



Faculty of Economics and Business

Characteristics of *Sukuk* and Their Influence on Financial Stability of Malaysian Firms

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Characteristics of *Sukuk* and Their Influence on Financial Stability of Malaysian Firms

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DECLARATION

I, Chen Xiaoting (15020175, Faculty of Economics and Business) hereby declare that the work entitled “Characteristics of *Sukuk* and Their Influence on Financial Stability of Malaysian Firms” is my original work. I have not copied from any other students’ work or from any other sources where due to reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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ABSTRACT

Financial stability and *Sukuk* expanded into the financial market quickly after the global financial turmoil which had happened from 2007 to 2008. The economy globalization has made financial stability difficult to achieve. While Malaysia's *Sukuk* market is arguably the most prominent in Islamic finance globally, the inherent nature of *Sukuk* gives it better security on the premise of guaranteed firms' financial stability and returns to investors. This study aims to evaluate the degree of Malaysian firms' financial stability which could be influenced by the characteristics of *Sukuk* and also firms' characteristics. Sixty-one out of 164 companies that were listed on Bursa Malaysia which issued *Sukuk* have been selected for this study, and the issuance took place from 1997 to 2017. Subsequently, the firms' financial stability was treated as default probability and determined by using Naïve Distance to Default (DD) which was developed by Bharath and Shumway. Descriptive analysis and Ordinary Least Squares (OLS) were employed in this study, and the results of the analysis confirmed that *Sukuk* could promote the firms' financial stability. Among the important variables related to the characteristics of *Sukuk* that were found to influence financial stability were the intensity of *Sukuk* and the proportion of *Sukuk*. They were found to be positively and significantly influenced the firms' financial stability. The control variables which include the firm size, valuation, solvency, and profitability have also affected the firms' financial stability significantly. The findings provide evidences that Malaysia should play more active role in promoting the development of *Sukuk* market, and at the same time should be aware that financial stability is a systematic element which involved many complex factors. Thus, it is essential for companies and countries to comprehensively grasp the financial stability from macro and micro perspectives.

Keywords: *Sukuk*, financial stability, Malaysian firms, Naïve Distance to Default

Ciri-ciri Sukuk dan Pengaruhnya Terhadap Kestabilan Kewangan Firma-firma Malaysian

ABSTRAK

Kestabilan kewangan dan Sukuk telah berkembang ke pasaran kewangan dengan pantas selepas kegawatan kewangan global yang berlaku pada tahun 2007 - 2008. Globalisasi ekonomi telah menjadikan kestabilan kewangan lebih sukar diuruskan. Didapati bahawa pasaran Sukuk di Malaysia adalah yang paling menonjol dalam pembiayaan Islam di seluruh dunia, dan sifat Sukuk boleh memberikan jaminan yang lebih kekal atau lebih baik kepada kestabilan kewangan firma dan pelabur. Oleh itu, kajian ini akan menilai kestabilan kewangan firma di Malaysia yang mungkin bergantung kepada pembangunan Sukuk. Sebanyak 61 daripada 164 syarikat tersenarai di Bursa Malaysia yang menerbitkan sukuk pada tahun 1997 hingga 2017 telah dipilih untuk kajian ini, dan Naïve Distance to Default (DD) yang dicadangkan oleh Bharath dan Shumway telah dirujuk untuk mengukur kestabilan firma. Selain itu, analisis deskriptif dan penganggar ganda dua terkecil biasa (OLS) telah digunakan dalam kajian ini. Keputusan kajian ini telah mengesahkan bahawa pembangunan Sukuk dapat mempromosikan kestabilan kewangan firma. Antaranya, intensiti Sukuk dan kedar kupon Sukuk mempengaruhi kestabilan kewangan firma secara ketara. Di samping itu, hasil kajian ini mendapati pembolehubah kawalan yang boleh mempengaruhi kestabilan kewangan firma secara signifikan termasuk saiz firma, penilaian firma, kesolvenan dan keuntungan. Hasil kajian ini menunjukkan bahawa pihak berkuasa Malaysia perlu membuka pasaran untuk mempromosikan pembangunan pasaran Sukuk, di samping memberi perhatian kepada kestabilan kewangan kerana hanya itu adalah satu elemen yang sistematik dan melibatkan banyak faktor yang kompleks. Dari perspektif makro dan

mikro, ia adalah penting bagi syarikat dan negara untuk memahami kestabilan kewangan secara komprehensif.

Kata kunci: *Sukuk, kestabilan kewangan, firma Malaysia, Naïve Distance to Default*

TABLE OF CONTENT

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
ABSTRAK	v
TABLE OF CONTENT	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
CHAPTER 1: INTRODUCTION	1
1.1 Introduction	1
1.2 Background of the Study	3
1.2.1 The Development of Financial Stability	3
1.2.2 The Development of <i>Sukuk</i>	6
1.2.3 The Differences between <i>Sukuk</i> and Conventional Bond	9
1.2.4 The Issuance of <i>Sukuk</i>	10
1.3 Problem Statement	13
1.4 Objectives of the Study	15
1.4.1 General Objective	15
1.4.2 Specific Objectives	15
1.5 Significance of the Study	15
1.6 Organization of the Study	16

CHAPTER 2: LITERATURE REVIEW	18
2.1 Introduction	18
2.2 Empirical Studies of Financial Stability	19
2.2.1 The Definition of Financial Stability	19
2.2.2 Financial Stability of Nation/Country and Firm	23
2.3 Empirical Studies of <i>Sukuk</i>	31
2.3.1 The Definition of <i>Sukuk</i>	31
2.3.2 Types of <i>Sukuk</i>	33
2.3.3 Studies Related to <i>Sukuk</i>	41
2.4 Empirical Studies on Bond/ <i>Sukuk</i> and Financial Stability	47
2.5 Theoretical Framework	50
2.5.1 Empirical Model of Financial Stability	50
2.5.2 Reviews of the Theories	59
2.6 Summary	60
 CHAPTER 3: METHODOLOGY	 62
3.1 Introduction	62
3.2 Conceptual Framework	63
3.3 Data Description	70
3.4 Forecasting Model of Financial Stability	73
3.4.1 The Merton Distance to Default (DD) Model	74
3.4.2 The Bharath and Shumway Model	78
3.5 Specification of Model	82
3.6 Data Analysis	84

3.6.1	Key Parameters of Distance to Default (DD)	86
3.6.2	Descriptive Analysis	87
3.6.3	Multiple Regression Analysis	88
3.6.3.1	Ordinary Least Squares (OLS)	88
3.6.3.2	Diagnostic Testing	90
3.7	Summary	94
CHAPTER 4:	RESULTS AND DISCUSSION	95
4.1	Introduction	95
4.2	Descriptive Analysis	95
4.3	Diagnostic Testing	99
4.3.1	Heteroscedasticity	99
4.3.2	Multicollinearity	100
4.3.2.1	Correlation Coefficient	101
4.3.2.2	High Variance Inflation Factors (VIFs)	103
4.4	Multiple Regression Model	104
4.5	Summary	110
CHAPTER 5:	CONCLUSION	113
5.1	Introduction	113
5.2	Summary of Findings	113
5.3	Policy Implications	116
5.4	Limitations and Suggestion for Further Studies	117
REFERENCES		118
APPENDIX		129

LIST OF TABLES

	Page
Table 1.1 <i>Sukuk</i> (Islamic Bond) versus Conventional Bond	10
Table 2.1 Variables used by Hmida and Brahmi (2016)	52
Table 2.2 Variables used by Orazalin et al. (2019)	58
Table 3.1 Definition of Variables	69
Table 3.2 Sample Selection Procedure	72
Table 3.3 Analysis of Sample Companies	85
Table 4.1 Descriptive Analysis of Variables	96
Table 4.2 White's Test Results	100
Table 4.3 Correlation Coefficient Table	102
Table 4.4 Results of the Multicollinearity Tests	104
Table 4.5 Ordinary Least Squares (OLS) Results	105
Table 4.6 Summary of Relationship Tested Based on Specific Objectives	112

LIST OF FIGURES

	Page
Figure 1.1 Global <i>Sukuk</i> Issuance from 1999 to 2014 (billions of USD)	7
Figure 2.1 Global <i>Sukuk</i> Structure Trend from 2010 to 3rd Quarter 2014 (billions of USD)	34
Figure 2.2 The Structure of <i>Sukuk</i> al Ijara	35
Figure 2.3 The Structure of <i>Sukuk</i> al Murabaha	37
Figure 2.4 The Structure of <i>Sukuk</i> al Musharaka	39
Figure 3.1 The Relationship between Dependent Variable and Independent Variables	64

CHAPTER 1

INTRODUCTION

1.1 Introduction

Financial stability and *Sukuk* expanded into financial industry swiftly and become the recent interest after the global financial turmoil which happened in 2007 and 2008 (Taoual, 2016; Dusuki, 2010). Financial stability is a kind of balanced state where the function of the financial intermediaries' program runs smoothly and the market participants believed that the main financial institutions and markets within the economy will operate well (Bank Negara Malaysia, 2015b). Financial stability was first used by the Bank of England (BoE) in 1994 to describe its goals which were not to do with price stability or financial system's effective operation (Allen & Wood, 2006). East Asian financial crisis which happened in the 90s might be the main catalyst for the development of financial stability. Since then, increasing attention has been given to financial stability due to the market volatility and more frequency and intensity of financial crisis (Morris, 2010; Alawode & Sadek, 2008; Allen & Wood, 2005; Bank of Canada, 2003; Sundararajan et al., 2002).

A sound, stable and healthy financial system is of great significance and indispensable to a country and a stable financial system helps the country allocates resources efficiently, distributes risk across the whole economy, and absorbs shocks effectively (Bank Negara Malaysia, 2015b). However, financial instability could spread throughout and have the spillover effects to the other sectors of economy, and it might be the blasting fuse of the financial crisis as for its adverse consequences for the economy. These factors contribute to the high cost of financial instability and adverse impact on the economy (Bank Negara Malaysia, 2015b).

Like financial stability, *Sukuk* is also relatively a new term that has been introduced into financial system. It is a *Sharia*-complied asset-backed financial instrument which can be referred as Islamic bond and usually treated as one substitute of conventional bond (Alshamrani, 2014; Saeed & Salah, 2014; Jamaldeen, 2012; Wilson, 2004). As one of the most popular instruments under Islamic finance, *Sukuk* represents undivided interest or shares in the ownership of the underlying asset, where profit and cash flow will generate via this kind of ownership, meanwhile, the relative risk matched with those benefits should be borne by its owner (Franklin Templeton Investment, 2014). *Sukuk* market may be thought as a late bloomer compared with banking and equity market, and the modern history of the Islamic finance industry is considerably young which was just began about the 1970s (Jamaldeen, 2012). Based on the data gathered, *Sukuk* was first introduced to the global world with only \$600 million in 2002 and the issuance amount reached to \$118.84 billion in 2014 within only twelve years, which was an increase of approximately \$9.85 billion per year (Thomson Reuters, 2015; Malaysian International Islamic Finance Centre, 2015a).

Needless to say, Malaysia is the pioneer and leader of the *Sukuk* market. Malaysia occupied the first position with a sizeable 42.3% of total issuances in the first quarter of 2015, followed by the United Arab Emirates (UAE) with 18.2% and then Indonesia accounted for 14.1% share (Malaysian International Islamic Finance Centre, 2015a; Islamic Finance News, 2015). The *Sukuk* market has been performing well and widely received among the contemporary global financial industries. *Sukuk* investors are widely spread across Asia, the Middle East, Europe and the United State (Shahida & Sapiyi, 2013). In addition, *Sukuk* issuers are also increase along with the growing demand. The United Kingdom, Luxembourg, South Africa, Senegal, Hong Kong and a major Western bank, Goldman Sachs, became the

participants of *Sukuk* issuers in 2014 (Islamic Finance News, 2015). Those growing trends have made *Sukuk* market the most notable achievement in the development of Islamic capital market and has received a great deal of attention after the global financial crises of 2007 and 2008 (Jamaldeen, 2012; Dusuki, 2010). Several years have passed since financial stability and *Sukuk* came into the spotlight, but research on both has been scanty. Thus, the contribution of *Sukuk* towards financial stability is very crucial.

1.2 Background of the Study

This section includes the discussion on the development of financial stability, the development of *Sukuk*, the difference between *Sukuk* and conventional bond, and the issuance of *Sukuk*.

1.2.1 The Development of Financial Stability

Financial stability refers to the smooth operation of financial intermediation where the market participants have full confidence in the operation of major financial institutions and markets (Bank Negara Malaysia, 2015b). Financial stability is a product of the modern financial world and it is a quite new concept. The high cost and increased frequency of financial crisis, the rapid growth of financial transaction volume, as well as the intricacy of new financial trading tools, could be the main activators that make financial stability issue receives a widespread attention for policy makers and research scholars in recent years (Creel, Hubert & Labondance, 2015; Beck, Degryse & Kneer, 2014; Morris, 2010; Alawode & Sadek, 2008; Cihak, 2007a; Cihak, 2007b).

The Bank of England might be a precursor of financial stability development. For the first time in 1994, financial stability has been chosen as the Bank of England's objective which does not related to price stability and financial system's effective operation (Allen & Wood, 2005). Two years later, in 1996, the Bank of England published financial stability review to emphasize the significant progress that has affected the financial system stability, as well as to generalize the newest concepts related to risk, regulation and market institutions. The Financial Stability Review was officially renamed as the Financial Stability Report (FSR) in 2006 to show its contents and targets preference (Bank of England, 2015; Allen & Wood, 2005). Financial Stability Report (FSR) has shown its importance to the country and therefore became the primary objective of most central banks around the world; about 80 central banks committed to publish their report by 2011 (Cihak, Munoz, Sharifuddin & Tintchey, 2012). Malaysia has also started to publish its financial stability and payment systems report from 2006 as a response to the booming of financial transactions, more complexity of financial markets and closer interaction of the global economy.

Furthermore, international institutions also keen to track financial stability from worldwide. The World Bank and the International Monetary Fund (IMF) introduced the Financial Sector Assessment Program (FSAP) in 1999, aimed at assessing regularly on the strengths and weaknesses of financial systems in their member countries (Alawode & Sadek, 2008). In addition, the International Monetary Fund (IMF) issued the first Global Financial Stability Report (GFSR) in 2002 to assess financial trends and market developments across the globe (International Monetary Fund, 2017). Besides, as early as 1997, the Bank for International Settlements (BIS) realized the importance of financial stability. Under the joint efforts of Japan, the United States, the United Kingdom, Sweden and other countries, a

unified and coordinated international principles and practices were developed to promote financial stability at the international level (Bank for International Settlements, 1997).

Financial stability is mainly considered in the context of macro-economy, and regarded as a necessary condition for the normal operation of the entire national economic system to achieve the stable economic growth (Pera, 2017; Bank of England, 2015; Bank Negara Malaysia, 2015b; Rosengren, 2011; Schinasi, 2004). Similar with the financial stability at the national level, this concept is also the main goal of a company and treated as an indispensable condition for the long-term sustainable development of the company (Cernavskis, 2014). Financial stability of a company means that even in the presence of disturbances, the company can stick to its development goals, withstand shocks and quickly return to the development path (Pera, 2017). At the same time, Cernavskis (2014) and Pera (2017) believed that stability can be treated as solvency, and according to this, a company's financial stability is to have enough free cash flow available to repay the company's short-term and long-term debt.

In terms of the measures of financial stability, lots of methods have been used. In the perspective of firm level, Z-score model and Merton distance to default (DD) model are mainly adopted for the measurement of company's financial stability. Among them, the Merton DD model is easily to be modified, for example, Bharath and Shumway's naïve DD model was developed based on Merton DD model and its naïve DD was used as one proxy of financial stability from firm level (World Bank, 2016; Bharath & Shumway, 2008). Besides, in the perspective of country level, to aggregate the company's financial stability indicators into a national level, First-to-Default probability, System Expected Shortfall

(SES), distribution of systemic loss and a range of indicators of financial soundness are the common measurement of financial stability for a country (World Bank, 2016).

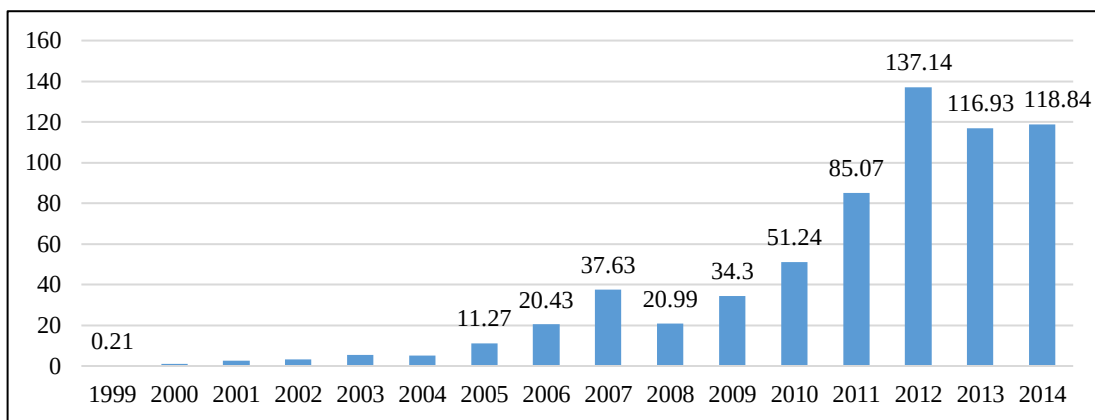
All of those works offered valuable insights into the structure of financial systems. Those works provided a rich source not only for the public but also for policy makers as well as for scholars and researchers to understand and study the complex financial world more intuitively.

1.2.2 The Development of *Sukuk*

Islamic finance was originally considered as a financial instrument of Muslim countries only; but as for today, it has shown its powerful financing strength and ability to resist risks and to become an integral part of the financial world stage. *Sukuk* market could be the most shining star among Islamic finance. Meanwhile, the growth of the *Sukuk* market globally also shown promising result in the Islamic capital markets (Dusuki, 2010).

The history of *Sukuk* could be traced back to 1983 when the Central Bank of Malaysia attempted to overcome the Islamic banks' liquidity problem for the first time (Rezaei, 2013; Jamaldeen, 2012). Actually, the real first Islamic bond that was called *Muqarada* bond was introduced by Jordan Islamic Bank in 1978. After this, in 1990, multinational Shell Malaysia, a non-Islamic company, issued the world's first ringgit *Sukuk* worth \$33 million. As for this development, most scholars now take regard for Malaysia as the birthplace of the first *Sukuk* in the world (Jamaldeen, 2012). However, after this, there was no other *Sukuk* was issued until the first global *Sukuk* worth \$600 million issued by Malaysia sovereign in 2002, and that was the first time for *Sukuk* to appear on world financial market (Malaysian International Islamic Finance Centre, 2015b; Rezaei, 2013; Jamaldeen, 2012; Zaidi, 2008).

