0.183	-0.459	0.211
access3	0.025	0.927	-0.087	0.751
access4	0.462	0.082	0.375	0.337
access5	0.229	0.403	-0.111	0.74
access6	0.190	0.412	-0.422	0.325
access7	0.118	0.618	-0.163	0.625
access8	0.294	0.158	0.125	0.593

\* significant at 0.05 level

#### 4.4.2.3 STRUCTURAL MODEL

The key principles for measuring the structural model of PLS-SEM are: 1) the significance of path coefficients, 2) the level of  $R^2$  (coefficient of determination) values, 3) the  $f^2$  effect size, 4) the  $Q^2$  predictive relevance and 5) the  $q^2$  effect size.

This study assess the 5C's of creditworthiness, i.e. Capacity, Capital, Character, Collateral and Condition as predictors of Access to Finance. All VIF values were below the threshold of 5.0, indicating collinearity among the predictor constructs is not an issue in the structural model. Next, the  $R^2$  value of the endogenous latent variable, Access to Finance, was examined. The  $R^2$  value of 0.263 was rather weak.

In examining the relative importance of exogenous drivers' construct for Access to Finance, it can be seen in Table 4.11 that Character is the most important, followed by Collateral, Capital, Condition and Capacity.

Looking at the total effect, the influence of each driver's construct on Access to Finance can be evaluated. Character has the strongest total effect on Access to Finance (0.355), where it is interpreted as a large effect. This is followed by Collateral

(0.221) and Capital (0.146) as medium effect, and Capacity (-0.045) and Condition (0.036) as having a small effect, respectively. Therefore, it is advisable for firms to focus on building good borrowing character so as to signal their good borrowing image to the financial providers. By taking into consideration the construct's indicator loadings, it was found that Character7 has the highest outer loading (0.848), implying that this specific element of Character needs to be addressed. This item relates to the survey question "Other lenders have good lending experience with us". Thus, firms should try to enhance lender's perception of their lending experience with the firm. The  $f^2$  effect sizes of the construct Capital (0.025), Collateral (0.053) and Character (0.124) were shown to have small effect size.

Using bootstrapping method with 5,000 subsamples setting, the result shows that only the relationship of Character (p-value = 0.00) and Collateral (p-value = 0.015) with Access to Finance is significant at 0.025 level, while the rest of the path coefficients are not significant. Therefore, it is advisable for firms to focus on -strengthening their borrowing character and building up their collateral. The predictive relevance,  $Q^2$  and  $q^2$  effect size assessment did not apply to Model 1 since the endogenous construct is a formative construct.

**Table 4.11:** Summary of structural model- Model 1

	Path coefficient	p	F <sup>2</sup>	R <sup>2</sup>	Q <sup>2</sup> & q <sup>2</sup>
Capacity→Access	-0.045	0.533	0.002		
Capital→Access	0.146	0.059	0.025		
Character→Access	0.355*	0	0.124	0.263	n/a
Collateral→Access	0.221*	0.015	0.053		
Condition→Access	0.036	0.651	0.002		

\* significant at 0.05 level

## MODEL FIT

The model fit is made up of the indices that determine the fit of the model. It is important to use a few indices to assess the model fitness because unlike CB-SEM, PLS-SEM does not optimize a unique global scalar function. The lack of global scalar function and the consequent lack of global goodness-of-fit measures are traditionally considered major drawbacks of PLS-SEM. The Standardized Root Mean Square Residual (SRMR) is currently the only approximate model fit criterion implemented for PLS path modelling (Henseler, Hubona, & Ash, 2016). The Normed Fit Index (NFI) is another useful approximate model fit criterion. However, NFI does not penalise for adding parameters; thus, it should be used with caution for model comparison. NFI's usage is also still rare. For reporting purpose, the model fit for the model is as shown in Table 4.12.

**Table 4.12:** Model fit for tests of model and approximate model fit

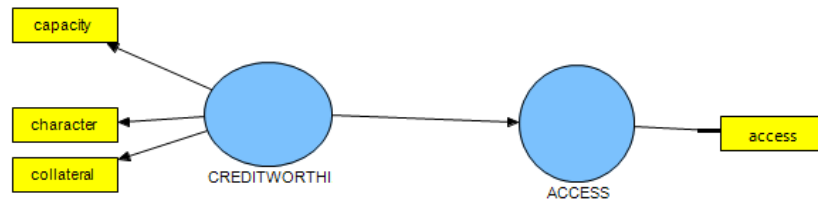
	<b>Result</b>
SRMR	0.080
NFI	0.962

Based on Table 4.12, SRMR (0.080) is below threshold of 0.10, indicating adequate model fit (Appelbaum et al, 2016; Cao, Hirschi, & Deller, 2013; Schmidt & Retelsdorf, 2016; Hair, Ringle & Sarstedt, 2011). NFI (0.962) is also sufficient as it is slightly higher than 0.9 (Kline, 2005). The measurement model is the top-most concern since the questionnaire was adapted and gathered from many sources while some were designed based on their definitions. Moreover, analysis on the moderating effect of firms with linkage and non-linkage was also conducted. Thus, this model was only useful (up until now) to finalise the items to be used when comparing firms with and without linkage via latent variable scores computed using the items remaining in Model 1. The measurement model for Model 1 was therefore the main concern.

It must be noted that fit indices can be used as a guideline. However, it should be observed carefully. It is important not to move away from the original, theory testing purpose of structural equation modelling. There has been a lot of arguments

regarding the ‘rules of thumb’ of the fit indices. It is highly controversial, with some experts urging for a complete abandonment of fit indices altogether (Barrett, 2007, Hair et al, 2013). Others are less certain to abandon it but agree that adhering to the cut off values can lead to Type I error (Marsh, Hau, & Wen, 2004).

#### 4.4.3 Model 2: Second Order



**Figure 4.3:** Result of Model 2

As the items used to measure each element of Capacity, Capital, Character, Collateral and Condition (5C’s) as well as Access to Finance had already been identified, the second model is a second order model using latent variable scores of each variable. In this two-stage approach, the latent variable scores of the 5C’s were the indicators for Creditworthiness (multi-item construct) while Access to Finance was a single item construct. Creditworthiness was treated as a reflective model. The purpose of this model is to test the relationship between Creditworthiness and Access to Finance (to answer Hypothesis 1).

#### *RESULTS OF MODEL 2*

The composite reliability values were 0.758 for Creditworthiness and 1.0 for Access to Finance. They were well above the 0.70 threshold, demonstrating high levels of internal consistency reliability. Composite reliability for Access to Finance was 1.0 because it is a single item construct. However, it is not an evidence of perfect reliability. AVE values for Creditworthiness (0.52) and Access to Finance (1.0) were above the 0.50 threshold, indicating high levels of convergent validity. The Fornell-Larcker criterion showed that the diagonal values were higher than the correlations in the rows and columns. This is evidence for construct discriminant validity. The outer loading showed that Character (0.868) had the highest value, followed by Collateral (0.718)

and Capacity (0.539). This result indicates that with regards to Creditworthiness, SMEs should focus on the aspect of character to gain better access to finance. This is consistent with the results found for the first order model for Model 1. Only three (3) indicators (Capacity, Collateral and Character) were retained out of the five (5) indicators. Capital and Condition were removed as their outer loadings were below the 0.40 threshold.

Table 4.13 provides the summary of the structural model for Model 2. For the structural model assessment of Model 2, all VIF values were below the 5.0 threshold, indicating that there is no collinearity issue.  $R^2$  value was 0.205, meaning only 20.5% of the variance in Access to Finance is explained by Creditworthiness in this model and this can be considered weak. The total effect of Creditworthiness towards Access to Finance was 0.452. Using bootstrap method with 5,000 subsample setting, the path coefficient (Creditworthiness→Access to Finance) relationship was shown to be significant ( $p$ -value=0.000) at 0.01 level. The  $f^2$  effect size was 0.257, which is large. Lastly, using blindfolding procedure (with omission distance of  $D=7$ ), the predictive relevance ( $Q^2$ ) of the path model was 0.187; however, the relative measure of predictive relevance ( $q^2$ ) was not applicable since there was only one independent variable.

**Table 4.13:** Summary of structural model- Model 2

	<b>Path coefficient</b>	<b>p</b>	<b>F<sup>2</sup></b>	<b>R<sup>2</sup></b>	<b>Q<sup>2</sup> &amp; q<sup>2</sup></b>
Creditworthiness→Access	0.452***	0.00	0.257	0.205	n/a

\*\*\* significant at 0.001 level

#### 4.4.4 Moderating Role of Inter-firm Linkages

Next, the moderating effect of linkage was tested to help understand whether firms with links to large firms are different from firms without links to any large firm. The moderator, 'Linkage' is a categorical moderator variable. Path coefficients based

on different samples are always different but there is a need to investigate how statistically significant the difference is. To test whether there are significant differences between coefficients, parametric approach to PLS-SEM multi-group analysis (PLS-MGA) was run to compare the two groups (Keil et al., 2000).

Rather than analysing the aggregate data set (run in Model 1 and Model 2) of 145 observations, Model 2 was analysed separately for both groups of “with linkage” and “without linkage”. Thus, there were a total of 88 observations for the group with linkage (n = 88) while there were 57 observations for the group without linkage (n = 57). The study tested the moderating effect of linkage between Creditworthiness and Access to Finance as a continuation of Model 2 as well as to test Hypothesis 3 and answer Research Question 3.

The result in Table 4.14 shows that there is a significant relationship between Creditworthiness and Access to Finance for SMEs with linkage as well as SMEs without linkage. When testing for the moderating effect however, the moderating effect was found to be insignificant. Table 4.14 summarises the results for both linkage group as well as the moderating effect.

**Table 4.14: PLS-MGA Result**

	Group with-linkage		Group without-linkage		With Linkage vs Without Linkage		
	p	std error	p	std error	difference	p	Levene's
Creditworthiness →Access	0.540 ***	0.081	0.526 ***	0.094	-0.014	0.911	0.715
N	88		57				

\*\*\* significant at 0.001 level



Since the moderating effect of linkage was insignificant on SME Creditworthiness and Access to Finance, further analysis was carried out to see if there is significant moderating effect of linkage towards each of the Creditworthiness elements and Access to Finance. Thus, the relationship of each of the 5C's towards Access to Finance was further investigated. It should be noted that in order to do this, 50 observations per group ( $5 * 10$ ) were needed to meet the rules of thumb for minimum sample size requirement based on the 10 times rule since the maximum number of arrows pointing at the latent variable was 5. Following a more rigorous recommendation from power analysis, 75 observations per group would be required. The sample size for group without linkage was therefore insufficient for the non-linkage group. However, since the population is small and given that these were all the responses received after approaching the population, the study proceeded even with 57 data for the non-linkage group.

Choosing the appropriate parametric test statistic should be based on whether standard errors are supposed to be equal or unequal in the population. Thus, the result of Levene's test was first examined. An insignificant result of Levene's test implies equal standard error, thus the p-value result of t-statistic under "Equal standard errors assumed" was taken into consideration and vice versa. Table 4.15 summarises the results.