The growth of the *Sukuk* market has been rapid and has made gratifying achievements. Only twelve years later after the first global issuance, the amount of *Sukuk* issuance has reached \$118.84 billion in 2014. As depicted in Figure 1.1, it is clearly shown that the issuance of *Sukuk* is increasing promptly, especially during the financial crisis of 2007 and 2008. The global circulation of *Sukuk* in 2006, 2007, 2008 and 2009 was \$20.43billion, \$37.63 billion, \$20.99 billion and \$34.3 billion respectively. Its issuance rapidly rebounded to \$34.3 billion in 2009 after a brief decline in 2008, which was higher than the circulation in 2006. Hereafter, the *Sukuk* market reached a total issuance of \$137.14 billion in 2012 with an average annual growth rate of about 60% globally (\$51.24 billion in 2010, \$85.07 billion in 2011 and \$137.14 billion in 2012) (Malaysian International Islamic Finance Centre, 2015a).



Sources: Thomson Reuters (2015), Malaysian International Islamic Finance Centre (2015a)

Figure 1.1: Global *Sukuk* Issuance from 1999 to 2014 (billions of USD)

Besides, the increasing number of economic entities that has showed their interest in *Sukuk* market, such as sovereigns, multilateral institutions, multinational and national corporations both from developed and emerging economies has finance investments in a wide range of economic activities and development projects and so on. Furthermore, the

Sukuk market is no longer limited to Islamic countries and active in more than 20 countries globally, and its investors are spread across Asia, the Middle East as well as Europe. In addition, *Sukuk* issuances in international reserve currencies became colorful, such as Malaysian Ringgit (MYR, RM), US Dollar (USD, \$), Indonesian Rupiah (IDR, Rp), British Pound (GBP, £), Chinese Renminbi (RMB, ¥) and so on (Aziz, 2014).

Malaysia is the world's largest Islamic founder and has been the pioneer of *Sukuk* development (Oladunjoye, 2014; Rezaei, 2013; Alhabshi, 2013). The latest data showed Malaysia continue to be accounted for the first place with 50.4% of total global *Sukuk* shares in 2018 (Malaysian International Islamic Finance Centre, 2019). Other countries also participated in *Sukuk* market actively, such as Saudi Arabia, Kuwait, Bahrain, Indonesia, Brunei, Pakistan, Gambia, UAE and so on (Said & Grassa, 2013; Zaidi, 2008).

Saudi Arabia is considered as the second-largest player in the Middle East for Islamic finance with 30% of its total financial assets are in Islamic finance products. In 2004, the first *Sukuk* of the Kingdom of Saudi Arabia (KSA) was issued on behalf of HANCO Rent-A-Car (Alshamrani, 2014; Jamaldeen, 2012). Bahrain is another world's leader in Islamic financial services with a dual banking system. As the first issuer of Bahrain, Bahrain Monetary Institute issued \$25 million government bills in accordance with Islamic law within the scope of Persian Gulf states in 2001 (Rezaei, 2013; Wilson, 2004). In the year of 2007, the highest exchange happened in the Dubai International Financial Exchange (DIFX) with \$10.43 billion of *Sukuk* list on it (Alshamrani, 2014). On 3rd August 2012, Kazakhstan becomes the first country in the former Soviet Union to issued *Sukuk* with \$75 million via the Development Bank of Kazakhstan (Khaki & Mailk, 2013).

In addition, more and more non-Muslim countries are also been attracted to participate the *Sukuk* market. England became the first non-Muslim country to issue sovereign *Sukuk* with a five-year maturity of \$0.35 billion on 25th June 2014 (Edwards, 2014). Hong Kong also issued \$1 billion *Sukuk* successfully on 11th September 2014 (Rezaei, 2013; Hanefah, Noguchi & Muda, 2013). Government of Ningxia Hui autonomous region signed an agreement whit AVIC securities to decide to issue \$1.5 billion *Sukuk* on 24th December 2014 (China Development, 2015).

1.2.3 The Differences between *Sukuk* and Conventional Bond

Usually, *Sukuk* can be treated as one alternative to conventional bond which complied with *Sharia* laws (Jamaldeen, 2012). *Sukuk* and conventional bond are quite similar and have no such differences in terms of financial perspectives, this resulting in *Sukuk* rapid development, and sometimes, market participants directly to treat *Sukuk* as the conventional bond. However, *Sukuk* and conventional bond are distinctly different. One of the biggest differences between them is that *Sukuk* means ownership of underlying asset together with the associated risk and potential return while the conventional bond is the certificate of pure debt (Jamaldeen, 2012). Table 1.1 compares *Sukuk* and conventional bond side by side so that makes it clearer and easier to understand.

Table 1.1: *Sukuk* (Islamic Bond) versus Conventional Bond

Issue	<i>Sukuk</i> (Islamic Bond)	Conventional Bond
Ownership	• Consistent with the laws of <i>Sharia</i>. • Investors get the partial ownership of the <i>Sukuk</i>'s underlying asset. • Underlying assets must compliance with <i>Sharia</i> law.	• The investors do not have the ownership of the asset or business they support. • Representative borrowers owe the debt to the investors.
Investment criteria	• All the investment activities and each issuance process need compliant to <i>Sharia</i> laws.	• Do not have the special law to follow, just need to comply with the local legislation.
Meaning of per unit	• Represents a share of ownership of the underlying asset.	• Represents a share of debt.
Face value	• Based on the market value of the underlying asset.	• Based on the credit worthiness of issuer and its rating.
Investment rewards and risks	• Profit and loss come from the share of underlying asset. The principle amount not guaranteed by the issuer at maturity.	• Get the interest payment based on the regularly scheduled during bond period and the principle will return at the maturity date.
Costs and investor's profit	• Negative relationship existed between investors' profit and the cost of underlying asset.	• Investors are not affected by the performance of the underlying asset.
Invest area	• Prohibited to invest some area relate to gaming, tobacco, alcohol manufacturers and other include uncertainty.	• Do not have clear ban area.

Sources: Alshamrani (2014), Franklin Templeton Investments (2014), Jamaldeen (2012)

1.2.4 The Issuance of *Sukuk*

Although the types of *Sukuk* are numerous, three main parties involved when *Sukuk* is issued, which are obligator, trustee or issuer and investors. Sometimes, underwriter may also be included as an optional party (Jamaldeen, 2012). Obligator refers to a government or a corporation who will achieve some financial benefit via *Sukuk* issuance. Trustee or issuer is a part connecting the obligator and the investors and this part usually know as special purpose vehicle (SPV). Investors are the parties who hold the *Sukuk*. While underwriter usually acts as an insurance of SPV to guarantee any unsold *Sukuk* will be purchased. The involvement of underwriter is depending on the situation and usually does not bear the actual issue work (Jamaldeen, 2012). However, there is not much differences between *Sukuk* and

conventional bond issuance except that *Sukuk* have *Sharia* advisors and need to be in accordance with certain regulatory requirement and Islamic laws (Islamic Finance News, 2012).

Determination of the structure used is the first and foremost things when *Sukuk* issuance is initiated, because different types of *Sukuk* products require for different structures (Jamaldeen, 2012). There are fourteen (14) different types of *Sukuk* were acceptable in Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) *Sharia* standard 17, such as *Ijara*, *Mudaraba*, *Musharaka* and so on (Saeed & Salah, 2014; Hanefah et al., 2013). Besides, arrangers are the professionals or Islamic financial service providers who know the process of *Sukuk* well. They will aid the obligator to determine structure of *Sukuk*. With the help of arrangers, the obligators has the duty to describe six (6) items: 1) purpose of the *Sukuk*, the underlying assets set to directly benefit from the issuance; 2) legal issues or relevant regulations, issue *Sukuk* need to be approved by the relevant authorities for public offerings same as conventional bonds; 3) information about the obligators, business types, historical performance, board of directors as well as outstanding shares needs to be described in this item; 4) units, the number of *Sukuk* will be issued; 5) currency, currency used in the primary market transactions; and 6) structure, the details of Islamic contract used for this issue, *Ijara* or *Mudaraba* contract for instance (Jamaldeen, 2012).

Subsequently, the obligators will create a prospectus, which included general structure information and some necessary terms and conditions, such as the obligators' rating position according to the independent rating agencies. All kinds of potential risks involved in *Sukuk* issuance need to specify in the prospectus, such as, taxation and law issues, accidents caused

by early redemption, the *Sukuk* structure and its cash flow, the trust certificates' terms and conditions, the ownership of the issuer, the obligators' organization information and so on (Jamaldeen, 2012).

Next, the obligators will create an SPV also known as special purpose entity (SPE) or special purpose company (SPC) which acts as a separate legal entity to connect investors and obligators (Islamic Finance News, 2012; Jamaldeen, 2012). Usually, SPV registered in tax-efficient jurisdictions like Bahrain, thus it becomes more tax-efficient and capital-efficient and consequently it can provide the best service with the least transaction cost. During *Sukuk* tenure, SPV makes sure the underlying assets are kept and controlled separately. It is a tool to acquire underlying asset on behalf of the investors and take the legal ownership of the underlying asset because to transfer ownership to individual holders directly is unrealistic. Besides, SPV is a bankruptcy remote entity to protect the profit of creditors or parties once anything happened to originator (Islamic Finance New, 2012).

The regulatory approval before launching the *Sukuk* is deemed necessary (Jamaldeen, 2012). After the approval, *Sukuk* structure has to be selected, and SPV been created, then the *Sukuk* issuance begins. During this process, the underwriter may involve to ensure *Sukuk* issuance and to make sure SPV will buy all the unsold *Sukuk*. Sometimes, underwriter may serve as *Sukuk* issuer to the primary market. Usually, the issuer will implement some presentations to promote *Sukuk* to potential investors. Finally, the money is available to the issuer via SPV, and *Sukuk* certificates will issue to the investors with successful subscriptions (Islamic Finance New, 2012; Jamaldeen, 2012).

1.3 Problem Statement

Although the development of *Sukuk* has also been affected by financial crisis in 2007 and 2008, the performance of *Sukuk* during and after financial crisis deserves attention. As mentioned earlier, the global circulation of *Sukuk* increased 554% approximately from \$20.99 billion in 2008 to \$137.14 billion in 2012 (Malaysian International Islamic Finance Centre, 2015a). At the same time the development of *Sukuk* in Malaysia was propitious during the financial crisis where it accounted for half of the total stock of Malaysian corporate bonds in 2008 (Jobst, Kunzel, Mills & Sy, 2008), and corporate *Sukuk*'s issue amount as a percentage of total bond issuance was 65.5%, 47.6%, 53% and 57% in 2007, 2008, 2009 and 2010 respectively (Securities Commission Malaysia, 2010; Bank Negara Malaysia & Securities Commission Malaysia, 2009). The amount of *Sukuk* issued rebounded quickly after the crisis and continue to bloom in Malaysia and globally. Its outstanding performance demonstrated its ability to withstand the financial crisis.

In addition, with the growing popularity of the topics related to *Sukuk* and financial stability, some studies related to these issuers were developing. Scholars and relevant policy makers have affirmed the positive effects of *Sukuk* on financial stability. The Governor of the Central Bank of Malaysian (Bank Negara Malaysia), Dr. Zeti Akhtar Aziz gave a speech at the 10th World Islamic Economic Forum (WIEF) in 2014, she confirmed that the dynamism of the *Sukuk* market has contributed towards strengthening financial stability (Aziz, 2014). Besides, Zin et al. (2011) and Taoual (2016) stated that the *Sukuk* market is now the most powerful part in Islamic finance and affirmed the role of Islamic bonds in promoting financial stability. Although some studies have begun to focus on *Sukuk* and financial stability, most of them were only been discussed theoretically to provide

understanding of those two topics from a basic perspective, such as development history, definitions and so on (Saeed & Salah, 2014; Rosengren, 2011; Zin et al., 2011; Alawode & Sadek, 2008).

Besides, the frequency and intensity of financial crisis have increased and threatened the stability of the financial system. Obviously, financial instability would have a negative impact on the real economy and consequently lead to macroeconomic instability (Morris, 2010). As for a nation, financial instability can lead to financial crisis and subsequently will destroy the whole economy. As for a company, financial stability ensures the company achieves uninterrupted growth, undisturbed in the event of shocks, and maintains financial liquidity and solvency (Pera, 2017; Bank Negara Malaysia, 2015b). More importantly, the financial stability of corporate sectors may affect the operation of the real economy and financial system's stability and thus influences the long-term development of the whole country (Cernavskis, 2014; Hernando & Martínez-Carrascal, 2008).

Furthermore, *Sukuk* provided one option for a company to issue fixed-yield securities, which at the same time follows *Sharia* Islamic law that prohibited uncertainty, interest and gambling. These unique properties of *Sukuk* allowed the issuers to access longer-termed funding at lower financing costs, and thus have attracted more domestic firms to tap into Malaysian *Sukuk* market to meet their financing needs (Bank Negara Malaysia, 2015a; Alhabshi, 2013). Meanwhile, Singh (2015) pointed out that debt management was seen as a key factor to achieve financial stability. As a substitute of conventional bond, *Sukuk* was also debt security. Thus, *Sukuk* could influence Malaysian firms' financing significantly via enhancing rationality of capital structure (Patuta & Pryshko, 2016; Haron & Ibrahim, 2012).

Therefore, the impact of *Sukuk* on the company's financial stability is worth exploring.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study is to investigate the relationship between characteristics of *Sukuk* and the financial stability of the Malaysian firms that issued it. Normally financial stability at firm level is measured by distance to default.

1.4.2 Specific Objectives

The specific objectives of this study include the following:

- i. To investigate the relationship between *Sukuk*'s intensity and firms' distance to default.
- ii. To determine whether tenure of *Sukuk* influence firms' distance to default.
- iii. To study the relationship between coupon rate of *Sukuk* and firms' distance to default.
- iv. To explore the role of *Sukuk*'s proportion to firms' distance to default, and
- v. To examine the influence of selected firms' financial parameters on firms' distance to default, such as, the firms' size, the valuation, the liquidity, the solvency and the profitability.

1.5 Significance of the Study

Initially, this study elaborates the theoretical knowledge of *Sukuk* and financial stability. It provides information such as the definition of *Sukuk* and financial stability, the development history of *Sukuk* and financial stability, the types of *Sukuk* and so on, providing a deeper understanding for readers who are interested in this topic.

Secondly, this study adds an additional empirical study for the relationship between *Sukuk* and financial stability at the firms' level, hence enriching the literature of the relevant topics, and provides an empirical basis for future studies in this topic.

Moreover, this study is conducted in Malaysia, thus the research results can provide some reference opinions for relevant Malaysian policymakers from various organizations. Further, it promotes the development of the *Sukuk* market so as to better grasp overall financial stability through policy incentives, reasonable supervision, correct guidance and so on. At the same time, it increases the visibility and influence of *Sukuk* among non-Islamic countries which would further strengthen and stabilize Malaysia's leading position in the field of Islamic finance.

Furthermore, this study conducted based on the listed companies in Malaysia. The results of this research provide some references to the company managers, which can help the company to participate more rationally in the *Sukuk* market, whether in issuing or investing in the *Sukuk* market. Besides, the rationality of the company's capital structure would be improved via the management of *Sukuk*. Which would further promote the firms' financial stability, and subsequently make sure the company's long-term efficient and sustainable development.

1.6 Organization of the Study

The remainder of the study is organized and presented into several chapters as discussed below.

The following chapter reviews the relevant studies on *Sukuk* and financial stability. Chapter 2 is divided into a few sections which include theoretical framework, empirical testing, and empirical evidence.

The methodology used in this study is discussed in Chapter 3. It is divided into a few subsections which include theoretical framework, data description, and empirical models.

Chapter 4 presents the empirical result and interpretation of the findings. Lastly, Chapter 5 covers the summary, conclusion and presents suggestions and recommendation for further studies.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Although *Sukuk* and Financial stability are two relatively new aspects for the contemporary financial market, their development is worthy of attention. *Sukuk* is usually referred to as Islamic bond for its similarities with the conventional bond, especially in terms of financial process (Mosaid & Boutti, 2014). As the pioneer of the *Sukuk* market, Malaysia holds the most structured market position and existed as early as the 1980s. Lower cost of funding, the flexible tenure and to reduce lead times of transaction are the main beneficial pushed for firms to issue *Sukuk* (Shahida & Sapiyi, 2013). Moreover, the attention given to financial stability is increasing considerably after the 2007-2008 global financial crisis. However, the definition or measurement of financial stability is quite complex due to the interdependence of the various elements within the financial system, and also due to the complex interactions among themselves and with the real economy at the same time (Gadanecz & Jayaram, 2008). Financial stability is a dynamic concept that changes over time, and it is in line with the multiple combinations of financing elements. Its huge function in economic promotion and enhancement, risk management and shock absorption make financial stability become an integral part of the modern financial world (Schinasi, 2004).

Literature review of previous studies relates to *Sukuk* and financial stability is presented in this chapter. It is divided into sections as follows: Section 2.2 discussed the empirical studies of financial stability; next, empirical studies of *Sukuk* is listed in Section 2.3; then Section 2.4 discussed the empirical models used in previous studies, and finally followed by the theoretical framework of this study which was discussed in Section 2.5.

2.2 Empirical Studies of Financial Stability

The relevant studies about financial stability conducted by previous scholars were the main focus of this subsection. The definition of financial stability of nations and firms were also deliberated in this subsection.

2.2.1 The Definition of Financial Stability

Financial stability has become a shining star among financial fields as well as in non-financial areas. All market participants, policy makers and academicians are trying to develop and to improve tools to promote and to measure financial stability. Although the phrase “financial stability” was first appeared in 1994, this field is still in the initial stage compared to price stability and monetary stability (Alawode & Sadek, 2008; Schinasi, 2005). The governor of the Swedish Central Bank pointed out that the concept of stability is ambiguous and not easy to define (Allen & Wood, 2006). Thus, it is difficult to define financial stability due to different explanations and opinions by different authors and researchers or institutions who were deliberating on it (Rosengren, 2011; Gadanecz & Jayaram, 2008; Cihak, 2007a).