**Table 4.15:** Comparison of PLS-MGA Result for groups with and without linkages

	Group with-linkage		Group without-linkage		With vs Without Linkage	
	path coeff.	std error	path coeff.	std error	diff	Levene's
Capacity→Access	-0.006	0.106	-0.168	0.131	0.162	0.479
Capital→Access	0.092	0.102	0.17	0.114	-0.078	0.192
Character→Access	0.442***	0.088	0.356**	0.135	0.086	0.960
Collateral→Access	-0.325***	0.096	0.234	0.155	0.559	0.985
Condition→Access	-0.094	0.1	0.347**	0.12	0.441**	0.384
n	88		57			

\*\* significant at 0.01 level

\*\*\* significant at 0.001 level

Results of the Levene's test showed an insignificant result for the relationship between Capacity and Access, Capital and Access, and Condition and Access; thus, the t-statistic result under "Equal standard errors assumed" was consulted for these relationships. In contrast, the Levene's test results showed significant relationships between Character and Access and Collateral and Access; thus, the t-statistic under "Unequal standard errors assumed" was consulted.

For the group with linkage to large firms, it is found that only the Character→Access (p-value=0.000) and Collateral→Access (p-value=0.001) relationships were significant at the 0.001 level while the rest of the coefficients, namely Capacity, Capital and Condition were found to be insignificant (p=0.908, 0.393 and 0.347 respectively). For the group without linkage to any large firms, significant coefficients were found for Character→Access (p-value=0.006) and Condition→Access (p-value=0.004) at 0.01 level while Capacity, Capital, and Collateral were insignificant (p=0.225, 0.156 and 0.153 respectively). After testing for moderating effect of Linkage between the two groups, the coefficients of Collateral→Access (p-value=0.003) and Condition→Access (p-value=0.005) were found to be significant at the 0.01 level.

As compared to the aggregate data set (all firms, i.e. combining both with and without Linkage with 145 responses), the predictive values were better when the sample was split into those with linkages and those without linkages. Table 4.16 shows the predictive values for the model of firm with linkage and firm without linkage.

**Table 4.16:** Comparison of structural model

<b>Firms with Linkages</b>	<b>Path coefficient</b>	<b>F<sup>2</sup></b>	<b>R<sup>2</sup></b>	<b>Q<sup>2</sup></b>	<b>q<sup>2</sup></b>	<b>f<sup>2</sup></b>
Capacity→Access	-0.006	0.014			-0.02755	0.039
Capital→Access	0.092	0.029			-0.00229	0.013
Character→Access	0.442***	0.265	0.359	0.287	0.177324	-0.168
Collateral→Access	-0.325***	0.180			0.125404	-0.116
Condition→Access	-0.094	0.029			-0.02895	0.040
<b>Firms without Linkages</b>	<b>Path coefficient</b>	<b>F<sup>2</sup></b>	<b>R<sup>2</sup></b>	<b>Q<sup>2</sup></b>	<b>q<sup>2</sup></b>	<b>f<sup>2</sup></b>
Capacity→Access	-0.168	0.063			-0.039	0.039
Capital→Access	0.170	0.064			0.019	-0.019
Character→Access	0.356**	0.138	0.391	0.366	0.091	-0.091
Collateral→Access	0.234	0.076			0.027	-0.027
Condition→Access	0.347**	0.197			0.139	-0.139

\* significant at 0.05 level

\*\* significant at 0.01 level

#### 4.5 Summary of the Chapter

This chapter explained the step-by-step approach used for carrying out data analysis in this study. It began with data preparation which involved the detection of missing values, outliers, normality and multicollinearity. Median replacement method was used for missing values for the Likert-scale questions. Cases with too many

missing information for the non-Likert-scale question were deleted as were those with unreliable responses. Data were shown to have no multicollinearity and one case of extreme outliers was deleted. Next, the chapter summarised the descriptive statistics (demographic profile of the sample). Explanatory Factor Analysis (EFA) was performed, and this was then followed by PLS-SEM analysis. In EFA, Principal Component Analysis was used as the factor extraction method with oblique rotation using Promax technique. The study also showed no serious threat of common method bias. An illustration of Model 1 and 2 which were extracted from SmartPLS can be found in Figure 4.1. The chapter ended with indicators for PLS-SEM and its justification.

## CHAPTER 5

### DISCUSSION AND CONCLUSION

This chapter presents the discussion of the results found in the previous chapter. It starts with a summary of the findings where the research questions and hypotheses set out for this study are revisited, followed by a discussion of the findings with reference to theory and previous literature. Contribution of the study, its limitations and recommendations for future studies are also discussed which is then followed by the conclusion.

#### 5.1 Summary of Findings

The main focus of this study was to examine the role of inter-firm linkage in easing an SME's access to finance via its effect on the creditworthiness of the SME. Therefore, the main objective of this study was to investigate the role played by large firms in influencing an SME's access to finance. The questions asked in this research were thus:

Research Question 1:

**Is there a relationship between an SME's creditworthiness and its access to finance?**

Research Question 2:

**How does each dimension of an SME's creditworthiness namely its capacity, capital, character, collateral and condition affect its access to finance?**

Research Question 3:

**Does inter-firm linkage (between an SME and large firms) have a moderating effect on the relationship between an SME's creditworthiness and its access to finance?**

Research Question 1 was answered through Hypothesis 1, while Hypotheses 2a to 2e were used to answer Research Question 2. Research Question 3 was answered through Hypothesis 3. Table 5.1 summarises the results of this study. The results are discussed in the following section.

**Table 5.1:** Hypotheses and results

<b>Hypothesis</b>	<b>Result</b>
H1 An SME's creditworthiness has a significant positive relationship with its access to finance.	Supported
H2a An SME's credit capacity has a significant positive relationship with its access to finance.	Not Supported
H2b An SME's capital has a significant positive relationship with its access to finance.	Not Supported
H2c An SME's character has a significant positive relationship with its access to finance.	Supported
H2d An SME's collateral has a significant positive relationship with its access to finance.	Not Supported
H2e An SME's condition has positive relationship with its access to finance.	Not Supported
H3 Inter-firm linkage between an SME and large firms moderates the relationship between an SME's creditworthiness and its access to finance.	Not Supported

## 5.2 Discussion of Findings

The findings of the study are discussed in detail in this section. The relationship between creditworthiness (including its dimensions) with access to finance is first discussed, and this is then followed with the discussion on the effect of inter-firm linkages on this relationship.