More than twenty (20) years of development has led to numerous definitions of financial stability that exist; however, one thing should be noted is that there is no widely accepted and unique definition of financial stability (Rosengren, 2011; Morris, 2010; Alawode & Sadek, 2008; Yayla, Hekimoglu & Kutlukaya, 2008; Gadanecz & Jayaram, 2008; Cihak, 2007a). Based on the concept of financial stability in the Financial Stability Reports (FSRs) issued by the central bank of different countries, Cihak (2006) stated the analysis situation of financial stability is weaker compared to price stability, and this has caused by

the lack of a generally accepted measurement of financial stability or operational definition. Fortunately, most of financial stability followers were agreed with the basics that financial stability means there is no systematic failure, i.e., crisis, in the financial system. Furthermore, financial stability is also about the ability of financial system to withstand stress (World Bank, 2016; Cihak, 2006).

Simply speaking, as for a country level, financial stability is more concerned by the central bank and can be defined as one balance state (Bank Negara Malaysia, 2015b). As for a company level, financial stability can be simply defined as the solvency (Cernavskis, 2014; Pera, 2017). No matter which level it is, the majority existed definitions of financial stability can be categorized into two perspectives, namely, financial instability and financial stability directly (EPW Research Foundation, 2010; Alawode & Sadek, 2008). From the perspective of financial instability, financial stability is defined as the situation in which financial instability does not occur. From the perspective of financial stability, financial stability directly describes the situation of the overall financial market. The following is a sequential exposition of financial instability and financial stability in accordance with previous researches.

Based on asymmetric information problem and emphasized on the guiding role of the financial system in funds, Mishkin (1999) believed the most fundamental role of financial markets is to direct funds flow to individuals or firms with capital needs, while financial instability will occur when there is a shock interference happened on the information flow and thus causes financial system fails to transfer funds efficiently to individuals and companies with productive investment opportunities (Mishkin, 1999). Bank of Canada

(2003) defined financial instability as one kind of financial market state that hurt or potential to hurt the performance of the economy via their influence on the working of the financial system. Bank of Canada also stated out the various kind of instability and their harm on different financial as well as non-financial part correspondingly and then show different influence accordingly (Bank of Canada, 2003). Besides, Allen and Wood (2006) also pay their attention to financial stability via financial instability. The authors believe that financial instability involves multiple subjects, including individuals, families, companies and governments. Financial instability means that these subjects are suffering from the financial crisis, and such a crisis will have a negative impact on the overall macro economy (Allen & Wood, 2006). Therefore, from the definition of financial instability above, financial stability can be defined as those events against financial instability as a state in which financial instability events are unlikely to occur.

Meanwhile, some institutions tend to give a definition of financial stability directly. Central banks are more likely to provide specific guidance to their own countries about financial stability so as to maintain their own goal of financial stability. The Bank of England can be said to be the first to pay attention to financial stability; they described financial stability as “...*public trust and confidence in financial institutions, markets, infrastructure, and the system as a whole – is critical to a healthy, well-functioning economy*” (Bank of England, 2015). While European Central Bank (ECB) expressed financial stability as “*The condition in which the financial system – comprising financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances, thereby mitigating the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to*

profitable investment opportunities.” (European Central Bank, 2015). Besides, Bank Negara Malaysia (2015b) also show a positive sense about financial stability and defined it as “...*the condition where the financial intermediation process functions smoothly and there is confidence in the operation of key financial institutions and markets within the economy.*”

Besides, some scholars have also given definitions of financial stability in their research. Crockett (1996) contended that financial stability has existed when the main parts of the financial system are unchanging and function normally, and the main participants highly believed that the system can meet their needs successfully without any help. Schinasi (2004) proposed financial stability is the ability of the financial system. According to the author, financial stability occurs when the financial system can promote the economic performance and to solve financial imbalance caused by the system itself or major accidental and adverse event. The writer believed the accumulation of unbalances or weaknesses within the financial system or external shocks can lead to financial instability (Schinasi, 2004). Also, pay attention to the financial system itself, Rosengren (2011) stated financial stability reflects financial system could supply the required credit intermediation and payment services consistently in the real economy during its growth path.

The definition of financial stability at the company level is not common, only a few scholars mentioned in their research. From the perspective of financial instability, Allen and Wood (2006) believed that financial instability can be treated as a financial crisis. At the level of company, it means that the company is experiencing financial difficulties, the total expenditure is declining, and the unsuccessful investment projects need to be ended. From the perspective of financial stability, Cernavskis (2014) and Pera (2017) believed that the

financial stability of a company can be regarded as the solvency of the company. And a company's financial stability means the company has enough free cash flow to repay the company's debt, be it short-term or long-term debt. Furthermore, Pera (2017) clearly pointed out that the company's financial stability means the company can stick to its development goals in the presence of interference, and can resist the shock and return to the development path quickly.

2.2.2 Financial Stability of Nation/Country and Firm

Though the development of financial stability is relatively at an infant stage, the corresponding academic research has emerged with the increasing attention of financial stability. Different institutions or scholars try to study or measure financial stability from different angles.

Some scholars, such as McClintock (1996), Mishkin (1999), Shin (2009), Nachane (2010), and Cihak and Hesse (2010) focus their research direction on the relationship between financial stability and other financial related variables.

Focus on the link between financial derivatives markets and financial stability by using monetary theory of production that based on the data from 1987 to 1992, McClintock (1996) stated that appropriate intervention by the central bank can effectively avoid the spread of financial individual failure. Also, a super-national lending institution of last resort can supervise the derivative market at the supranational level and solve the risk caused by the derivatives market, thus effectively prevent systemic failure.

From the perspective of the banking system and financial instability, Mishkin (1999) pointed out that the most fundamental cause of financial instability is the incompleteness of government supervision over banking institutions. Deterioration of financial and nonfinancial sector balance sheets, rising interest rates and uncertainty would lead to asymmetric information, which would eventually lead to financial instability.

Based on the connection between securitization and financial stability, Shin (2009) used U.S. and UK as empirical evidence spanning from 1980 to 2008, as proof to point out that the risk tolerance of the shadow banking system (non-bank intermediaries that provide financial service similar to traditional commercial banks but not regulated) would be increased when the default probability of underlying assets declines, therewith, total credit supply offered to the ultimate users would increase. Thus, securitization can influence financial stability via the shadow banking system.

Based on a study of the relationship between capital management techniques and financial stability in India, Nachane (2010) stated that excessively pursuing complete liberalization of capital accounts in developing economies is undesirable, and rational control of capital inflows would decrease the vulnerability of economies effectively during financial turmoil. The author believed financial stability can be strengthened via capital management techniques, which include capital inflow/outflow control and prudent financial regulatory measures.

Paying attention to Islamic banks and financial stability, Cihak and Hesse (2010) chosen a cross country data with nineteen (19) countries from 1993 to 2004 to explore the

relationship between Islamic banks and financial stability. The study found that the size of a bank influences financial stability greatly. The results proved the smaller Islamic Banks tend to have stronger financial stability when compared with larger ones as the larger Islamic banks face more credit risk management challenges.

On the other hand, some institutions or researchers have tried to assess financial stability via various vulnerability indicators in the the financial system, like the ones conducted by International Monetary Fund (2017), Sundararajan et al. (2002), Gadanez and Jayaram (2008).

The International Monetary Fund (IMF) is one of the earliest organizations to focus on Financial Stability Indicators (FSIs). Since 1948, in order to support the macro-prudential analysis, and to assess the advantages and vulnerability of the financial system, the IMF and the international community developed FSIs. Today, this index covers more than two hundred (200) countries and about 32000-time series, including exchanges rates, main global and national economic indicators and so on (International Monetary Fund, 2017).

To confirm whether it is the main indicator of the banking sector's financial stability, Sundararajan et al. (2002) divided FSIs into core set and encouraged set. The intension is to be more comprehensive and flexible when comes to periodic monitoring of financial stability. The core set contains main indicators of the banking sector namely indicators of banks' capital adequacy, asset quality, earnings and profitability, liquidity, and sensitivity to market risk. The encouraged set includes indicators of the additional banking sector, indicators of the corporate sector, non-bank financial institutions, real estate market, households and

market liquidity. For further examples, capital to assets, real estate prices, household debt to Gross Domestic Product (GDP), an asset to GDP and so on are some indicators specimen in encouraged set.

Gadanecz and Jayaram (2008) believed that six (6) main sectors, namely, real economy sector, corporate sector, household sector, external sector, financial sector and financial market sector need to be checked in order to measure financial stability. Different sectors have different indicators to measure their financial stability, and every sector has three (3) indicators at least. For example, inflation for real economy sector, total debt to equity for corporate, household debt for household sector, real exchange rate for external sector, the real interest rate for the financial sector and the market liquidity for the financial market sector.

In addition, some followers of financial stability prefer to choose a proxy as a simple measure of financial stability or develop an aggregate index to measure financial stability, such as the method employed by Boyd and Runkle (1993), Illing and Liu (2006), Cihak (2007b), Xu and Wen (2010), and Morris (2010).

As one of the major players in the financial stability system, the banking sector is often being studied. A common measurement of risk for individual bank is the Z-score of the bank (Cihak & Hesse, 2010; Xu & Wen, 2010; Boyd & Runkle, 1993). The Z-score is chosen as a proxy of financial stability for individual banks because this ratio is related to the bankruptcy probability directly. In formula form, Z-score can be written as $Z \equiv (k + \mu) / \sigma$, where k means how many percent of equity capital over assets, μ means how many

percent of average return over assets, and σ means the standard derivation of the return on assets as an indicator of return volatility. The higher value of the Z-score means the lower the probability of bankruptcy and the better the financial stability.

Illing and Liu (2006) built a single measurement for financial stability called financial stress index (FSI) focusing on Canadian financial system during 1977-2006. This index was created as a variables' weighted average which is built via weights the specific market size to its relative share in the real economy. The extreme values of the index indicate financial crises.

Cihak (2007b) developed the distribution of systemic loss as a measurement of financial stability based on daily equity price of the bank over the period of 1990 to 2004 in twenty-nine (29) developed countries and emerging markets. This measurement includes the full distribution of systemic loss and built from individual defaults to systemic loss. This systemic loss approach combines three key elements, namely, the default probability of each individual financial institution, loss given default of the institutions, and correlation of defaults across the institutions as for their interconnectedness.

Morris (2010) proposed a single comprehensive financial stability index to measure and to forecast financial stability. Based on the previous work, and using quarterly data of banking sector from 1997 to 2010 of Jamaica, this Aggregate Financial Stability Index (AFSI) combines microeconomic, macroeconomic and international factors that reflect the performance of banking sector into a single financial stability indicator. The result from this study successfully supported that AFSI to reflect the banking sector's performance of Jamaica effectively during the selected period.

Brave and Butters (2011) build two new indexes to assess financial stability which are Financial Conditions Index (FCI) and Adjust FCI via principal component analysis based on the expectation-maximization algorithm. One hundred financial indicators were selected from America and divided them into three sections: money market, debt and equity market, and banking system. The two indexes are efficiently used to understanding and quantify the relationship exists between traditional and evolving financial markets and the way they affected the economic conditions. The results of this paper provided evidence that FCI and Adjust FCI are two useful tools for measuring financial stability, as they are good reflection of major events in the U.S., such as financial history and the interdependence of financial and economic conditions.

Lemus-Esquivel, Quicazán-Moreno, Hurtado-Guarin and Lizardo-Cuéllar (2015) provided a single indicator to measure the financial soundness of the private corporate sector. This indicator was constructed via principal component analysis on the basis of learning 35 kinds of financial ratios come from Colombian start from 2000 to 2013. Those ratios cover firms' efficiency, leverage, profitability, liquidity, and size part.

From the studies shown above, it is clearly seen that financial stability is more at the macro level, but research on financial stability at the company level still exists, although the number is relatively rare, such as the research done by Vovchenko, Holina, Orobinskiy and Sichev (2017), Lace and Sundukova (2010), Skribans (2009), Cernavskis (2014), Pera (2017), World Bank (2016), and Bharath and Shumway (2008),.

Based on Russian companies, from a perspective of qualitative analysis, Vovchenko, Holina, Orobinskiy and Sichev (2017) believed an easy-to-understand, highly operational risk management instruments were essential for Russian companies to maintain financial stability. The authors stated an experience, knowledgeable and competent risk manager should be introduced in order to provides efficiently and professionally control of corporate risk from within the company, which would reduce many corporate risks and strengthen business performance. Besides, a top-down integrated risk management system should be formed, in addition to the risk managers, the heads of all departments should also participate in the risk management system.

According to Lace and Sundukova (2010), financial stability is important for the development of every company and can be treated as solvency in a long period. Using quantitative analysis and focused on financial indicators of companies in six different industries in Latvia from 2002 to 2007, the authors found that the company's financial stability was significantly related to its financial resources and capital structure, and especially linked with the balance of long-term and short-term asset. Besides, the authors pointed out a financial stabile company's long-term capital should not be lower than the sum of the liquid asset, and those liquid assets should be financed at the expense of owner equity and long-term liabilities.

Skribans (2009) estimated the financial stability of the company based on eight companies chosen from the building industry of Latvian. Ratios of liquidity, profitability, solvency and activity of the company were elected to measure the company's financial stability. The results suggested that the company whom used their own funds tend to have

better financial stability, and the larger the company, the higher size of the company's financial stability.

Atkeson, Eisfeldt and Weill (2017) defined “distance to insolvency” as the firm's leverage adjusted to the asset volatility, or business risk. They proposed this simple ratio as a measurement of the financial soundness of publicly traded firms in the United States (U.S.) from 1926 to 2012. This study discovers that the variation in asset volatility is the main power to push the change of firm's financial soundness, especially in 2008. Besides, the financial stability of large U.S. financial companies was roughly similar to that of large non-financial companies from 1926 to 2007.

Orazalin, Mahmood and Narbaev (2019) concentrate on firms' financial stability based on forty-five (45) largest listed companies of oil and gas industry in Russian from 2012 to 2016. Panel data related to sustainability performance and firm specific characteristics was chosen, and Z-score worked as the measurement of firm's financial stability. The result indicates that the specific characteristics of company, such as company's financial capacity, leverage, size, and age were important factors affecting firm's financial stability.

From the perspective of qualitative analysis, Cernavskis (2014) and Pera (2017) believed that financial stability of the company is inseparable from the long-term stable development of the company, and can be regarded as solvency of the company. Hence, a company can be treated as financial stability if the company has sufficient cash flow available any time to repay the company's various debt.

The World Bank explained the financial stability in detail in the background section of the Global Financial Development Report 2015/2016: Long Term-Finance. It stated that the common approaches used to measure firm-level stability were the Z-score and Merton model. The Z-score is often used to measure the solvency risk of a bank, and Merton's model, also known as the asset value model, is usually used for the default risk of a corporate. Besides, the Merton model is easy to be modified. For instance, Moody's KMV model and Distance to Default (DD) are developed based on the Merton model (World Bank, 2016).

Bharath and Shumway (2008) examined the precision and the contribution of the Merton DD model in predicting the company's default risk via numbers of empirical analysis. All firms of the Compustat Industrial file exclude the financial firms and 1449 default firm from Altman default database and Moody's website over the period of 1980 to 2003 are the study's sample. The empirical result indicated that the Merton DD model is a useful tool for forecasting company's default, and the equation form of Merton DD model can provide useful guidance for future researchers to construct a new default predictive model.

2.3 Empirical Studies of *Sukuk*

The definition of *Sukuk*, the types and structures of *Sukuk*, and studies related to *Sukuk* are elaborated in this subsection.

2.3.1 The Definition of *Sukuk*

The term of *Sukuk* can be dated back to the middle Ages among the Muslim societies, and it is a plural form originated from the Arabic word "*sakk*" which means "certificate", "certificate of property" or "order of payment" (Alshamrani, 2014; Saeed & Salah, 2014; Saripudin, Mohamad, Razif, Abdullah & Rahman, 2012).

In February 1998, one of the early *Sukuk* definitions in the modern era was given by the Council of the Islamic *Fiqh* Academy during the fourth session which was held in Jeddah. The Council defined *Sukuk* in Resolution No. 30(5/4) as follows (Saeed & Salah, 2014):

“...investment instruments which allocate the [muqarada] capital ([Mudaraba]) by floating certificates, as an evidence of capital ownership, on the basis of shares of equal value, registered in the name of the owner; as joint owners of shares in the venture capital or whatever shape it may take, in proportion to...each one’s share therein.”

This is the first clear definition of *Sukuk* in modern times, although it focuses more on *Muqarada Sukuk*. *Muqarada Sukuk* is a type of *Sukuk* which is a fund or partnership contract based on equity. One party involved provided capital and another party provided expertise, energy and time to manage that capital.

Saeed and Salah (2014) stated that *Sukuk* was formally defined by Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) in Section 2 of the *Sharia* Standard No. 17 for the first time:

“Certificates of equal value representing undivided shares in ownership of tangible assets, usufructs and services or (in the ownership of) the assets of particular projects or special investment activity.”

Besides, the Malaysian International Islamic Finance Centre (MIFC) (2015b) mentioned *Sukuk* as a kind of trust certificates or a kind of participation securities used by

financial institutions to raise money, and to give investors the right to own part or all of the underlying assets as well as the commensurate cash flow and risk included.

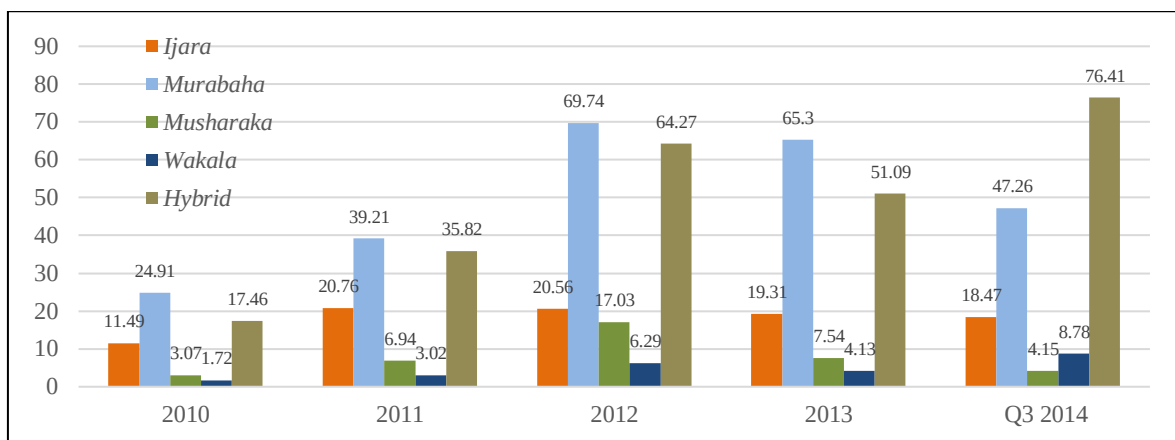
“...refers to certificates of equal value which evidence undivided ownership or investment in the assets using Sharia principles and concepts endorsed by the Sharia Advisory Council (SAC).” (Malaysian International Islamic Finance Centre, 2015b)

Furthermore, some scholars show their views about *Sukuk* in their studies as well. Based on an acceptable Islamic financial contract, Zaidi (2008) stated that *Sukuk* are certificates that follow *Sharia* principle in financial sense and represent a pass-through mechanism whereby asset trusts issued to investors. While in the opinion of Alshamrani (2014), *Sukuk* refers to a paper which carries out financial obligations for trade and other commercial actions. According to Yean (2009), *Sukuk* were documents or certificates that denote ownership in an asset. Besides, according to Hanefah et al. (2013), *Sukuk* were treated as certificates of equal value that represent an ownership interest in tangible assets. In simple terms, *Sukuk* is said to be trust certificates by Oladunjoye (2014).

2.3.2 Types of *Sukuk*

A number of different *Sukuk* types that have been structured based on a different mode of financing and Islamic trades. Fourteen (14) different types of *Sukuk* structures were established on the basis of Islamic financial contract and are acceptable in the AAOIFI *Sharia* standard 17 “investment *Sukuk*” (Saeed & Salah, 2014; Hanefah et al., 2013; Infosys, 2012). AAOIFI (2014) and Infosys (2012) pointed out that the most common types of *Sukuk* are *Mudaraba*, *Musharaka*, *Murabaha*, *Ijara*, *Salam*, *Istisna* and Hybrid *Sukuk*. In addition,

Oladunjoye (2014) believed that *Murabaha* and *Ijara* are the most popular *Sukuk* structures based on the issuance and the number of issuers in 2012. Furthermore, Franklin Templeton Investments (2014) stated that the most popular type of *Sukuk* are *Musharaka*, *Murabaha* and *Ijara* based on the issuance volume. According to Thomson Reuters (2015), Figure 2.1 depicts the trend of global *Sukuk* based on five (5) different structures from 2010 to the third quarter of 2014, which are *Musharaka*, *Murabaha*, *Ijara*, *Wakala* and Hybrid.



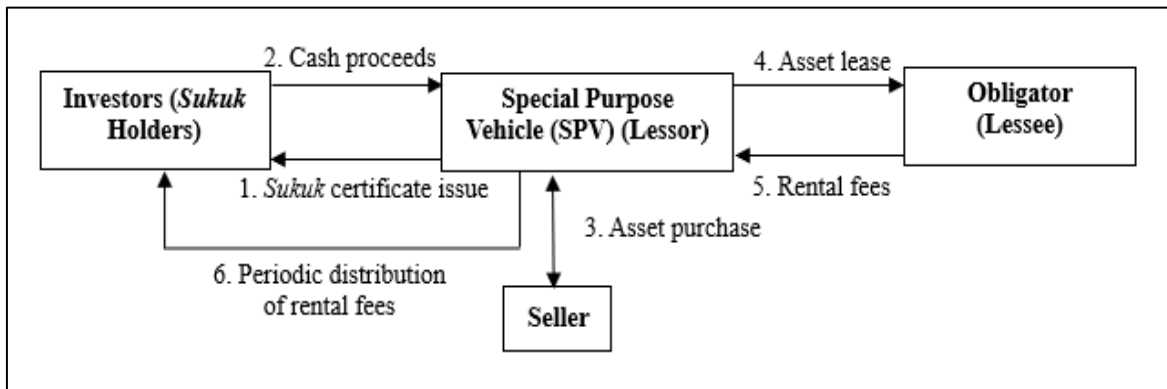
Source: Thomson Reuters (2015)

Figure 2.1: Global *Sukuk* Structure Trend from 2010 to 3rd Quarter 2014 (billions of USD)

i) *Sukuk al Ijara* (Lease-based *Sukuk*)

Ijara means “to give something on rent” as an Islamic term “*Fiqh*”, and it is analogous to an English term “leasing” which means “transfer the usufruct of a particular property to another person in exchange for a rent claimed from him”. When *Ijara* is used as an investment form and a financing model in Islamic finance activities, *Sukuk al Ijara* is a financial rental or lease arrangement that is constructed based on *Ijara* contract which involves sale and lease-back of the underlying assets, such as real estate, ships, aircraft and other tangible assets. The issuer of *Ijara Sukuk* buys an investment item in accordance with customer requirement and then leases it back for a specified period. One thing that needs to

keep in mind is that the ownership of the asset is still held by the transferor, the only usufruct is transferred during those periods. *Sukuk al Ijara* can give its holders a fixed income flow and it is a popular and well-known structure for a simple structure to a freely tradable asset (Usmani, 2002). *Sukuk al Ijara* usually starts when a party needs financing or an asset but without enough money in hand. Figure 2.2 shows simply steps for *Sukuk al Ijara* structured.



Source: Jamaldeen (2012)

Figure 2.2: The Structure of *Sukuk al Ijara*

Special Purpose Vehicle (SPV), a separate legal entity with the goal to facilitate the transaction happened during *Sukuk* period, is established by obligator who needs asset or financing. Once SPV established successfully, it will purchase the certain assets as required by obligator with an agreed predetermined purchase price. Firstly, the SPV will issues *Sukuk* certificates to investors who are looking for *Sharia* compliant securities to get enough money to purchase the specified assets. Then, investors subscribe to the *Sukuk* and pay the proceeds to SPV. Later, using investors' proceeds, the certain asset will be purchased by SPV. After this, as a lessor part, SPV will lease the required asset to the obligator for a fixed period based on a lease contract which is established between SPV and obligator. Consequently, as the user of the underlying asset, the obligator will pay periodic rentals fees to the SPV as a

lessee. According to the *Sukuk* payment schedule, the SPV will distribute these rental fees as a periodic return to the *Sukuk* holders who are beneficial owners of the underlying asset (Saeed & Salah, 2014; Jamaldeen, 2012).

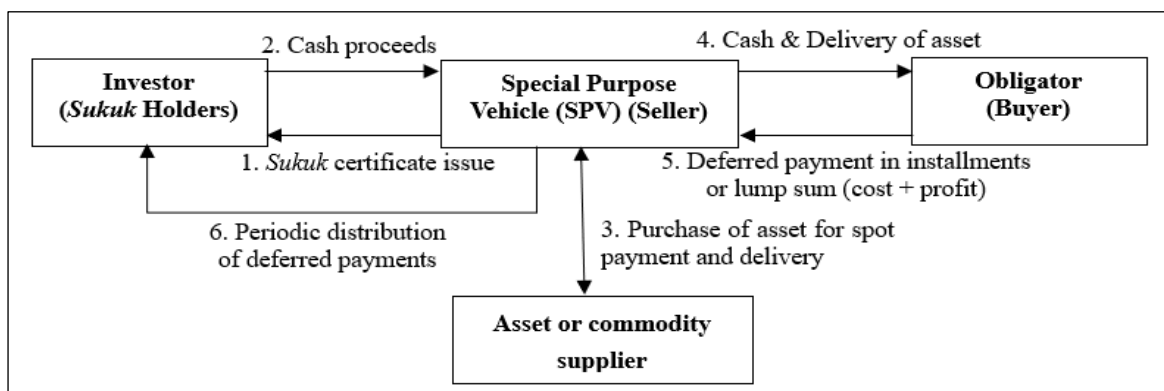
The cash flow from obligator to SPV is treated as rental fees, and the periodic payment from SPV to investors will continue until the maturity date of *Sukuk*. When the maturity date reached, the obligator will purchase back the underlying asset from SPV at the predetermined value, and becomes the legal owner of the underlying asset. The price to buy back the underlying asset is equal to the initial purchase price and the principal amount of the *Sukuk*. Thus, the SPV can use this money to pay the principal amount back to the investors, and finally the *Sukuk* certificates will be redeemed with this money (Saeed & Salah, 2014).

ii) *Sukuk al Murabaha* (Cost plus or deferred payment *Sukuk*)

According to Islamic *Fiqh*, the original meaning of *Murabaha* is a sale. The special part of *Sukuk* is that the seller needs to disclose the actual cost happened in acquiring the specific asset and the profit added thereon (Usmani, 2002). *Sukuk al Murabaha* is popularly used as an Islamic mode of financing by most Islamic banks and financial institutions. It was formed on the basis of *Murabaha* contract which is an agreement to delivery an asset now between obligator (seller) and investor (buyer). The price of the *Murabaha* is the total cost of obtaining the specified asset plus the profit agreed by both parties in advance. The payment of *Murabaha* can be paid on the spot, or in installment on a follow-up date, or in a lump sum in the future, as agreed by both parties (Oladunjoye, 2014; Jamaldeen, 2012).

Sukuk al Murabaha is transferable only at face value and gives its investors the advantage to purchase or invest in the form of the loan without bearing interest. However, *Sukuk al Murabaha* is not so popular among investors who are seeking *Sharia* compliance because it represents that the obligator (buyer) owes money to the investor (seller) which means debt exist in this contract, while sale or trade in debt is prohibition by *Sharia* in the secondary *Sukuk* markets (Franklin Templeton Investment, 2014; Jamaldeen, 2012). In order to improve the negotiability of *Murabaha Sukuk*, some *Sharia* scholars agree to issue *Murabaha Sukuk* in the mixed portfolio as negotiable certificates and tradable on the secondary market, with condition that the mixed portfolio includes more than 50 percent of fixed assets or tied to *Ijara* contracts (Jamaldeen, 2012).

Special purpose vehicle (SPV) also required when *Murabaha Sukuk* formed, and it is used to facilitate the transaction between the investor and the obligator too. Same with *Ijara Sukuk*, *Murabaha* contract also begins with the obligator who needs an asset but without enough money. Once the cost-plus and deferred payments purchase agreement is signed between the SPV and the obligator, the *Sukuk al Murabaha* will work as in Figure 2.3.



Source: Jamaldeen (2012)

Figure 2.3: The Structure of *Sukuk al Murabaha*

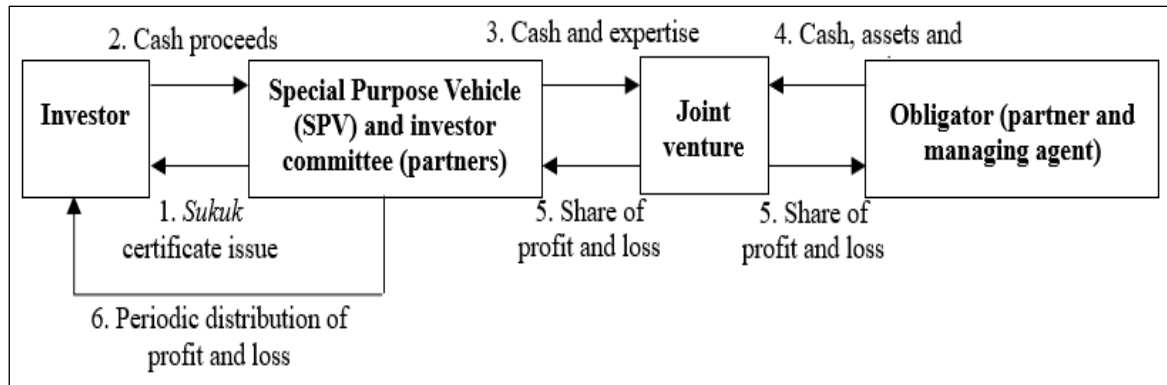
Firstly, SPV issue *Sukuk* certificate to investor to get the cash proceeds to purchase the specified asset required by obligator. The investor subscribes *Sukuk* and that cash proceeds to flow from the investor to SPV simultaneously. Therewith, the SPV purchases an asset for spot payment from an asset supplier and sells it to the obligator based on cost plus profit margin according to the agreement signed. The delivery of the asset from SPV to obligator is spot while the payment from obligator to SPV is deferred in installments or lump sum in the future agreed days. Then SPV distributes the deferred payment to investors periodically (Jamaldeen, 2012).

iii) *Sukuk al Musharaka* (joint venture *Sukuk*)

Musharaka is derived from an Arabic word “*Shirkah*” which means sharing literally and also means partnership in the context of business and trade. *Sukuk al Musharaka* supports a joint venture business activity in which all partners contribute capital, labor and expertise in it. And the profit is shared among all parties based on agreed-upon rations or declining basis, while the losses is shared according to the proportion contributed capital in the joint venture (Franklin Templeton Investment, 2014; Usmani, 2002). *Sukuk al Musharaka* can be divided into two categories, namely *Shirkat-ul-milk* and *Shirkat-ul-'aqd*.

Shirkat-ul-milk means joint ownership of two or more persons in a particular asset and the profit division is based on the ratio of shares. It is formed by the parties' own option on non-profit principles or comes into existence automatically via property inherited without any action taken by the parties involved. While *Shirkat-ul-'aqd* means a partnership based on a contractual offer and acceptance relationship affected by a mutual contract in business and the profit division is on the basis of capital contributed. And it is formed with the intention to generate profit generally (Al-Amine, 2008; Usmani, 2002).

Sukuk al Musharaka starts when the obligator and SPV signed an agreement which specifies the ratio of profit sharing and indicates that the obligator will transfer the underlying assets to the joint venture. Thereafter, the following steps of *Musharaka Sukuk* will follow as Figure 2.4.



Source: Jamaldeen (2012)

Figure 2.4: The Structure of *Sukuk al Musharaka*

Firstly, *Sukuk* certificates were issued from SPV to the investors. Subsequently, the investors subscribe to the *Sukuk* and pay the proceeds to SPV at the same time. Then SPV will transfer the proceeds to the joint venture, and the investor committee will provide its expertise. Eventually, the obligator will work as a partner and managing agent and contribute cash and/or assets and expertise to the joint venture as well. After a period of time, the joint venture will produce profit or loss based on some investment activities, and then the profit and loss will have shared between SPV and obligator according to the agreement contract. Once the joint ventures bring profit, the SPV will distribute profit to *Sukuk* holders using the sharing profit from joint venture periodically on the basis of the contract. Unlike *Sukuk* based on *Murabaha* contract, *Musharaka al Sukuk* can be traded on the secondary market (Jamaldeen, 2012).

iv) Other Types of *Sukuk*

Besides the above *Sukuk* structures, there are some other popular Islamic contracts, such as *Mudaraba*, *Salam*, *Istisna* and so on.

Sukuk al Mudaraba is another kind of *Sukuk* which is based on equity partnership. One party involved in this *Sukuk* is to provide capital only called *rabb-ul-mal*, while another related party just provides expertise, energy and time as the working partner called *mudarib*. The profit produce from the investment activities is distributed among those two parties based on pre-agreed agreement signed. Once there are losses, they will solely have borne by *rabb-ul-mal* and the loss to *mudarib* is the time and energy devoted to the investment activities (Jamaldeen, 2012; Usmani, 2002).

Sukuk al Salam is one kind of purchase with deferred delivery, and the meaning of *Salam* is the sale. This *Sukuk* give the seller the advantage to get the payment fully in advance but deliver the appointed item on a future date. *Salam Sukuk* start with the contract signed by SPV and obligator (seller) to state that SPV will buy the asset from obligator for spot payment but deferred delivery. During the process of *Salam Sukuk*, a separate underwriter appoints by SPV or obligator itself is required to work as an agent to sell the future specific asset for cost-plus to the buyer. Usually, *Salam Sukuk* is widely used by a company to meet its short-term liquidity needs (Jamaldeen, 2012).

Sukuk al Istisna is an Islamic project bond, also means sale. It is formed on the basis of a contract signed by a buyer and a manufacturer to indicate that the manufacturer will finish a required construction project on a future date. The items in *Istisna Sukuk* are always needed

in manufacturing. Besides, the payment does not need to pay fully in advance but the time of payment, and the price of the item is necessary to be known by the parties involved. Generally, *Istisna Sukuk* is a better choice to manufacturer under a large infrastructure project (Alshamrani, 2014; Franklin Templeton Investment, 2014; Jamaldeen, 2012; Usmani, 2002).

2.3.3 Studies Related to *Sukuk*

Same with financial stability, as one of the hot topics, *Sukuk* also attracted the attention of many scholars. The term *Sukuk* can be traced back to the middle ages among Muslim societies. *Sukuk* are plural form originated from the Arabic word “sakk” which means “certificate”, “certificate of property” or “order of payment”. *Sukuk* was asset-backed financing method complied with *Sharia*, and usually known as Islamic bond in today’s financial activities (Alshamrani, 2014; Saeed & Salah, 2014; Franklin Templeton Investments, 2014; Hanefah et al., 2013; Rezaei, 2013; Saripudin et al., 2012; Ali, 2011; Usmani, 2002). Although *Sukuk* market is a promising segment of Islamic finance and the development of *Sukuk* is increasing considerably in last decade, most of the existing literature on *Sukuk* is descriptive and anecdotal, while the empirical analysis is quite sparse (Smaoui & Nechi, 2017).

By using the cash flow chart, studies done by Wilson (2008), Dusuki (2010), Ali (2011), Saeed and Salah (2014) and Alshamrani (2014) were able to introduce the common structures in detail about *Sukuk*, such as *al-Ijara*, *al-Mudaraba*, *al-Murabaha*, *al-Musharaka*, *al-Salam*, *al-Istisna* and so on. No matter which *Sukuk* structures will be used in real economy activities, Special Purpose Vehicle (SPV) is meaningful to the success of *Sukuk* issuance and management.

Based on global view and accounting standard of *Sukuk*, Hanefah et al. (2013) stressed that there are not many differences between AAOIFI standard on investment and International Financial Reporting Standards (IFRS) for financial instruments via comparative analysis. The result from this study suggests that the unique feature of Islamic financial instruments must be considered when the new accounting standards developed. The authors also appeal to establish a harmonized *Sharia* ruling globally so as to improve the transparency of industry and to enhance the confidence of the investors. From the legal and governance perspectives, Alhabshi (2013) summarizes five successful development experiences of *Sukuk* in Malaysian, which are, the goal of all actions toward success, to provide the fundamental legal framework, well-founded enforcement, to remain transparent, and timely distribution of welfare.