### 5.2.1 Creditworthiness, Access to Finance and Inter-firm Linkages

It was found that there is a positive relationship between creditworthiness and access to finance, i.e. the better the creditworthiness of an SME, the easier it is for the SME to get financing such that the SME has better accessibility, better terms and lower credit constraints. This finding is significant where an SME's creditworthiness is measured by its capacity, character and collateral. In other words, capacity, character and collateral are important tools to measure creditworthiness (Haron & Shanmugam, 1994). The combination implies that the SME's capability to repay the loan, its good character such as the intention and willingness to repay the loan, and its ability to provide sufficient collateral to support its loan application suggest that the firm is trustworthy and is serious in borrowing and repaying the loan (Hill & Sarangi, 2012). Thus, it can be deduced that these important elements of creditworthiness would result in better access to finance for these SMEs based on the result of this study.

Further investigation into the relationship between each 5C of creditworthiness and access to finance found that character and collateral have significant positive relationships with access to finance. Capacity however, did not have a significant relationship with access to finance when investigated individually. The relationship between capacity and access to finance was not significant possibly due to the notion that SME's are commonly associated with information asymmetry with regards to their financial situation or that they lack proper financial records (Navas-Alemán, Pietrobelli, & Kamiya, 2015; SME Corp. Malaysia, 2012). Most SMEs cannot offer hard information which is quantitative, verifiable and mostly found in financial statements thus they are considered unbankable (Navas-Alemán, Pietrobelli, & Kamiya, 2015; SME Corp. Malaysia, 2012). Another reason is because SMEs are known to lack capacity (Nyamboga et al., 2014). The third reason is that although profitable SMEs are capable of debt repayment, they may switch to finance themselves internally, using retained earnings (Demirgüç-Kunt & Maksimovic, 1998). This is supported by the Pecking Order Theory which explains that firms prefer internal finance rather than external finance due to the lower informational cost caused by asymmetric information (Frank & Goyal, 2003; Psillaki & Eleftheriou, 2015).

When running the model using only the data from SMEs with linkage, it was found that collateral has a significant negative relationship towards access to finance. However, when only data from SMEs without linkage were considered, it was found that collateral has an insignificant relationship with access to finance. This moderating effect was found to be significant using PLS-MGA analysis (refer to Table 4.15). Linkage therefore plays an important role as a moderator as it is able to change the relationship between collateral and access to finance. It shows that linkage with large firms helps SMEs to build up their assets and collateral, but end up with tighter access to finance as the house bank were reported to exploit the lock-in requirement by demanding higher collateral (Elsas & Krahn, 2000; Menkhoff, Neuberger, & Suwanaporn, 2006). In addition, linkage with large firms also helps SMEs when building assets as the large firms often become the guarantors for the SMEs which strengthen the relationship between collateral and access to finance for SME with linkage ((Navas-Alemán, Pietrobelli, & Kamiya, 2012).

SMEs are the suppliers to large firms; thus, suppliers' operating features such as cycle time compression, exact point in time delivery performance and perfect order-to-delivery become the primary preferences in supply chain. These features however, require SMEs to invest in technology, real estate and other assets (Bowersox, Closs, & Stank, 2000; Melo, Nickel, & Saldanha, 2009; Menkhoff, Neuberger, & Suwanaporn, 2006). Since a house bank is the first to lend or to develop close relationships with the borrower, they have the first opportunity to secure major assets as collateral from the borrowers and demand higher collateral when renegotiating debt contract. Borrowers thus find themselves in a locked-in situation because switching mortgages to another bank would involve extra transaction costs (Menkhoff, Neuberger, & Suwanaporn, 2006).

It was also found that there is an insignificant relationship between capital and access to finance. This result is in line with Haron & Shanmugam (1994) that capital is a less important factor that banks consider when granting loans to SMEs. This is because firms with higher capital are more likely to finance themselves internally and



only look for external finance when they have exhausted their capital. Firms in food product and beverages industry for example (which represent 13% of this study), given their specific industry and market characteristics, fund their operation out of internally generated funds and they are less frequent on credit (Padachi, Howorth, & Narasimhan, 2012).

This study found a significant positive relationship between SMEs' borrowing character and access to finance. Indeed, borrowing character is persistently shown to be significant in every way of testing the relationship. It is the most important element in Creditworthiness; it has a significant direct relationship to access to finance even when the SMEs are categorised into two different groups – those with linkages to large firms and those without. This is in line with Haron & Shanmugam (1994) and Harif, Hoe & Zali (2011) who stressed that character is the most important factor for the banks to grant lending to SMEs. The findings of this study further show that this is true regardless of whether the SMEs have linkage or otherwise. In this study, SMEs with good borrowing character, which are defined as having consistent and sufficient financial track records, good repayment history (never defaulting on a loan), good relationship with banks and business partners, earn a handsome reward by having better access to finance.

This study also found that there is an insignificant relationship between access to finance and business condition. Interestingly, after the data was filtered for SMEs without linkage, it was found that the relationship between access to finance and business condition becomes significant. This shows the effect of linkage (moderating effect) towards the relationship between the two. The moderating effect was proven to be significant using the PLS-MGA analysis (refer to Table 4.15). This implies that SMEs without linkage are highly exposed to business risk while SMEs with linkage are less affected by business condition. Among those without linkage, those with better business conditions get better access to finance due to the lower probability of default which the borrower is willing to undertake that results in external credit becoming less expensive (Cuadra, Sanchez, & Sapriza, 2010).