Same with conventional bond or stock, *Sukuk* are instruments used for financing to meet the capital requirements of companies to achieve development. Alhabshi (2013) stated that one of the main motives for Malaysia to developing Islamic Capital Market (ICM) is avoiding *riba*, namely, interest. Usmani (2008) pointed out four main benefits of *Sukuk*. Firstly, *Sukuk* have definitely more advantage of financing large enterprises compared with small ones. Secondly, *Sukuk* gives their investors an ideal means to deploy capital stream, and investors can require whole or part thereof cash from their investment once they are needed. Thirdly, *Sukuk* provides an excellent way for banks and Islamic financial institutions to manage liquidity. Lastly, *Sukuk* allows their investor the right to benefit the equitable distribution of true profit from the underlying assets.

Past empirical studies about *Sukuk* were conducted by comparing *Sukuk* and conventional bond. Using 79 listed firms on Bursa Malaysia from 2001 to 2010, studies done by Shahida and Sapiyi (2013) proved that firm sizes, past *Sukuk* issuance experience and tax incentives are the main reasons for a firm to issue *Sukuk* over conventional bonds in Malaysia. An initial attempt was done by Mohamed, Masih and Bacha (2015) to find out the motivation of firms issuing *Sukuk* or conventional bonds from 2000 to 2012 in Malaysia. The empirical results show that firms prefer to issue *Sukuk* if they are facing a higher information asymmetry cost. In addition, compared with straight bond, firms with higher growth opportunities prefer to choose exchange-based *Sukuk* as the way of fund-raising. In terms of the impact of conventional bonds and *Sukuk* announcement on shareholder wealth, Ashhari, Chun and Nassir (2009) studied the firms list in Bursa Malaysia from 2001 to 2006 via an event study. The result showed the announcement of *Sukuk* issuance has wealth effect while there is none on the conventional bond announcement. More precise research was done by Alam, Hassan and Haque (2013), where a negative relationship exists between the *Sukuk* announcements and market reaction before and during financial crisis happened in 2007 and 2008, meanwhile positive influence exists between the conventional bond announcements and market reaction before the crisis but had showed negative influence during and after crisis period. Besides, this study also found that the size of the bond offering is negative for cumulative abnormal return of *Sukuk* but positive for the conventional bond.

Wealth effect of *Sukuk* issuance has been tested by Ibrahim and Minai (2009) according to an event study in Malaysia, and found that a positive correlation exists between wealth effect of the *Sukuk* issuance announcement and the investment opportunity of the issuer, while a negative correlation between issues' size, firm size and whether the announcement

was accompanied by Security Commission approval. Furthermore, this study believed the information disclosure level of listed companies issuing *Sukuk* is low.

Haron and Ibrahim (2012) examined the impact of *Sukuk* on corporate financing from 2000 to 2009 via 790 firms in Malaysia. With the chosen thirteen explanatory variables from firm and country specifically, this empirical study links Islamic finance with corporate finance, and the result determines the development of *Sukuk* market has a significant impact on the capital structure of target company in Malaysia.

From the perspective of macroeconomics, Said and Grassa (2013) conducted their work on the factors influence *Sukuk* market development based on 10 countries from 2003 to 2010. The empirical analysis showed that economic size, trade openness, percentage of Muslims, GDP per capital and *Sharia* Law are positively related to *Sukuk* market development, while financial crisis showed a significant but negative relationship with *Sukuk* development. In addition, this study also points out that the bond market is complemented rather than substitutes of *Sukuk* market as for bond market gives significant and positive influence on the development of the *Sukuk* market.

Focus on seven member countries of Organization of Islamic Conference (OIC) which issued *Sukuk* in domestic currencies from 1970 to 2010, Ahmad and Muda (2013) appraised the influence of exchange rate pass-through for those countries. Results indicated that import and consumer prices pass-through gave positive function in the long horizon of Bahrain and Saudi Arabia and ensured the two counties protected themselves from external shocks. Besides, authors believed stability and flexibility of the exchange rate system are of great significance for strengthening cross-border *Sukuk* issuance.

Using *Sukuk* indices, bonds indices and market indices, Mosaid and Boutti (2014) comparing the performance of portfolios consist with *Sukuk* and bond respectively from 2007 to 2012 in Malaysian, the authors believed *Sukuk* indices outperformed bonds and market indices. Positive and significant relationship exists between *Sukuk* and bonds portfolio.

From the perspective of portfolio diversification, Najeeb, Bacha and Masih (2017) investigated the influence of held-to-maturity strategy to effective portfolio diversification based on Malaysia and Gulf Corporation Countries (GCC) *Sukuk* market from 2010 to 2013. Their finding indicates that a hold-to-maturity strategy can facilitate portfolio diversification when this *Sukuk* portfolio is made up of local currency denominated, while hold-to-maturity strategy can hinder portfolio diversification if *Sukuk* portfolio is composed of international currency.

Smaoui and Nechi (2017) link *Sukuk* markets and economic growth together via a dynamic panel model. Data comes from 18 *Sukuk* issuing countries from 1995 to 2015 shows that the developments of the *Sukuk* markets, both sovereign and corporate *Sukuk* have strongly promoted the long-term economic growth via the volume and intensity of *Sukuk*. In addition, authors believed *Sukuk* markets have strong appeal for those who are not interested in interest-based bonds, thus can encourage financial inclusion and thereby the investment as well as economic growth.

Every coin has two sides, *Sukuk* also share risk as an investment instrument. Rezaei (2013) stated *Sukuk* holders mainly need to face asset loss risk, interest rate risk and decline

in asset price risk. Chosen *Sukuk* defaulters in Malaysia from 2000 to 2010, Kamarudin, Kamaluddin, Manan and Ghani (2014) found default is mainly because of issuers' credit-worthiness. And *Sukuk* size also gives a positive influence on chosen *Sukuk* default instances. Furthermore, the occurrence of financial ratio and current ratio problems can also lead to *Sukuk* defaults.

In order to meet the demand in the real economy, some innovations were done about *Sukuk* structure. These innovations improve the negotiability of *Sukuk* but also have generated some *Sharia* legal issuers and economic controversial issues at the same time.

Focusing on sovereign *Sukuk* of Saudi Arabia and Malaysia, Wilson (2008) examined *Murabahah Sukuk* and *Ijara Sukuk*. The results showed that it created greater payment stability if using GDP-based pricing benchmarks in Saudi Arabia, but not for Malaysia. Using a case study of Kuala Lumpur Sentral Sdn. Bhd. (KLSSB), Saripudin et al. (2012) conducted a study based on *Musharaka Sukuk* in Malaysia to confirm whether *Sukuk Musharaka* issued by KLSSB has satisfied the principles and conditions under *Musharaka* contract. On the basis of *Musharaka* and *Ijara* structure *Sukuk*, Al-amine (2008) appeal for closer cooperation among financial experts and *Sharia* scholars as well as more interaction among *Sharia* boards. Another study that done by Yean (2009) also suggested *Sharia* scholars should have more discussions or sessions of a meeting based on the controversies surrounding *Sukuk* with the hope of coming out with globally acceptable standards and practices.

2.4 Empirical Studies on Bond/*Sukuk* and Financial Stability

The volatility of financial markets and the desire for stability linked bond market and financial stability closely. Attention has grown on bond/*Sukuk* and financial stability from different perspectives by policymakers, market participants and academicians.

Zin et al. (2011) confirmed the development of *Sukuk* market was successful and gained an impressive achievement. The author pointed out the development of the *Sukuk* market can promote financial stability as for *Sukuk* could participate in international market and could generate important cross-border capital flows that could be realized outside the domestic market. In its infancy, the government was the main player in the *Sukuk* market. As demand for long-term financing grows, the private sector has become an integral part of the *Sukuk* market. The authors stated that in this highly competitive environment, the depth and liquidity of the *Sukuk* market, as well as the huge role that *Sukuk* market can enable large cross-border flows of money outside the domestic market are conducive to promoting global economic growth and financial stability.

Taoual (2016) comprehensively studied and analysed the development of *Sukuk* market in the Gulf Corporation Countries (GCC) from the following five aspects: 1) the maturity of *Sukuk*, treated as short term if the maturity less than 12 months; 2) the issuance currencies of *Sukuk*, divided into domestics and international markets based on whether it was issued in local currencies; 3) the industry distribution of *Sukuk* issuer, which included basic materials, government, consumer prod, industrial, financial, and oil/gas/electricity industry; 4) the structure and potential risk of *Sukuk*, which contained *Mudarabah*, *Musharakah*, *Murabahah*, *Ijarah*, and *Hybird Sukuk*; and 5) the Islamic securitization by basic collateral

of *Sukuk*, which included residential mortgages, trade receivables, property lease receivable, and lease receivables. The finding proved that *Sukuk* can indeed achieve the effective contribution to the financial stability of GCC. Besides, this study suggested under the premise of observing *Sharia* principles, pay attention to the ownership, risk sharing, transparency and moral financing of Islamic finance principles would enhance the development of *Sukuk*.

Davis and Stone (2004) pointed out that the bond market is still very active after the financial crisis and the issue amount is increased. Using the chosen existing fund flow and balance sheet data from industrial counties as well as emerging market economies (EMEs) spanning 1970 to 1999, they checked the relationship between the bond market and financial crisis. And the result proved that the bond market can well mitigate the negative impact of the financial crisis on corporate finance. Besides, the authors stated when studying the economic response to the crisis, not only the banking sector should be considered, but also the corporate sector.

Focus on the relationship between local currency bond market development and financial stability among Latin American countries, Jeanneau and Tovar (2008) pointed out the huge development of domestic bond markets in those countries was great significance for financial stability. They stated the local currency bond market can reduce instability of system which is caused by currency and maturity mismatches, thus ensuring the stability of domestic financial intermediaries.

From a global perspective, Burger, Warnock and Warnock (2009) also supported the saying of development of local currency debt market in emerging economies is a good manner to promote global financial stability during the crisis period. This is because local debt markets are good at reducing the dependence on foreign currency debt and so there will be fewer currency mismatches. In addition, this market is momentous for broader financial development goals and this broader development can promote economic growth and hence reduce poverty, what more is that the local currency bond market can reduce the lack of sound and liquid financial assets globally.

Also focused on local currency bond market, Park, Shin and Tian (2018) investigated the relationship between local currency bond market and financial vulnerability during financial stress. The exchange rate depreciation was chosen as the proxy of financial vulnerability and the result proved that the local currency bond market can mitigating external shocks, protecting the financial system, and thus promoting financial stability of developing countries.

Zarate, Melo-Becerra and Ramos (2015) observed the bank sector in Colombian from 2003 to 2013 to find the causal relationship between public debt market and financial stability by using directed acyclic graphs and structural vector auto regression. They have shown that the change in inflation, policy interest rate as well as the indicators of risk perception can affect the public bond market strongly, and consequently influence financial stability. Their study proved the development of bond market can promote financial stability.

In view of nine Asian countries spanning from 1997 to 2009, Hmida and Brahmi (2016) pointed out the development of domestic bond markets is positive related to financial stability significantly. This study also believed that by reducing double misalignment of maturity and currency, the quality of bank asset can be improved and thus promote the positive impact of bond market development. In addition, the authors stated the development of domestic long-term and liquid assets market can improve the financial sector's strength during economics shocks and enhance the bank's profitability and efficiency.

2.5 Theoretical Framework

The theoretical framework is consisting of two parts, empirical models related to financial stability and bond or *Sukuk* or company are shown in the first part, and followed by the conceptual framework of this study which is developed based on prior related researches.

2.5.1 Empirical Model of Financial Stability

Due to the limitation of research in the relationship between *Sukuk* and financial stability, and *Sukuk* is also one kind of bond, the review was mainly focused on bond and financial stability.

Among the model that was used to develop the relationship between bond and financial stability is the one conducted by Hmida and Brahmi (2016). Their study covered 9 Asian countries (China, Korea, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore and Thailand) for a period from 1997 to 2009. Using the generalized method of moments (GMM), panel data as well as time series data they developed the following model.

$$FSI_{(i,t)} = f(Specific_Market_{i,t}, Macro_Control_{i,t},)$$

$$i = \{1 \dots N\} \quad (2.1)$$

Where i indicate the county, t represent the year and N is the 9 chosen countries over the study period. To concentrate on the banking sector, the dependent variable in this study was financial stability which was measured by three International Monetary Fund (IMF)'s financial stability indicators (FSIs), namely, capital adequacy, asset quality and profitability. At the same time, independent variables were divided into two groups, which are a specific index of bond market development and crucial control variables of macroeconomics. All variables used by Hmida and Brahmi (2016) are summarized in Table 2.1.

Table 2.1: Variables used by Hmida and Brahmi (2016)

Variables		Proxy	Ratio or description
Dependent variable	Financial stability	Capital adequacy	● $\frac{\text{regulatory capital}}{\text{risk-weighted assets}}$ ● Measure the bank's ability to absorb unexpected losses.
		Asset quality	● $\frac{\text{non-performing loans}}{\text{total gross loans}}$ ● Measure the quality of assets in the loan portfolio.
		Profitability	● $\text{return on asset} = \frac{\text{net income}}{\text{total asset}}$ ● Measure the efficiency of the bank using its assets.
Independent variables	The development of bond market	Ratio of corporate bond on credit	● $\frac{\text{local currency's corporate bond issuance}}{\text{bank credit allocated to the private sector}}$ ● Measure the control ability of bond market development to private sector's concentration in banking system. ● The lower the value, the stronger dependence of private sector banks.
		Ratio of bonds in local currency	● $\frac{\text{local currency bond issuance}}{\text{total bond issuance}}$ ● Measure the control ability of bond market development to the problem of exchange misalignment. ● The lower the value, the stronger dependence of foreign currency debt.
		Ratio of bond financing	● $\frac{\text{local currency bond}}{\text{total domestic financing}}$ ● Measure the control ability of bond market development to the problem of maturity mismatch. ● The lower the value, the higher proportion of bank loans and/or equity financing.
	Macroeconomic	Economic cycle	● Measured as the cyclical component of real GDP.
		Inflation	● Measured in terms of variation.
		Real interest rate	● Measured in terms of variation.
		Real exchange rate	● Measured in terms of variation.

Source: Hmida and Brahmi (2016)

In Table 2.1, the dependent variable is financial stability, and the independent variables are ratio of corporate bond on credit, ratio of bonds in local currency, ratio of bond financing,

economic cycle, inflation, real interest rate, and real exchange rate. Details of the variables are as follows.

Financial stability, the dependent variable. Three FSIs, namely, capital adequacy, asset quality and profitability were chosen as the proxy of financial stability. Among them, capital adequacy reveals the bank's ability to absorb unexpected loss and measured by regulatory capital to risk-weighted asset, whereas asset quality detects the quality of assets in the loan portfolio and measured by non-performing loans to total gross loans, and profitability checks the efficiency of the bank in using its assets and measured by return on assets.

In addition to bond market development indicators, key macroeconomic variables were also selected as the independent variables to study financial stability more comprehensively in Hmida and Brahmi's research. Among them, three indicators were chosen for the development of bond market, namely, private credit bond ratio, local currency bond ratio and bond financing ratio; and four key indicators were chosen for measure macroeconomic, namely, economic cycle, inflation, real interest rate and real exchange rate.

Three indicators for bond market's development are as follow: 1) The private credit bond ratio. It is to measures the control degree of bond market development in the private sector's concentration of banking system. It is also been calculated by the ratio of local currency's corporate bond issuance over the amount of bank credit allocated to the private sector; 2) The ratio of bonds in local currency. It judges the control ability of bond market development to the problem of exchange misalignment, and calculated by the ratio of local currency bond issuance over the total bond issuance; and 3) The ratio of bond financing. It

measures the control ability of bond market development to the problem of maturity mismatch, and calculated by the ratio of local currency bond over the total domestic financing.

Based on the Equation (2.1) and the variables selected above, the authors developed the empirical analysis through the following three sets of regression equation:

$$Y_1 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon_1 \quad (2.2)$$

$$Y_2 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon_2 \quad (2.3)$$

$$Y_3 = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \varepsilon_3 \quad (2.4)$$

where:

- Y_1 = capital adequacy (the first proxy of FSIs);
- Y_2 = asset quality (the second proxy of FSIs);
- Y_3 = profitability (the third proxy of FSIs);
- x_1 = ratio of corporate bond on credit, or ratio of local currency bond, or ratio of bond financing;
- x_2 = economic cycle (the first proxy of macroeconomic);
- x_3 = inflation (the second proxy of macroeconomic);
- x_4 = real interest rate (the third proxy of macroeconomic);
- x_5 = real exchange rate (the fourth proxy of macroeconomic);
- β_0 = constant term;
- $\beta_1, \beta_2, \beta_3 \dots \beta_{14}$ = partial regression coefficients; and
- $\varepsilon_1, \varepsilon_2, \varepsilon_3$ = error term or stochastic term.

Firstly, Equation (2.2) was run to verify the relationship between the bond market and financial stability. In this equation, capital adequacy as the first proxy of FSIs was the dependent variable, and the three proxies of bond market development (namely, the ratio of corporate bond on credit, the ratio of local currency bond, and the ratio of bond financing) participated into the Equation (2.2) take turns as one of the independent variables while holding the four macroeconomic variables constant. Three equations obtained in this way and those three equations proved the development of the bond market is of great significance to the improvement of capital adequacy. Furthermore, this positive effect is mainly due to the local currency bond financing and bond financing ratio. The authors pointed out the development of local currency bond market while reducing foreign-currency debt has raised capital. This situation means with stronger capital controls, the banking system is more resilient to shocks and losses.

Next, Equation (2.3) was run to check the relationship between the bond market and financial stability. In this equation, asset quality as the second proxy of FSIs was the independent variable. The three proxies of bond market development joined into Equation (2.3) take turns as one of the independent variables while holding the four macroeconomic variables constant. Hence, three more equations were gained, and those three new equations also proved the development of the bond market has a strong impact on asset quality. Moreover, this effect is particularly pronounced when bond development is measured by the proportion of bond financing. This is because the more bond financing, the less foreign-denominated debt, and thus the less misalignment of maturity and change, and thereby the higher asset quality of Banks and hence improve the banking sector's solvency.

Lastly, Equation (2.4) was run to test the relationship between the bond market and financial stability. In this equation, profitability as the third proxy of financial stability was the dependent variable, and the three proxies of bond market development involved into Equation (2.4) take turns as one of the independent variables while holding the four macroeconomic variables constant. Thus, another three new equations were formed, and those three equations once again proved that the development of the bond market has a significant positive impact on the banks' profitability. Furthermore, this result is especially true when bond market development is measured in terms of the ratio of private credit bond.