On the other hand, the access to finance for SMEs with linkage is not affected by its business condition. In other words, even during economic downturns, access to finance for SMEs with linkage is not affected compared to SMEs without linkage. This is because the linkage works as an assurance that the SMEs will be able to repay the financing received based on the reputation and capabilities of the business partner (large firms) to service its payments to their suppliers (Navas-Alemán, Pietrobelli, & Kamiya, 2012). Additionally, some large firms provide group lending to their suppliers while some even go as far as becoming the SME's guarantor to ease its financing with the banks (Navas-Alemán, Pietrobelli, & Kamiya, 2012).

Furthermore, when monetary condition is tightened, there is increase in interest rates and firms which are more likely to be affected are SMEs (Bougheas, Mizen, & Yalcin, 2006). As SMEs compete among each other for external finance during these times of tightened monetary condition, lenders prefer to lend to firms associated with large firms since they have lower risk, higher profitability, are able to provide higher collateral and are able to provide guarantors. Small firms are often found to have greater sensitivity in sale, and inventory (Bougheas, Mizen, & Yalcin, 2006), thus are more prone to economic crisis. Linkage with large firms helps improve the SMEs' capability to repay their debt as the large firms become the financial guarantor of these SMEs and large firms have good reputation in servicing their suppliers, thus indicating lower default risk to the banks (Navas-Alemán, Pietrobelli, & Kamiya, 2012; Hill & Sarangi, 2012). The preferences of lenders towards firms with linkage and the assurance from the reputable linkage partners helps improve access to finance for SME.

Manufacturing SMEs are known to face difficulties in getting access to finance. Indeed, it was reported that only 15.4% of financing by financial institutions was channeled to SMEs in the manufacturing sector as compared to 61% which was channeled to SMEs in the services sector. Since majority of Malaysian companies in the manufacturing sector are SMEs and they contribute significantly to the total Malaysian GDP thus this study will bring significant contribution to the body of knowledge.

### 5.3 Implications of the Study

This study has both theoretical and practical implications. These implications are discussed in this section.

#### 5.3.1 Theoretical Implications

This study contributes to the body of knowledge and has theoretical, contextual and practical implications. Based on the results of this study, it can be concluded that there is a significant relationship between an SME's creditworthiness and its access to finance. Additionally, among the elements of creditworthiness, an SME's character is the most important criterion when it comes to getting access to external finance as it is repeatedly shown to have significant relationship with access to finance regardless of whether the SMEs have or do not have linkages with large firms. Interestingly, the capacity or capability to repay the debt has been shown to have negative relationships to accessing external finance. The study also proves that inter-firm linkages improve relationship between an SME's condition and its access to finance.

With respect to the theoretical implications, the study reaffirms the Relational Network Theory in the sense that when competing for external finances, competitive advantage is created from linkages with large firms as an external resource in the relational network. Due to the relational network, collateral is strengthened and condition is improved. These improve the SMEs' internal resources, thus enhancing the SMEs' creditworthiness.

The result also complements the Pecking Order Theory since it shows that the relationship between capacity and access to finance is negative although insignificant. This suggests that as SMEs are more capable in generating profit and

able to commit for repayment, their access to external finance is reduced. The Pecking Order Theory explained that firms prefer internal finance rather than external finance due to the lower informational cost caused by asymmetric information (Frank & Goyal, 2003; Psillaki & Eleftheriou, 2015).

The result also highlights the issue of adverse selection. Having linkage with large firms reduces the importance of an SME's condition in evaluating its creditworthiness in the pursuit of granting finance. It can be argued that financial institutions giving out loans or funds to SMEs because they have linkages with large firms may not reflect the true creditworthiness of an SME and should be considered risky. If this is commonly practised by most financial institutions, adverse selection arises as the funds should have been given to a more creditworthy SMEs, even those without linkages to large firms.

### 5.3.2 Practical Implications

With regards to the practical implications, policy makers are urged to take the necessary actions following the result of this study. Instead of helping SMEs financially by designing various loan schemes, they should consider designing policies that encourage inter-firm linkages as these linkages improve SMEs' creditworthiness by improving the SMEs' access to finance during bad economic or business conditions. However, SMEs should keep in mind of the lock-in situation and approach banks with caution when applying for bank loans or renegotiating debt contracts.

This study also fills the gap in the literature as it provides contextual contribution. Inter-firm linkages have been widely explored in Malaysia but from the management perspective which includes value chain and innovation. Previous studies demonstrated the supply chain environment and explained the expectations, needs and challenges faced by the SMEs and large firms due to their linkage. This study adds to knowledge on inter-firm linkages related to SMEs from the financial perspective. Previous studies in the Malaysian context also investigated the factors influencing

banks' lending towards SMEs, or in other words, the creditworthiness of the SMEs from the banks' perspective. This study approached creditworthiness from the SMEs' perspective.

Previous studies on inter-firm linkages in Malaysia were carried out in the form of case studies or interviews. This study provides an empirical investigation of this issue using the survey method. This study chose SMEs as the respondent to capture the issue of access to finance and linkage from the SMEs' perspective. This study goes further by studying the moderating effect of linkages towards an SME's creditworthiness and its access to finance. Lastly, this study also assesses the creditworthiness of an SME via the 5C's which is more relevant in the Malaysian SME context as assessing SMEs' creditworthiness using financial data provides little usefulness due to the limited availability of financial data for SMEs.

#### **5.4 Limitations of the Study**

There are several limitations with regards to this study. First, this study can be biased as it considers the SMEs' creditworthiness (including all 5C's) from the SMEs' point of view. SMEs may tend to over-rate themselves. However, it was not possible to get SMEs' credit ratings from credit rating agencies in Malaysia as the information is private and confidential. This is also the same if the information on a particular SME's creditworthiness is gathered from banks as it is against the Financial Services Act 2013 where the information on the firms cannot be disclosed.

Second, this study was carried out only based on the respondents from the Federal Territory of Kuala Lumpur and the Selangor area. Since the respondents for this study are firms, only one answer can be gathered from one firm. Thus, the firms need to be approached with caution so as not to irritate them which may lead to rejection to participate in the survey. On top of that, the financial department is usually very busy at certain times as they need to attend meetings, prepare for financial reports such as quarterly and annual reports as well as be audited. Some firms require more

time to answer the survey. Apart from that, this study also had to consider the availability of SMEs with linkage to large firms in the area. This is why the study chose the Federal Territory of Kuala Lumpur and the Selangor area for the study location. Future studies can cover other geographical locations in order to have a more comprehensive understanding of the issues related to financing.

Thirdly, there is a limitation with regards to information gathered for inter-firm linkage. The study is only using a dichotomous variable to represent inter-firm linkage. Although the result managed to prove the significant moderating effects of inter-firm linkage towards the relationship between SME's access to finance and its collateral, and condition using PLS-MGA, it would be interesting to evaluate the relationships based on the strength of the linkage. When the respondent was asked the duration of their relationship with the large firms, they were unable to answer since they may not have been working for the company for that long while some were not so sure about the answer. Additionally, the lack monitoring system designed for SME linking programmes such as the Vendor Development Programme resulted in the agencies being unable to provide the necessary information with regards to inter-firm linkages. When asked about the linkage, the program depended solely on the large firm to monitor and execute the program thus not much information could be gathered from the relevant agencies. Large firms on the other hand refused to commit to provide information regarding their vendors.

All the theoretical contribution discussed previously is limited to the manufacturing SME context. The manufacturing and services sectors are different from each other. As highlighted before, there is huge gap in financing between the two sectors and manufacturing SME faces bigger financing challenges as only 15.4% finances in the year 2015 were given to manufacturing SMEs, compared to the 61% given to SMEs in services sector (SME Corp. Malaysia, 2016). Additionally, there are also differences in working capital, asset and collateral between the two sectors as manufacturing SMEs invest heavily on asset or machinery compared to the services sector, which focus on human resources.

Another limitation is that the SMEs are new and young firms. The creditworthiness which is indicated by the past records of firms' performance and repayment is not relevant for the case of young firms. As new firms may have just started their operations, some of them may not have applied for loans yet and some of them may not have proper documentation related to their performance. Thus, they have not established borrowing performance or borrowing character which was evaluated in this study. This is also the same case for the different legal status of firms. The sole proprietor and other types of business organisations have different organisational structures. For the sole proprietor, there is no separation between the owner and business. Thus, some of the questions asked with regards to owner contribution in capital and questions on firm's capital are the same. This is why some of the questions at the beginning of this study were dropped as they were found to be redundant during the pre-test stage. Perhaps in the future, a more focused study could be conducted to examine the differences between sole proprietorship and other business organisations.

### **5.5 Suggestions for Further Studies**

With regards to future studies, it would be interesting to look at the effect of inter-firm linkages using longitudinal study where the respondents are categorised according to different types of linkage and types of financing used. Longitudinal study will enable the researcher to evaluate whether the linkage is strengthened over time, how the organisational structure among firms has evolved and whether the availability of financing for the SMEs changes over the period of linkage. This can actually be carried out if surveys are used as part of the evaluation process of the Vendor Development Program (VDP). Vendor Development Program is a programme by the Malaysian government aimed at establishing the link between local SMEs and large firms in Malaysia. The relevant parties were approached regarding the Vendor Development Programme. Unfortunately, they did not have the list of vendors participating in the programme and solely trusted the large firms to realise the programme and conduct events related to this programme. Better monitoring and

maintenance of databases is encouraged for government projects aimed at mentoring small firms in order to understand the success/failure of the project.

It would also be interesting for future studies to look at the psychological aspect of SME financing such as the reasons for SMEs not applying for financing. Perhaps, some SMEs do not need the financing or it could possibly be related to other reasons such as fear of loan rejection, fear of the consequences (due to weak financial literacy and financial knowledge, not confident of being able to repay the loan and the unknown/hidden charges), not having the motivation to apply (due to the number of paperwork involved, the long waiting/processing time or having been rejected too many times before), and also the reporting dilemma of SMEs. SMEs may be in dilemma to report their profit (or even exaggerate their profit) in order to secure external financing. Apart from that, it is also interesting to study the SMEs' perspective on loan terms for those that applied for loans. Focus should be given on terms and conditions such as the interest rate, maturity of loan, the amount of paperwork, waiting time, fees and commissions, SME's current debt level, collateral and guarantor requirement. All these will be the indicators of access to finance for those who applied for loans while the psychological aspect should be examined for those who did not apply for finance.

The aspect of loan repayment was not studied here. It would be interesting to study the effect of linkage with large firms on SMEs' repayment performance. Getting finance is one thing, but having the ability to repay is another.

Apart from that, a more in-depth study can be carried out on inter-firm linkages. Although the effects of inter-firm linkage on the relationship between access to finance and firm borrowing capacity, capital, borrowing character, collateral and economic condition have been addressed in this study, there is still much more that can be studied with regards to inter-firm linkages. As Van Gils & Zwart (2004) suggested, dependency and resource sharing can determine the type of linkage and the strength of linkage, thus it may be possible that inter-firm strengths can have different effects on access to finance as well. Additionally, firms with different types of linkage



possibly use different types of financing. For example, firms in the vertical linkage depend more on loans and trade credit while subsidiary/branch firms tend to use more equity and group lending. The unavailability of a database of small firms with links to large firms (or those participating in the Vendor Development Programme) and the unwillingness of large firms to provide information on the firms under their mentorship are some of the reasons why it was not possible to study effects of linkages in depth in this study. Therefore, it is suggested that government agencies dealing with inter-firm collaborations encourage the dissemination of information for research purposes in order to realize the purposes of the collaborations and to overcome challenges related to these collaborations.