All in all, through the three steps above, this empirical analysis done by Hmida and Brahmi (2016) strongly proved that the development of the bond market can promote financial stability. And by reducing double misalignment of maturity and currency, asset quality of banks can be improved and then facilitated the development of bond market. In addition, this study also revealed that economic cycle, one of the macroeconomic control variables, is negative to capital adequacy and positive to the other two proxies of FSIs, i.e., asset quality and profitability. This indicates that financial system prefers to hold higher capital ratios during economic downturn, and economic prosperity is significantly correlated with the worsening of asset quality, meanwhile, economic growth is dovetailed with the high profitability of banks.

This study focused more on the impact of *Sukuk* on the company's financial stability, but it also introduces variables that are specific to the company. This is because some previous studies have clearly pointed out that the company's unique characteristics are also the indispensable factors for the company's financial stability (Orazalin et al., 2019; Lemus-Esquivel et al., 2015; Vieira, 2010; Skribans, 2009).

Orazalin et al. (2019) provided the latest model related to financial stability and the firm's specific characteristics based on forty-five (45) largest company that listed on the Russian Trading Stock Exchange from oil and gas industry spanning from 2012 to 2016. The data used are collected from Russia's sustainability reports, annual reports and audited financial statements, and subsequently Orazalin et al. (2019) developed the panel regression model as expressed in Equation 2.5 and the detail of variables used are tabulated in Table 2.2.

$$FS_{it} = \alpha_0 + \beta_1(SR_{it}) + \beta_2(FC_{it}) + \beta_3(LEV_{it}) + \beta_4(SIZE_{it}) + \beta_5(AGE_{it}) + \eta_i + \epsilon_{it} \quad (2.5)$$

where:

FS_{it}	=	financial stability to the company i at time t ;
SR	=	sustainability reporting which can be referred to the quality of sustainability information including economic index, environment index, social index and composite sustainability reporting index;
FC	=	financial capacity;
LEV	=	leverage;
$SIZE$	=	firm size;
AGE	=	firm age;
α_0	=	the constant term;
η_i	=	unobserved heterogeneity or the unobservable individual firm effects;
$\beta_1, \beta_2 \dots \beta_5$	=	partial regression coefficients; and
ϵ_{it}	=	the specific error terms.

Table 2.2: Variables used by Orazalin et al. (2019)

Variables			Description or calculation
Dependent variable	Financial stability (FS)		$\ln^{(Z-Score)} = \ln \left(\frac{\overline{ROA}_{it} + \overline{CAR}_{it}}{\sigma(ROA)_{it}} \right)$ where <i>ROA</i> means the return on total assets, <i>CAR</i> means capital adequacy ratio, <i>ln(.)</i> means the natural logarithm, <i>σ(.)</i> means the standard deviation.
Independent variables	Quality of sustainability information (SR)	Economic index (ECON)	$\sum_{j=1}^{rj} \frac{rj}{n}$ where <i>n</i> = 9, means the total 9 items reported in economic, <i>rj</i> = 1 if the information on the item is disclosed, otherwise equal to 0.
		Environment index (ENVN)	$\sum_{j=1}^{rj} \frac{rj}{n}$ where <i>n</i> = 34, means the total 34 items reported in environment, <i>rj</i> = 1 if the information on the item is disclosed, otherwise equal to 0.
		Social index (SOCL)	$\sum_{j=1}^{rj} \frac{rj}{n}$ where <i>n</i> = 48, means the total 48 items reported in social, <i>rj</i> = 1 if the information on the item is disclosed, otherwise equal to 0.
		Sustainability reporting index (SRIND)	$\sum_{j=1}^{rj} \frac{rj}{n}$ the overall quality of sustainability disclosure, where <i>n</i> = 91, means the total 91 items reported in economic, environment, and social, <i>rj</i> = 1 if the information on the item is disclosed, otherwise equal to 0.
	Characteristics of company	Financial capacity (FC)	$\frac{\text{free cash flows}}{\text{total assets}}$
		Leverage (LEV)	$\frac{\text{total debts}}{\text{total assets}}$
		Firm size (SIZE)	$\log^{\text{total assets}}$
		Firm age (AGE)	Years since the company was founded.

Source: Orazalin et al. (2019)

In Table 2.2, the dependent variable used in Orazalin et al. (2019) study was the financial stability, and measured by using the natural logarithm of the Z-Score. The independent variables were sustainability index of economic, environment, and social performance, firm's financial capital, leverage, size, and age.

A fixed-effects model was chosen after the Hausman's specification test was performed, and the empirical results got from descriptive statistics, correlation analysis, and panel regression analysis proved that the more disclosures information of sustainability, the stronger is the financial stability in the company. In addition, this study also revealed that the firm's financial capital, leverage, size, and age were the important aspects that needed to be noticed to promote financial stability of the firm.

2.5.2 Reviews of the Theories

There is obvious limitation on the theory related to *Sukuk* directly. However, *Sukuk* can also be treated as a bond. Thus, the relevant theories were mainly related to bond, such as Pecking Order Theory and Trade-Off Theory. The Pecking order theory was proposed by Donaldson in 1961, and then modified by Myers and Majluf in 1984. This theory postulates that company have specific preference order to raise the capital needed in their businesses, and suggests the use of financing decision in a firm's capital structure (Shahida & Sapiyi, 2013). Pecking order theory starts with asymmetric information which requires managers to know the prospects of the company very well, and this can help managers making a decision between internal and external financing, or make a decision between debt or equity issue. Usually, managers prefer to issue debt over equity because debt means managers have better confidence of getting profit from the investment decision, while equity means bring external ownership into the company (Shahida & Sapiyi, 2013).

Meanwhile, the trade-off theory is treated as a competitor theory to pecking order theory. It is obvious that the debt financing can bring tax benefit, thus this theory believes that the manager should decide the ratio of debt and equity financing in order to get a balance of cost

and benefit faced by the firm. Nevertheless, managers also need to be aware that as the debt financing ratio rises, the marginal benefit from debt financing will decrease, and hence bankruptcy cost and agency cost will be generated, and firm's future flexibility will decrease (Shahida & Sapiyi, 2013).

2.6 Summary

The financial crisis which happened in 2008 has induced scholars, institutions, investors, and regulators to pay attention to financial stability and *Sukuk* (Taoual, 2016; Dusuki, 2010). Financial stability usually refers to a state of equilibrium, which means all participants in the economy, regardless of a country or a company, can resist external shocks successfully, to accomplish its goals, and to achieve sustainable growth for a long-term (Pera, 2017; Bank of England, 2015; Bank Negara Malaysia, 2015b; Cernavskis, 2014; Rosengren, 2011; Schinasi, 2004). And *Sukuk* is a *Sharia*-compliant asset-backed financing certificate that prohibits interest (Saeed & Salah, 2014; Jamaldeen, 2012; Wilson, 2004).

It is noted that studies on financial stability and *Sukuk* are in initial stage, and a number of researchers had done the basic theoretical analysis on both financial stability and *Sukuk*, such as Wilson (2004), Alawode and Sadek (2008), Rosengren (2011), Zin et al. (2011), Saeed and Salah (2014). Empirical analysis of the relationship between financial stability and *Sukuk*/bond in the banking sector or national level also been carried out by Jeanneau and Tovar (2008), Burger et al. (2009), Berger, Klapper, and Turk-Ariss (2009), Zarate et al. (2015), Taoual (2016), Hmida and Brahmi (2016), Smaoui and Nechi (2017), Park et al. (2018).

Although there were a number of studies regarding both financial stability and *Sukuk* or bond, however, the studies focus on the corporate level are relatively rare, for instance, by Mohamed et al. (2015), Lemus-Esquivel et al. (2015) and Orazalin et al. (2019). Those studies provided inspiration for the conduct of this study in determining the effects of *Sukuk* on listed firms' financial stability in Malaysia.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This study attempts to investigate whether the relationship between *Sukuk*'s characteristics and the firms' financial stability existed. The dependent variable in this study is financial stability, which is measured by using Bharath and Shumway's naïve Distance to Default (DD) model whereas naïve DD was its proxy. The independent variables were composed of two parts, firstly, variables related to specific characteristics of *Sukuk* which included intensity of *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk* and proportion of *Sukuk*. Secondly, variables related to specific characteristics of a company which included firms' size, the valuation, the liquidity, the solvency, and the profitability of the firms. Descriptive analysis and multiple regression analysis were employed in this study. The detailed explanation is given in the following section.

The analytical technique employed to run the analysis is elaborated in this chapter. This chapter is divided into three sections. Firstly, conceptual framework is listed in Section 3.2. Next, data description is discussed in Section 3.3. Section 3.4 elaborated the model used to measure financial stability. Then, the regression model used for this study is presented in Section 3.5. Section 3.6 explained the data analysis consists the methods used in this study, and finally, Section 3.7 summarized what has been discussed in this chapter.

3.2 Conceptual Framework

This study explores the *Sukuk* issued by Malaysian firms and investigates the effects of *Sukuk* on firms' financial stability. Choosing a suitable measurement method for the firm's financial stability was the key to start the empirical analysis. Bharath and Shumway's naïve Distance to Default (DD) model, the most important theoretical improvements to Merton model in recent year (Cui & Cai, 2014), was developed by Bharath and Shumway in 2008. It was based on the Merton DD model with less tedious calculations and more operational (Bharath & Shumway, 2008). Besides, the World Bank (2016) also stated the Merton model was a common method used to measure the firms' financial stability.

Sukuk and the firms' financial stability were two related aspects. Previous studies had indicated that the positive effects of *Sukuk*/bond market on financial stability. *Sukuk*'s characteristics included intensity, tenure, coupon rate and proportion should be mentioned when talking about financial stability of a firm (Taoual, 2016; Zin et al., 2011; Burger et al., 2009; Jeanneau & Tovar, 2008). Smaoui and Nechi (2017) stated higher intensity of *Sukuk* could promote economic growth. Taoual (2016) believed longer tenure of *Sukuk* was good for the stability. One of the basic characteristics of bond was that, the coupon rate cannot be ignored when refer to bond (Sesar & Tomić, 2016; Jamaldeen, 2012). Hmida and Brahmi (2016) pointed the proportion of bond was benefit with financial stability. Thus, according to the studies done, variables related to the *Sukuk*'s characteristics included four (4) aspects, namely, intensity of *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk*, and proportion of *Sukuk*.

Besides, referred the literature review done in chapter two, company's size, liquidity, solvency (leverage), liquidity and profitability were the factors needed to be considered

when exploring the firm's financial stability (Orazalin et al., 2019; Lemus-Esquivel et al., 2015; Vieira, 2010; Skribans, 2009). Vieira (2010) stated the balance of profitability and liquidity means a lot to the firms' financial stability. Cernavskis (2014) and Pera (2017) believed firms' financial stability means the firms had the ability to repay its debt and maintain sustainable development for a long term. Yu and Zhao (2015) confirmed positive relationship existed between sustainability performance and firms' value. Thus, according to the studies existed, variables related to the specific characteristics of a company included five (5) aspects, namely, firm's size, valuation, liquidity, solvency, and profitability.

Therefore, based on the review of the previous literature, the dependent variable considered in this study was financial stability which was measured by naïve DD model, and the independent variables composed of two parts, which were characteristics of *Sukuk* and company respectively. The conceptual framework which revealed the relationship between the dependent variable and independent variables of this study is constructed as shown in Figure 3.1.

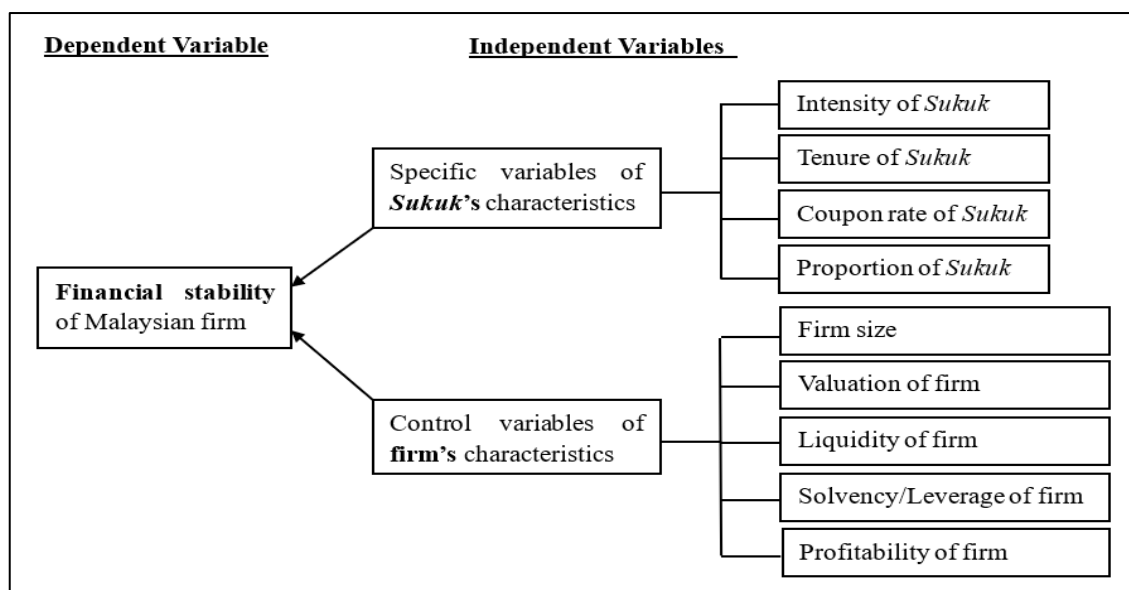


Figure 3.1: The Relationship between Dependent Variable and Independent Variables

Figure 3.1 depicts the relationship that existed among the variables in this study. The dependent variable was the financial stability of the firms that issued *Sukuk*, and the independent variables were divided into two parts. First, the specific *Sukuk* characteristics, which included intensity of *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk* and proportion of *Sukuk*. Besides, the control variables were the firms' characteristics, included firms' size, the valuation, the liquidity, the solvency, and the profitability of the firms. Each of the stated variables will be described below.

The financial stability of a company means that the firms can achieve sustainable development in long term and have enough cash flow to pay off the debt (Pera, 2017; Cernavskis, 2014). In this study, firms' financial stability was based on the Bharath and Shumway's naïve DD model (World Bank, 2016; Cui & Cai, 2014; Bharath & Shumway, 2008). This would be further elaborated in Section 3.4.

The first part of the independent variables was related to *Sukuk*. Followed the study done by Taoual (2016), this study also explored the relationship between the characteristics of *Sukuk* and financial stability. And in line with studies done by Smaoui and Nechi (2017), Taoual (2016), Jamaldeen (2012), and Hmida and Brahmi (2016), the variables related to the specific characteristics of *Sukuk* included four (4) aspects, namely, *Sukuk* intensity, tenure, coupon rate and proportion of *Sukuk*.

Intensity of *Sukuk*, refers to the total number of *Sukuk* issuance per company per year. This means that a company may have issued *Sukuk* more than once in a year. This variable served as one indicator of the *Sukuk* development (Smaoui & Nechi, 2017). Tenure of *Sukuk*,

means the length of time from *Sukuk* issued date to the maturity date, and measured by years. The same variable “*Sukuk* maturity”, was used by Taoual (2016), and served as one of the characteristics of *Sukuk*. Coupon rate of *Sukuk* is different from the coupon rate of the conventional bond. As interest is prohibited in Islamic finance, coupon of *Sukuk* refers to a stable payment flow which comes from a certain percentage of profits derived from the underlying asset. Thus, the coupon rate of *Sukuk* is a pre-determined specified profit rate. And it should be noted that the profit of *Sukuk* investors is not guaranteed, the investors may suffer losses (Jamaldeen, 2012). Proportion of *Sukuk* is similar to the “ratio of bond financing” which was used by Hmida and Brahmi (2016) and means that how much of the total asset that was funded by *Sukuk*. Those four proxies specific to *Sukuk* are expected to have positive correlated with financial stability, as many researches confirmed the role of bond/*Sukuk* in promoting financial stability (Taoual, 2016; Zin et al., 2011; Burger et al., 2009).

In addition, the specific characteristics of the firms are incorporated as control variables in this study. In line with prior research done by Skribans (2009), Cernavskis (2014), Lemus-Esquivel et al. (2015), Yu and Zhao (2015), and Orazalin et al. (2019), after a comprehensive consideration, the variables related to the company’s specific characteristics included five (5) aspects of the company, namely, firm’s size, valuation, liquidity, solvency, and profitability.

Firms’ size is an important and basic characteristic of a company (Dang, Li & Yang, 2018), and usually measured by the natural logarithm of the total asset (Orazalin et al., 2019; Lemus-Esquivel et al., 2015). As stated by trade-off theory, large firms were stronger in facing bankruptcy cost as they were far more diversified (Mohamed et al., 2015), and hence

the larger the company, the higher the company's financial stability (Skribans, 2009). Thus, it is assumed that a positive relationship exists between the firm size and financial stability.

Firms' valuation, which determines the potential value of a company and provides information about the company's share price. Price to earnings ratio (P/E ratio) was the proxy of the firms' valuation in this study which was normally used to explore the reasonableness of stock price by investors, and usually used to estimate their future earnings. The lower the value of this ratio means that the investment payback period is a shorter and with smaller risk, and thus a larger value of the investment (Danielson & Dowdell, 2001). Valuation has a great significance to a company's sustainable development which is closely related to financial stability (Pera, 2017; Yu & Zhao, 2015; Cernavskis, 2014). Thus, a positive relationship is assumed between valuation and firms' financial stability.

Firms' liquidity, reveals the company's ability to fulfil its short-term financial obligations. And quick ratio was selected to represent the liquidity of the company (Lemus-Esquivel et al., 2015). A company with high liquidity indicator tends to perform better during the 2008 financial crisis (Vieira, 2010). Thus, a positive relationship is assumed between liquidity and the firms' financial stability.

Firms' solvency ratio refers to the company's ability to fulfil its long-term debts and financial obligations. Debt to equity ratio (D/E ratio) was normally used as the indicator of the firms' solvency or leverage ratio (Lemus-Esquivel et al., 2015). D/E ratio indicates how much capital is in the form of debt and whether a company is able to meet its debt obligations persistently. The firms would face higher risk if this ratio increases (Lemus-Esquivel et al.,

2015). And Orazalin et al. (2019) found that leverage of the firms was significant and negatively related with firms' financial stability. Thus, a negative relationship is assumed between solvency and firm's financial stability.

Firms' profitability, reveals the result of the company's decision on investment and production planning, and the ability of a company to generate profit. Return on asset (RoA) was chosen as its proxy (Lemus-Esquivel et al., 2015; Reynaud & Thomas, 2013). Obviously, the higher the value of RoA means that the better the company operates. Thus, a positive relationship is assumed between profitability and firm's financial stability.

All the detailed explanation and measurement related to the dependent and independent variables in this study were summarized in Table 3.1.

Table 3.1: Definition of Variables

Variables		Label	Proxy and Description	Formula	Expected Sign.	
Dependent variable		Financial stability	Y	Naïve Distance to default (Equation 3.14).	Elaborated in Chapter three.	Not available
Independent variables	Specific characteristics of <i>Sukuk</i>	Intensity of <i>Sukuk</i>	X ₁	Total number of <i>Sukuk</i> issuance per company per year.	-	+
		Tenure of <i>Sukuk</i>	X ₂	The years for <i>Sukuk</i> last.	-	+
		Coupon rate of <i>Sukuk</i>	X ₃	The money paid by an issuer to bondholders on a regular basis	-	-
		Proportion of <i>Sukuk</i>	X ₄	The proportion of <i>Sukuk</i> financing. Issue amount of <i>Sukuk</i> over total asset.	$\frac{Issue\ amount\ of\ sukuk}{Total\ asset}$	+
	Specific characteristics of firm	Firm size	X ₅	Natural logarithm of total asset.	$log^{Total\ asset}$	+
		Valuation of firm	X ₆	P/E ratio. Forecast future earnings.	$\frac{Share\ price}{Earinings\ per\ shares}$	+
		Liquidity of firm	X ₇	Quick ratio. how well current liabilities can be covered, but this ratio is more accurate as excludes inventory.	$\frac{Current\ asset - Inventories}{Current\ liabilities}$	+
		Solvency of firm	X ₈	D/E ratio. Measure the share of debt in total capital.	$\frac{Total\ liabilities}{Total\ shareholders' equity}$	-
		Profitability of firm	X ₉	RoA. The ability of firm to make money from its assets.	$\frac{Net\ income}{Total\ asset}$	+

Sources: Taoual (2016), Lemus-Esquivel et al. (2015), Author's calculations

3.3 Data Description

The main objective of this study is to find out the influence of *Sukuk* on firms' financial stability in Malaysia spanning from 1997 to 2017. In this study, Malaysian firms' level were the main concern. According to the latest data from Malaysia International Islamic Financial Centre (MIFC), the global *Sukuk* issuance in 2018 was \$112.4 billion and 47% of them were issued by the corporate sector. Moreover, Malaysia hold the dominant position in the Islamic bond market in 2018 with a record of 50.4% of whole global *Sukuk* outstanding, at the end of 2018 it reached \$434.5 billion (Malaysian International Islamic Finance Centre, 2019). Thus, the scope of this study focuses on the Malaysian *Sukuk* market from the company level. Besides, the study covered companies that issued *Sukuk* from 1997 to 2017. Data for this study was obtained from Bond Info Hub Investing in Malaysian Bonds, the website under Bank Negara Malaysia (BNM) which was responsible to publish all bonds information in Malaysia and provided the historical data about *Sukuk* since 1997.

The dependent variable used in this research was financial stability of each firm that issued *Sukuk*, and proxied by the naïve DD probability based on Bharath and Shumway's naïve DD model which developed in 2008. The detailed information about this dependent variable was described in Section 3.3. While the independent variables used in this study were divided into two groups, which were specific variables on *Sukuk*'s characteristics and also variables of firms' characteristics.

The variables related to characteristics of *Sukuk* consisted of the intensity of *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk* and proportion of *Sukuk*. Intensity of *Sukuk* is the total number (Time) of *Sukuk* issuance per company per year, and the higher the intensity of the

Sukuk means the more activity of the company in *Sukuk* market, and thus, the better the development of *Sukuk* (Smaoui & Nechi, 2017). Tenure of *Sukuk* is the length of time from *Sukuk* issued date to the maturity date, and it was measured in years (Taoual, 2016). Coupon rate of *Sukuk* is a pre-determined specified profit rate derived from the underlying asset (Jamaldeen, 2012). Proportion of *Sukuk* is how much of the total asset that is funded by *Sukuk* and calculated by the issue amount of *Sukuk* over the total asset (Hmida & Brahmi, 2016).

Besides, the variables associated with the company's characteristics were also included, namely, firm size, firm valuation, firm liquidity, firm solvency, and firm profitability. Every firm had their own size, and firm size was commonly one important and fundamental characteristic of a company and could be proxied by the natural logarithm of the total asset (Dang et al., 2018; Lemus-Esquivel et al., 2015; Orazalin et al., 2019). Firm valuation provided the information of share price and the potential value of a company, and measured by price to earnings ratio ($= \frac{\text{share price}}{\text{earnings per share}}$) (Danielson & Dowdell, 2001). Firm liquidity revealed the company's ability to fulfil its short-term financial obligations. Quick ratio ($= \frac{\text{current asset} - \text{inventories}}{\text{current liabilities}}$) was selected as the proxy of liquidity of the company (Lemus-Esquivel et al., 2015). Firm solvency revealed the company's ability to fulfil its long-term debts and financial obligations and measured by debt to equity ratio ($= \frac{\text{Total liabilities}}{\text{Total shareholders' equity}}$) (Lemus-Esquivel et al., 2015). Firm profitability revealed how well a company generated profit and return on asset (RoA) ($= \frac{\text{Net income}}{\text{Total asset}}$) was chosen as its indicator (Lemus-Esquivel et al., 2015, Reynaud & Thomas, 2013).

As indicated earlier, data related to *Sukuk* were obtained from one website under Bank Negara Malaysia (BNM) named Bond Info Hub. While the data of the calculation of firm's financial stability and also firms' characteristics were obtained from Thomson Returns DataStream.

The sample size of this study consisted of 61 firms listed on Bursa Malaysia that issued *Sukuk*. The sample selection involved 5 steps. Firstly, all the firms that issued *Sukuk* were obtained from Bond Info Hub. There were altogether 164 firms that issued *Sukuk* from 1997 to 2017. Secondly, 58 company were excluded because they were not listed on Bursa Malaysia. Thirdly, 13 financial institutions (banks and insurance companies) were excluded from the sample because of the high leverage and high level of industry regulations imposed on them (Cooper, Jackson III, & Patterson, 2003). Subsequently, 23 sample companies were excluded as they were subsidiaries and their data had been merged into parent companies. It was because this study only focuses on the parent companies. Lastly, further 9 firms were subtracted out since financial data related to the company was not sufficient. After these five criteria, 61 sample firms as tabulated in the Table A.1 in Appendix were included in this study. The whole sample selection procedure was shown in Table 3.2:

Table 3.2: Sample Selection Procedure

Selection Criteria	Number of Sample Companies
All companies that issued <i>Sukuk</i> from 1997 to 2017	164
Less company do not list on Bursa Malaysia	(58)
Less financial company	(13)
Less subsidiaries of main companies	(23)
Less companies with insufficient data on financial	(9)
Final exist firm in the study sample	61

3.4 Forecasting Model of Financial Stability

As mentioned earlier, the main objective of this study is to establish the relationship between *Sukuk*'s characteristics and financial stability of Malaysian firms. For this purpose, one of the main questions that needed to be asked was how to measure financial stability. There were numerous measures of financial stability and they normally fallen into two broad categories. According to the Global Financial Development Report 2015/2016 published by the World Bank (2016), the first measurement referred the firm-level stability which means the stability for an individual company or institution. The second one was systemic stability which means the stability for an entire industry or whole economy or whole financial system. This study focused on Malaysian firms that issued *Sukuk*, thus more attention was given to the first category. Usually, two main methods were used to measure the firm-level stability, namely, the Z-score model and the Merton model (World Bank, 2016).

The Z-score model was the first common measurement of stability for individual institutions. This model combined firms' financial stability with bankruptcy probability, and was first established by Altman to predict the bankruptcy probability of listed companies in the 1960s based on 5 variables from 22 financial ratios (Xu & Wen, 2010). The Z-score model clearly analyzed and judged the firms' operation status and the possibility of bankruptcy, and usually used to measure a bank's stability. The higher the Z-score value, the lower the insolvency probability and the better the stability of the company. Besides, the Z-score was useful for the institutions that were lack of market data and allowed the institutions from different groups to compare default risk. However, as for the data for Z-score based on accounting data, and it may be biased by human factors (World Bank, 2016; Berger et al., 2009).

The Merton model is another common approach for measuring firms' level financial stability. This model is always used to determine a company's capacity to meet its financial obligations and to measure the overall likelihood of default. The Merton model, also known as the asset valuation model. Considering the volatility of assets, the model treats an institution's or company's equity as a call option on assets owned by that institution or company. A company's credit risk is the proxy for a put option that is priced by put-call parity. The Merton model measures the volatility weighted value of a company's assets when bondholders "exercise a put option" by anticipating payment. According to this model, the default will occur when the firms' liabilities exceed its assets. The Merton model is extremely useful in calculating the probability of corporate credit default (World Bank, 2016). The Merton model will be deliberated in the following section.

3.4.1 The Merton Distance to Default (DD) Model

Merton Distance to Default (DD) model applied the Merton (1974) framework. This model treated the company's equity as a European call option on the market value of the underlying assets with the strike price that was equal to the firms' debt level. It given the ideas about equity and corporate bond price, and was widely used for empirical analysis and commercial purposes. Merton DD model thought that default risk would be faced by the firms once their assets' market value was less than the total liabilities' book value, and made it possible for the selected company to calculate the default probability at any given point (Duyvesteyn & Martens, 2012; Bharath & Shumway, 2008).

There were two particularly important assumptions relating to the Merton model. The first imperative assumption was the total value of the company that follows Geometric

Brownian Motion (GBM) which assumed that the asset price had a constant volatility (Akansu & TorunTorun, 2015), and it followed the following stochastic differential equation:

$$dV = \mu V d_t + \sigma_v V dW \quad (3.1)$$

where:

- d = the sign of differential;
- V = the total assets value of the firm;
- μ = the expected return on the firm assets;
- σ_v = the volatility of firm asset; and
- W = a standard Wiener process.

The second essential assumption was that the company issues discount bond only, which was a bond issued below the face value and matured at time T. With those two assumptions, and according to Black-Scholes-Merton formula, the value of the firms' equity can be described as a function of firms' total assets value and debt value, while company's debt value was equal to the value of risk-free discounted bond minus the value of the company's put option based on put-call parity. Thus, the equity value of the company can be written as:

$$E = VN(d_1) - e^{-rT}FN(d_2) \quad (3.2)$$

and,

$$d_1 = \frac{\ln(V/F) + (r + 0.5\sigma_v^2)T}{\sigma_v\sqrt{T}} \quad (3.3)$$

$$d_2 = d_1 - \sigma_v\sqrt{T} \quad (3.4)$$

where:

- V = the total assets value of the firm;
- E = the market value of the firm's equity;
- F = the face value of the firm's debt (the default point);
- R = the instantaneous risk-free rate;
- T = the maturity of the debt; and
- $N(.)$ = the cumulative standard normal distribution function.

Jones, Mason and Rosenfeld (1984) pointed out that under the assumptions of Merton model, the Equation (3.2) still needs to follow the elastic relationship as followed which is directly follows Ito's lemma:

$$\sigma_E = \left(\frac{V}{E}\right) \frac{\partial E}{\partial V} \sigma_V \quad (3.5)$$

where σ_E is the volatility of equity value, and according to Black-Scholes-Merton model, $\frac{\partial E}{\partial V} = N(d_1)$, so the Equation (3.5) can be written as:

$$\sigma_E = \left(\frac{V}{E}\right) N(d_1) \sigma_V \quad (3.6)$$

Following Itô's lemma, one stochastic calculus was discovered by Professor Kiyosi Itô from Japan (Ikeda, Watanabe, Fukushima, & Kunita, 2012). This was as depicted in the Equation (3.6) which links equity volatility and asset volatility. The Merton model converted the value and volatility of the company's equity into the implied default probability via the

nonlinear Equation (3.2) and (3.6). Except for parameters V and σ_V which cannot be directly observed and need to be inferred, other variables in the Merton model were directly observable. Thus, the following four steps need to be followed in order to implement the Merton model, which were:

1) To estimate the volatility of equity value (σ_E) based on historical stock returns or option-implied volatility data. Usually, historical returns data was picked to get equity volatility;

2) To select a prediction range (T), and measured the face value of the company's debt (F). Usually, assumed the prediction range of one year, and took the book value of the company's total liabilities as the face value of the company's debt;

3) To collect the data of risk-free rate (r) and the company's market value of equity (E);

4) To solve the company's total value (V) and the volatility of the company (σ_V) using Equation (3.2) and (3.6).

Once the company's total value (V) and volatility of the company (σ_V) were obtained, the Distance to Default (DD) can be calculated as follows:

$$DD = \frac{\ln(V/F) + (\mu - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}} \quad (3.7)$$

where μ was an appraisal of the expected annual return on a company's assets. Under the Black-Scholes-Merton model, DD follows the normal distribution, so the default probability also called expected default frequency (EDF) as below:

$$P_{def} = N(-DD) = N\left(-\left(\frac{\ln(V/F) + (\mu - 0.5\sigma_V^2)T}{\sigma_V\sqrt{T}}\right)\right) \quad (3.8)$$

The most important data of Merton model were the market value of equity (E), the face value of debt (F), and equity volatility (σ_E). And negative relationship was existed between firms' default probability and firms' market value of equity (E). Besides, the market being efficient and well-informed were the two conditions for the Merton model to work effectively.

The previous studies have confirmed that the Merton DD model was suitable for predicting the company's default risk and measuring the company's financial stability. However, this Merton DD model was easy to be modified (World Bank, 2016; Bharath & Shumway, 2008). The modified Merton DD model will be elaborated in the following section.

3.4.2 The Bharath and Shumway Model

Merton model was widely used after it was introduced to the public by Merton in his seminal paper (Cui & Cai, 2014; Falemstein & Boral, 2001; Bharath & Shumway, 2008). The Merton DD model can measure the firms' solvency risk as well as liquidity risk. The most difficult part of this model was that the company's total value (V) and volatility of the company's asset (σ_V) were not easily obtainable, two non-linear equations were required for those two parameters. Moreover, since Merton DD model can be easily improved, the

theoretical circle had made continuous attempts and efforts to do the contribution of Merton DD model so that to make this model easier to be used (Cui & Cai, 2014; Falemstein & Boral, 2001).

Through empirical research, Bharath and Shumway (2008) found that it was useful for Merton DD model to be used for forecasting default for functional form. Then they proposed a new and easier way to predicting default based on Merton DD model, namely, naïve DD model. The naïve DD model built a simple alternative probability based on Merton DD probability that does not required to solve Equation (3.2) and (3.6) described in Section 3.4.1. This naïve DD model provided a reduced-form of Merton DD model, meanwhile, it had the same functional form and the basic input variables as Merton DD model; and it was easier to compute DD.

The naïve DD model might be one of the most important theoretical improvements to Merton model in recent years (Cui & Cai, 2014), and it had been adopted by many scholars since it was proposed, such as Campbell, Hilscher and Szilagyi (2008), Agarwal and Taffler (2008), Bauer and Agarwal (2014) and so on. In order to predict financial stability more concisely and accurately, this study also followed the Bharath and Shumway's naïve DD model and the following part of this section had elaborated on this new naïve DD model.

Before establishing the new probability, Bharath and Shumway (2008) let the market value of each company's debt equal to the face value of its debt approximately:

$$naïve D = F \tag{3.9}$$

And according to the accounting identity, the company's assets (V) were equal to the sum of the market value of the risky debt (D) and the equity value (E), in this way:

$$V = E + F \quad (3.10)$$

After this, Bharath and Shumway (2008) were of the opinion that a company on the brink of default were usually with the risky debt, and debt risk was closely related to equity risk. Thus, the debt volatility of each company could be approximated as:

$$naïve \sigma_D = 0.05 + 0.25\sigma_E \quad (3.11)$$

where 0.05 representative the term structure volatility and the 0.25 equity volatility made the volatility correlated with default risk. And σ_D and σ_E were the volatility of debt and volatility of equity respectively. Therefore, the following weighted algorithm can estimate the volatility of the company's asset value approximately:

$$\begin{aligned} naïve \sigma_V &= \frac{E}{E+naïveD} \sigma_E + \frac{naïveD}{E+naïveD} naïve\sigma_D \\ &= \frac{E}{E+F} \sigma_E + \frac{F}{E+F} (0.05 + 0.25\sigma_E) \end{aligned} \quad (3.12)$$

where $naïve \sigma_V$ was the firm volatility, E was the market value of equity, F was the market value of total debt which would be measured by total liabilities.

Then, Bharath and Shumway (2008) set the expected return on the company's assets equal to the return on the company's stocks in the previous year:

$$naïve\mu = r_{it-1} \quad (3.13)$$

So far, this iterative procedure focused on the data of equity return over the entire year and had made it possible to capture some information same with Merton DD model. Then, the naïve distance to default can be defined as follows once got the parameter *naïve* μ :

$$naïveDD = \frac{\ln[(E+F)/F] + (r_{it-1} - 0.5naïve\sigma_V^2)T}{naïve\sigma_V\sqrt{T}} \quad (3.14)$$

where:

- naïveDD* = naïve distance to default;
- E* = market value of equity;
- F* = market value of total debt which will measured by total liabilities;
- r_{it-1}* = stock return over the previous one year;
- T* = time to maturity T is set to one year; and
- naïve* σ_V = the firm volatility.

Equation (3.14) preserved the Merton DD model and the calculation was extremely simple. The naïve DD probability was then written as:

$$naïveP_{def} = N(-naïveDD) \quad (3.15)$$

According to the literature review done in the preceding chapter, the World Bank (2016) stated the Merton model was an effective way to measure the financial stability of a company. At the same time, Bharath and Shumway (2008) developed a naïve DD model, which was

a reduced-form of the Merton model and easier to calculate. Thus, Bharath and Shumway's naïve DD model was chosen to measure Malaysian firms' financial stability and naïve DD was the proxy for the financial stability in this study.