Apart from that, the government should focus on creating more linkage programmes or encourage such linkages by designing new policies or perhaps enhance the tax policies to encourage participants of such linkages from both large firms and SMEs since this study has found that SMEs do benefit from such linkages with large firms. The policies designed should be specific as to cater for the different types of SME characteristics whether it is independent, subsidiary or a branch of a bigger firm.

In addition, the government should encourage assistance and training, and priority should be given to micro and small firms as these are the groups that are having difficulties to reach out to external finance, represented by the high proportion of non-application of loans. Although the reasons behind the non-application is not part of this study, fear of rejection, not requiring financing and being demotivated are some reasons given by the SMEs that participated in this study.

## 5.6 Conclusion

The emphasis of this study has been on the role of inter-firm linkage towards access to finance for SMEs. Inter-firm linkages are shown to influence the relationship between an SME's access to finance and its collateral and condition.

When running the model using only the data from SMEs with linkage, it was found that collateral has significant negative relationship towards access to finance. However, when only data from SMEs without linkage were considered, it was found that collateral has an insignificant relationship with access to finance. This moderating effect was found to be significant. Linkage therefore plays an important role as a moderator as it is able to change the relationship between collateral and access to finance. Linkages with large firms help SMEs when building assets as the large firms often become the guarantors for the SMEs which strengthen the relationship between collateral and access to finance for SMEs with linkage. Unfortunately, SMEs relationship with their house banks may result in a lock-in situation because switching mortgages to another bank would involve extra transaction cost (Menkhoff, Neuberger, & Suwanaporn, 2006).

Apart from that, business conditions can also greatly affect access to finance for SMEs without linkage. These show that lenders tend to relax or show leniency when deciding to lend to SMEs with linkages due to the effect of the large firms' reputation and credibility as well as the role of guarantor played by the large firms (Navas-Alemán, Pietrobelli, & Kamiya, 2012).

Additionally, SMEs with links to large firm have significantly higher capacity, higher capital and better business condition. SMEs' capacity is enhanced through large volumes of product demand or sales and profitability. SMEs' capability to repay their debt then is translated into good repayment history which represents good borrowing character. Additionally, lenders tend to relax or show leniency when deciding to lend to SMEs with links to large firms due to the effect of the large firms' reputation and credibility as well as the role of guarantor played by the large firms. Thus, it is advantageous for SMEs to develop links with large firms and the government should encourage such collaborations in order to provide the opportunity for small firms to build relationships with large firms.

## APPENDIX

### SURVEY



Dear respected Finance Officer,

My name is Nabila M.Nurdin and I am a graduate student of Multimedia University, MMU. This questionnaire is part of a research study. We are selecting respondents who are Finance Officers in Malaysian manufacturing SMEs operating in KL & Selangor. Therefore, we would like to invite you to participate in this research study by completing the attached survey which will require approximately 15 minutes of your time.

Your active participation, honest and genuine response will be highly appreciated. Hereby, I declare that all the information given will be held confidential and only group data will be made available.

Thank you for taking time to assist in this research study. The data collected will provide useful information to help understand SME access to finance & may influence the government policies. If you would like a summary copy of this study, or require additional information, feel free to contact or email as per below information. You may also report any complaints if you are not satisfied with the manner in which this study is being conducted.

The return of this survey is highly significant to the outcome of the study. Thus, we thank you for your contribution to this important survey and I wish you the best in your future endeavors.

Sincerely,

Nabila M.Nurdin  
013-2777 637  
nabila\_nurdin@hotmail.com

Kindly submit the survey via call/email/fax/post to:-  
NABILA NURDIN  
FACULTY OF MANAGEMENT (FOM)  
MULTIMEDIA UNIVERSITY (MMU CYBERJAYA)  
63100 CYBERJAYA, SELANGOR  
Contact No: 013-2777 637/ Fax:  
Email: nabila\_nurdin@hotmail.com

## SECTION A: BACKGROUND OF FIRM

- 1) Legal status of firm :(choose only one)
- Sole proprietorship
  - Partnership
  - Private Limited Company
  - Not registered with Companies Commission of Malaysia

- 2) In which year was your firm first registered?
- .....

- 3) Products manufactured classification (according to International Standard Industrial Classification (ISIC) code) (tick ONE only)

Code	Classification	(√) Tick ONE only
1	Food products and beverages	
2	Tobacco products	
3	Textiles	
4	Wearing apparel; dressing and dyeing of fur	
5	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness & footwear	
6	Wood and of product of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	
7	Paper and paper products	
8	Publishing, printing and reproduction of recorded media	
9	Coke, refined petroleum products and nuclear fuel	
10	Chemicals and chemical products	
11	Rubber and plastic products	
12	Other non-metallic mineral products	
13	Basic metal	
14	Fabricated metal products, except machinery and equipment	
15	Machinery and equipment N.E.C.	
16	Office, accounting and computing machinery	
17	Electrical machinery and apparatus N.E.C.	
18	Radio, television and communication equipment and apparatus	
19	Medical , precision and optical instruments, watches and clocks	
20	Motor vehicles, trailers and semi-trailers	
21	Other transport equipment	
22	Manufacture of furniture, manufacturing N.E.C.	
23	Recycling	

- 4) Annual Sales Turnover/ Total Revenue (choose only one)
- Less than RM300,000 (micro enterprise)
  - Between RM300,000 – RM15 Million (small enterprise)
  - Between RM15 Million – RM50 Million (medium enterprise)
- 5) How would you characterize your firm? (choose only one)
- A non-profit enterprise
  - A subsidiary of another enterprise
  - A branch of another enterprise
  - An autonomous profit-oriented enterprise, making independent financial statements & financial decisions

- 6) Highest Education level of finance officers
- Professional degree (CFA, ACCA or equivalent)
  - Master's or doctorate degree
  - Bachelor's degree
  - Diploma's degree
  - High school (SPM)

## SECTION B: ACCESS TO FINANCE

- 1) Circle to indicate your level of agreement with the following statements with regards to your company's access to finance:

"1" is **STRONGLY DISAGREE** and "5" is **STRONGLY AGREE**

	ACCESS TO FINANCE	SD ← → SA
1	Financial services are easily available to us when needed/desired.	1 2 3 4 5
2	Financial services are easily accessible to us.	1 2 3 4 5
3	The size of loan available is sufficient to meet the needs of our company.	1 2 3 4 5
4	The total cost of accessing to the financial services is low.	1 2 3 4 5
5	There is a wide range of financial services available to us.	1 2 3 4 5
6	The quality of financial services offered to us is very good.	1 2 3 4 5
7	Our company is able to access finance repeatedly.	1 2 3 4 5
8	The financial products available/offered are tailored to the needs of our company.	1 2 3 4 5

- 2) Have you applied for external finance from the banks in the last 12 months and what was the outcome?
- Applied and approved
  - Applied but rejected
  - Did not apply

## SECTION C: CREDITWORTHINESS

Please circle to indicate on a scale of 1 to 5 where "1" is **STRONGLY DISAGREE** and "5" is **STRONGLY AGREE**.

Ref	CONDITION	SD ← → SA
3	Our firm has a good firm-specific outlook with respect to sales, profitability or business plan.	1 2 3 4 5
4	Our business has growth potential.	1 2 3 4 5
5	There is huge demand for our product.	1 2 3 4 5
12	Regulations, politics and environment have little effect on our business.	1 2 3 4 5
14	Inflation has small impact to our balance sheet and cash flows.	1 2 3 4 5

Ref	CAPITAL	SD ← → SA
1	The owner(s) have invested huge capital (financial commitment) in the firm.	1 2 3 4 5
2	Our past and projected cash flows are adequate.	1 2 3 4 5
3	Our firm record shows strong past earnings, dividends, and sales.	1 2 3 4 5
4	Our firm has adequate liquid reserves.	1 2 3 4 5
5	Our firm has high turnover of payables, account receivables & inventory.	1 2 3 4 5
7	Our firm has good control over our expenses.	1 2 3 4 5

Ref	COLLATERAL	SD ← → SA
1	Our firm is able to provide required collateral.	1 2 3 4 5
2	The value of our collateral is high.	1 2 3 4 5
3	Our firm is able to provide quality guarantors as per bank requirement.	1 2 3 4 5
4	Our firm owns most of our assets (land, buildings, vehicle, machinery, equipment).	1 2 3 4 5
9	Leases and mortgages issued against property and equipment are small.	1 2 3 4 5
11	Banks have high relative position as creditor in placing claim against our assets.	1 2 3 4 5

Ref	CAPACITY	SD ← → SA
1	Our firm is able to handle our debt capacity.	1 2 3 4 5
2	Our firm successfully managed our payments/commitments in the past.	1 2 3 4 5
3	Our firm has other assets that can be liquidated/sold.	1 2 3 4 5
4	Our firm is able to repay our debt.	1 2 3 4 5
5	Our firm's owners have manageable personal financial commitment.	1 2 3 4 5
6	Our firm has strong cash flows & financial viability.	1 2 3 4 5

Ref	CHARACTER	SD ← → SA
2	Our firm has never defaulted on our loan/debt.	1 2 3 4 5
3	Our firm's owner(s) has never defaulted on their personal loan.	1 2 3 4 5
4	Banks are willing to provide credit to our firm.	1 2 3 4 5
6	Investors are willing to invest in our firm.	1 2 3 4 5
7	Other lenders have good lending experience with us.	1 2 3 4 5
8	Our firm is able to provide many guarantors/referrals.	1 2 3 4 5
10	Our firm has good credit rating.	1 2 3 4 5

#### SECTION D: INTER-FIRM LINKAGES

This section meant to understand the linkages that may have been establish between SMEs and large firms.

*[Linkages refer to the inter-firm relationships which include mentor-mentee, buyer-seller or business partner relationship]*

- 1) Does your firm have any link with a well-established large firm?  
*[Large firm refer to firm with sales turnover of more than RM50 millions or more than 200 full time employees]*  
 Yes                       No

If you have answered "Yes" in the question above, please proceed with the questions below.

- 2) In which year did your firm start supplying to any large firm: .....

**THANK YOU FOR YOUR PARTICIPATION**

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## LIST OF PUBLICATION

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- [1] Wasiuzzaman, S., Nurdin, N., Abdullah, A. H., Vinayan, G., Financing for SMEs: Do All Banks Apply the Same Lending Technologies?, 2016 Recent Research in Social Sciences International Conference (SOCSIC) (SOCSIC'2016), Bandung, Indonesia, 31 May – 2 June 2016.
- [2] Wasiuzzaman, S., Nurdin, N., Abdullah, A. H., Vinayan, G., Access to Credit for SMEs via Inter-firm Linkages in the Malaysian Manufacturing Industry, IFABS Asia 2016 Brunei Conference, Bandar Seri Begawan, Brunei, 16 – 18 August 2016.

### JOURNAL ARTICLE

- [1] Wasiuzzaman, S., Nurdin, N., Debt Financing Decisions of SMEs in Emerging Markets: Empirical Evidence from Malaysia, International Journal of Bank Marketing
- [2] Wasiuzzaman, S., Nurdin, N., Abdullah, A. H., & Vinayan, G. (2016). Financing for Small and Medium Enterprises: Do All Banks Apply the Same Lending Technologies?. Advanced Science Letters, 22(12), 4221-4224.