3.5 Specification of Model

The naïve DD model created by Bharath and Shumway based on Merton DD model in 2008 was adopted to measure the default probability of the *Sukuk* issuers. And based on the function form done by Hmida and Brahmi (2016) and Orazalin et al. (2019), the empirical model of this study was established as follow:

$$naïve\ DD_i = f(Specific_Sukuk_i, Company_Control_i) \quad (3.16)$$

In the Equation (3.16), naïve DD_i was the distance to default of company i , which was the proxy of company's financial stability and worked as the dependent variable in this study. $Specific_Sukuk_i$ was the first part of independent variables that related to the four (4) characteristics of *Sukuk* issued by company i , which included intensity of *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk* and proportion of *Sukuk* (Smaoui & Nechi, 2017; Taoual, 2016; Jamaldeen, 2012; Hmida & Brahmi, 2016). $Company_Control_i$ was the second part of independent variables that are related to the characteristics of company i , which consisted of five (5) aspects as follows:

- a) Firms' size – measured by the natural logarithm of the total asset; b) Firms' valuation – proxied by price to earnings ratio (P/E ratio); c) Firms' liquidity – indicated by quick ratio; d) Firms' solvency – represented by debt to equity (D/E ratio); e) Firms' profitability –

proxied by return on asset (RoA) (Orazalin et al., 2019; Lemus-Esquivel et al., 2015; Reynaud & Thomas, 2013). Thus, Equation (3.16) can be rewritten as follows:

$$\begin{aligned} \text{naïve } DD_i = & \beta_0 + \beta_1 Int_i + \beta_2 Ten_i + \beta_3 CoR_i + \beta_4 PS_i + \beta_5 TA_i + \beta_6 P/E_i + \\ & \beta_7 QR_i + \beta_8 D/E_i + \beta_9 RoA_i + \varepsilon_i \end{aligned} \quad (3.17)$$

Focused on the year the company issued *Sukuk*, and studied the relationship between firms' financial stability and *Sukuk*'s characteristics as well as firms' characteristics, Equation (3.17) was used to measure the firm's financial stability for the year that issuing *Sukuk*. Where β_0 was the constant term; $\beta_1, \beta_2, \beta_3 \dots \beta_9$ was partial regression coefficients; ε_i was error term or stochastic term; naïve DD_i was the naïve distance to default of company i and used for the measurement of each firms' financial stability (Bharath & Shumway, 2008); Int_i , the intensity of *Sukuk*, was the total issuance numbers of *Sukuk* of company i , and used to measure the development of company's *Sukuk* (Smaoui & Nechi, 2017); Ten_i , the tenure of *Sukuk*, was the length of time from the *Sukuk* issue date to the maturity date issued by company i and measured by years (Taoual, 2016); CoR_i was the coupon rate of *Sukuk*, a pre-determined specified profit rate derived from the company i 's underlying asset (Jamaldeen, 2012); PS_i , the proportion of *Sukuk*, was the proportion of *Sukuk* funding of company i , and calculated by the issue amount of *Sukuk* over the total asset (Hmida & Brahmi, 2016); TA_i , the company i 's total asset, measured in Ringgit and calculated in the natural logarithm (Orazalin et al., 2019); P/E_i was the price to earnings ratio of company i and calculated by divided share price by earnings per share (Danielson & Dowdell, 2001); QR_i was quick ratio of company i and measured as current assets minus survival and then divided by current liabilities (Lemus-Esquivel et al., 2015); D/E_i was debt to equity ratio

of company i and measured as total liabilities divided by total shareholders' equity (Lemus-Esquivel et al., 2015); RoA_i was the return on asset of company i , and measured as net income divided by total asset (Reynaud & Thomas, 2013). Detail information of all the variables used in this study could referred to Table 3.1.

Based on the literature review done in Chapter Two, many studies conducted by Davis and Stone (2004), Jeanneau and Tovar (2008), Burger et al. (2009), Zin et al. (2011), Samsuddin, Tafri, Nawawi and Aziz (2011), Zarate et al. (2015), Hmida and Brahmi (2016), Taoual (2016) demonstrated that the development of bond/ *Sukuk* markets had promoted financial stability, therefore, the sign of variables related to *Sukuk* were all expected to be positive (namely, variables of Int_i , Ten_i , CoR_i , and PS_i).

On the other hand, according to studies done by Skribans (2009), Cernavskis (2014), Lemus-Esquivel et al. (2015), Yu and Zhao (2015), and Orazalin et al. (2019), parameters related to the company were all expected to have positive relation with DD exclude the D/E ratio. D/E ratio told us the proportion of capital were financed by debt. If the ratio increased, the firms would become risky, because a higher ratio might mean that the company were not able to meet its debt obligations, thus the parameter of this variable was expected to be negative.

3.6 Data Analysis

A total of sixty-one (61) Malaysian listed companies as shown in Table A.1 in appendix issued *Sukuk* from the year 1997 to 2017, and those sample companies could be further classified as in Table 3.3:

Table 3.3: Analysis of Sample Companies

Number of Years Issued <i>Sukuk</i>	Number of Companies Issued <i>Sukuk</i>	Observations
5	1 (Table A.1, No. 1)	5 (5*1)
4	0 (Nil)	0 (4*0)
3	6 (Table A.1, No. 2 to 7)	18 (3*6)
2	11 (Table A.1, No. 8 to 18)	22 (2*11)
1	43 (Table A.1, No. 19 to 61)	43 (1*43)
Total	61 Companies	88 Observations

Based on Table A.1 in appendix and Table 3.3, from year 1997 to 2017, only one (1) company issued *Sukuk* for five (5) years, which were years 1997, 2001, 2004, 2013, and 2014. Besides, there were six (6) companies issued *Sukuk* for three (3) years (as listed from No.2 to No.7 in the Table A.1). Furthermore, there were eleven (11) companies (as listed from No.8 to No.18 in the Table A.1) in Malaysia had been issued *Sukuk* for two (2) years. Additionally, there were forty-three (43) companies (as listed from No.19 to No.61 in the Table A.1) had been issued *Sukuk* for one (1) year. Finally, the total observations gained were eighty-eight (88).

It was observed that the companies did not issue *Sukuk* every year and they could only have issue *Sukuk* once in their life time. According to the data collected, more than 70% of the sample companies issued *Sukuk* once only, thus, the data could not be formed as panel data. Then, this study would list down all the sample companies by the time *Sukuk* was issued and then the time factor to be ignored. Therefore, the data used in this study was treated as cross-section data.

Briefly, this study explored the relationship between *Sukuk*'s characteristics and firms' financial stability, thus, the focused in this study was the companies' financial stability of

the year when *Sukuk* was issued. Additionally, financial stability, which is the independent variable in this study was proxied by naïve distance to default, while the dependent variables were characteristics of *Sukuk* (*Sukuk*'s intensity, tenure, coupon rate and proportion) and the characteristics of firms (firms' size, valuation, liquidity, solvency and profitability). Furthermore, the analytical technique employed in this study was divided into two parts. Firstly, descriptive statistics were used to analyze and infer the overall characteristics of the sample data. Secondly, multiple regression analysis was employed to find the relationship between financial stability and characteristics of *Sukuk* as well as the company's characteristics.

3.6.1 Key Parameters of Distance to Default (DD)

Distance to Default (DD) of the sample company was used as the proxy of financial stability, and act as dependent variables in this study. Thus, obtaining DD data accurately was the key to this study. The key parameters needed in the process of determining DD was equity volatility (σ_E). Bharath and Shumway (2008) obtained the σ_E based on the stock earnings data of the previous year in the target year. Following them, this study also estimated σ_E based on the relevant historical data of the sample companies. First of all, it was necessary to get daily stock volatility (σ) as follows:

$$\sigma = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (\mu_i - \bar{\mu})^2} \quad (3.18)$$

Where, μ_i is daily return of stock and calculate as:

$$\mu_i = \frac{p_{i+1} - p_i}{p_i} \quad (3.19)$$

Where p_i was the stock price on the day i . Supposed the number of trading days in a single stock year was D , this study would use 250 as the trading days which was the annual average trading days commonly used by scholars, and then the standard deviation of annual return rate, namely, the volatility of equity value σ_E was:

$$\sigma_E = \sigma\sqrt{D} \quad (3.20)$$

3.6.2 Descriptive Analysis

Descriptive statistics was used in this study to provide essential evidence for an initially analysis and to infer the overall characteristics of the sample data. As one of the statistical methods, descriptive statistics was a method of analyzing data in the form of a table or chart, and performing relevant processing on numerical facts or data. This method provided a summary of a given entire population or a sample data set with a set of short description coefficients. Descriptive statistics would provide a useful summary based on its historical account of return behavior once empirical and analytical analysis was conducted. Numerical measures of descriptive statistics were chosen in this study, usually, it would include measures of location, variability, distribution shape, relative location, detecting outliers and so on.

Measurement of the tendency of the sample had always containing mean, median, mode, percentiles and quartiles. The mean of the data set perhaps was the most important index for the measure of location, and it was the average of all the data values and provided a measure of central location. The measure of variability usually took into account for the measurement of variability and the measurement of tendency. Range, interquartile range, variance,

standard deviation and coefficient of variation were usually covered for the measure of variability. The standard deviation (SD) of the data set was the most popular index of variability measure. SD was measured in the same units as the data so that making it more easily interpreted compared with variance. In addition, the minimum and maximum variables were also included for numerical measured in this study.

3.6.3 Multiple Regression Analysis

Multiple regression was employed by using simple linear regression which was usually used to predict the value of a dependent variable based on explained by the value of two or more independent variables. Thus, this analytical technique was employed by this study to explore the relationship between firms' financial stability and characteristics of *Sukuk* as well as the company's characteristics.

3.6.3.1 Ordinary Least Squares (OLS)

Ordinary Least Squares (OLS) method was selected as a method of parameter estimation in this study. It is one of the commonly used conventional analytical technique to estimate the coefficients of the input variables in a linear regression model, and minimizing the sum of squared errors at the same time. Wooldridge (2008) and Maturo (2016) confirmed the OLS estimators were the best linear unbiased estimator (BLUE) in the linear regression model. The best here means the OLS estimators have the smallest variance according to the Gauss-Markov theorem. Meanwhile, Gujarati and Porter (2009) stated that OLS method that used to estimate the regression equation had best approximated the best fit of the straight line between the independent and dependent variables. The OLS estimators were obtained by Yi (2016) as follows:

Firstly, assumed $y = X\beta + \varepsilon$ was a real model form, and then the OLS estimates were achieved via minimizing the sum of squared errors:

$$RSS(\beta) = (y - X\beta)'(y - X\beta) \quad (3.21)$$

Taking the derivative of Equation (3.21) with respect to β and then set its first order differential equal to zero:

$$\frac{\partial RSS}{\partial \beta} = \left(\frac{\partial RSS}{\partial \beta_1}, \frac{\partial RSS}{\partial \beta_2}, \dots, \frac{\partial RSS}{\partial \beta_p} \right)' = -2X'y + 2X'X\beta \quad (3.22)$$

After this, assumed that X had a full rank, and simplified the Equation (3.22) could obtained:

$$\hat{\beta}^{ols} = (X'X)^{-1}X'y \quad (3.23)$$

In order to get the minimizes value the Equation (3.21) from Equation (3.23), we took the second derivative of Equation (3.21) with respect to parameter β' , which was

$$\frac{\partial^2 RSS(\beta)}{\partial \beta \partial \beta'} = \begin{bmatrix} \frac{\partial^2 RSS(\beta)}{\partial \beta_1^2} & \frac{\partial^2 RSS(\beta)}{\partial \beta_1 \partial \beta_2} & \dots & \frac{\partial^2 RSS(\beta)}{\partial \beta_1 \partial \beta_p} \\ \frac{\partial^2 RSS(\beta)}{\partial \beta_2 \partial \beta_1} & \frac{\partial^2 RSS(\beta)}{\partial \beta_2^2} & \dots & \frac{\partial^2 RSS(\beta)}{\partial \beta_2 \partial \beta_p} \\ \vdots & \vdots & \ddots & \vdots \\ \frac{\partial^2 RSS(\beta)}{\partial \beta_p \partial \beta_1} & \frac{\partial^2 RSS(\beta)}{\partial \beta_p \partial \beta_2} & \dots & \frac{\partial^2 RSS(\beta)}{\partial \beta_p^2} \end{bmatrix} = 2X'X \quad (3.24)$$

$X'X$ would be the positive definite within the assumption that X was full rank. Then, Equation (3.23) was the minimum value of Equation (3.21). Thus, Equation (3.23) was called OLS estimator of β .

The function of the OLS model used in this study was to find out whether there was a significant relationship between any of the independent variables and the dependent variable in the model. The coefficient slope was functioning as an indicator of how much the dependent variable would change with the changes of the independent variables. In the OLS model, the best fit function based on the sample data was obtained via minimizing the sum of squared errors. The OLS test used in this study was expressed as:

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_9 x_9 + \varepsilon_i \quad (3.25)$$

Where y_i was DD of every target company, β_0 was a constant variable, β_1, β_2 , until β_9 were the regression coefficient. For x_1 until x_4 were the specific independent variables related to the four (4) characteristics of *Sukuk*, which contains intensity, tenure, coupon rate and proportion of *Sukuk*. And x_5 until x_9 were the control independent variables related to the five (5) characteristics of a company, which includes firm size, firm valuation, firm liquidity, firm solvency, and firm profitability. Besides, ε_i was an error term or disturbance.

3.6.3.2 Diagnostic Testing

After the preliminary model was obtained, relevant diagnostic checking was required for the model to ascertain whether the residuals from the fitting regression imitated the assumed behaviour of the unobservable function errors sufficiently. Thus, to enhance the

rationality of the model and to improve the data interpretation ability of the mode. Diagnostic checking used in this study were as follows:

(a) Heteroscedasticity

Heteroscedasticity occurred when the reality fails to satisfy the key assumption of the classical linear regression model (CLRM) that the error terms had the same conditional variance. Heteroscedasticity meant that the residual term varies with the change of the explanatory variable, but still obeyed the normal distribution. Heteroscedasticity was more common for cross-sectional data than time series data. It made the estimation of regression standard deviation no longer unbiased, but OLS estimators of regression coefficients were still unbiased and consistent, and did not affect R^2 and adjusted R^2 . Thus, regression analysis that used heteroscedasticity data would still provide an unbiased estimate for the relationship between the predictor variable and the outcome. On the other hand, heteroscedasticity would make the variance estimation of the regression coefficient OLS estimators no longer unbiased. OLS estimators were no longer valid and asymptotically valid, what's more, the t-statistics and F-statistics did not obey the original distribution, and lend to the failure of hypothesis testing, interval estimation and interval prediction.

There were several methods to test for the presence of heteroscedasticity, such as Goldfed-Quant test, Glejset test, Breusch-Pagan test, White test, ARCH test and so on. In this study, White General test had been chosen to test the attendance of the heteroscedasticity. The white test observed the relationship between the variance of the error term and the square of each independent variable and the interaction term of each two independent variables.

(b) Multicollinearity

As stated by Weeraratne (2016), the volatility of OLS estimates' value would be increase and the regression coefficients' standard deviation became infinite when the multicollinearity problem occurred, which finally resulted not robust in OLS. Multicollinearity referred to the existence of an exact or inexact linear relationship between two or more explanatory variables. It failed to fulfil one key assumption of the classical linear regression model (CLRM) that explanatory variables were independent of each other. There were two manifestations of multicollinearity, namely, perfect multicollinearity and approximate multicollinearity or intercorrelated. The perfect multicollinearity was rare, and $(X'X)^{-1}$ in Equation (3.23) did not present which lead to the failure to get OLS parameter estimator if it existed. The cause of multicollinearity was not singular, such as the cross-sectional data were closely related in the economic sense, economic variables often had a common change trend with the change of time and so on. One thing to be aware was that multicollinearity did not imply any violation of basic assumptions unless it was perfect multicollinearity, thus, OLS estimators still have a good statistical property even if there was a high degree of multicollinearity. However, the problem was that even though OLS was still the best estimation method, it was not "perfect", especially in terms of statistical inference, it cannot provide useful information.

Usually, there were two approaches to check the presence of multicollinearity, a simple correlation coefficient method was used for two explanatory variables, and a comprehensive statistical test method was adopted for multiple explanatory variables. For the first method, if the correlation coefficient between the two explanatory variables was close to one, it indicated that there was strong multicollinearity between the two variables.

In terms of the second method, OLS was conducted on the model to obtain the parameter estimation table. If R^2 and F were large and the t-test value of the regression coefficient was less than the critical value, it means that the model had multicollinearity. By using this method, R^2 was vital to determine the rejection rule of the hypothesis on F test. Higher R^2 was forcing the partial coefficient in F test were simultaneously equal to zero, but it was inversely in t-test which was statistically different from zero. The F test could be constructed as follows:

$$F_j = \frac{R_j^2/(k-2)}{(1-R_j^2)/(n-k+1)} \sim F(k-2, n-k+1) \quad (3.26)$$

Where k was the number of explanatory variables including the intercept term, n was the sample size, and R_j^2 was the determined coefficient of the j explanatory variable on the regression equation of other explanatory variables. The value of R_j^2 would be large and close to 1 if strong multicollinearity existed. The hypothesis for F test regression was:

$$\begin{aligned} H_0: \beta_1 = \beta_2 = \dots = \beta_p = 0 & \quad (\beta_j \text{ means at least one variable does not} \\ H_a: \beta_j \neq 0 & \quad \text{equal to zero}) \end{aligned}$$

If the p -value of calculated F -test was less than 5% of significant level, the null hypothesis would be rejected. Otherwise, there did not have enough statistical evidence to reject the null hypothesis if the p -value of calculated F -test was more than 5% of significant level.

3.7 Summary

This study was aimed to focus on Malaysia listed firms and to examine the financial stability of the listed companies that issued *Sukuk* from 1997 to 2017. The main objective was to establish whether *Sukuk*'s characteristics would affect financial stability of the Malaysian firms.

In order to realize this, data on companies that issued *Sukuk* from 1997 to 2017 was used, and finally 61 companies were chosen as the sample. The naïve DD model developed by Bharath and Shumway (2008) based on Merton model, as a tool to measure financial stability of firms, was use as the financial stability's proxy, i.e., the dependent variable. The first part of independent variables were characteristics of *Sukuk* which include intensity *Sukuk*, tenure of *Sukuk*, coupon rate of *Sukuk*, and proportion of *Sukuk*. The second part of independent variables were characteristics of the company comprising of firms' size, firm s' valuation, firm s' liquidity, firm s' solvency, and firm s' profitability. For the data analysis, descriptive statistics were first employed to analyze the central tendency and variability of the sample data, and then the multivariate regression analysis was employed to establish factors that may influence financial stability of the Malaysian firms.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

As indicated in earlier chapters, the objective of this study is to determine whether a relationship existed in between *Sukuk*'s characteristics and firms' financial stability. The study period focused on firms that issued *Sukuk* in the year from 1997 to 2017, and sixty-one (61) companies listed on Bursa Malaysia were selected. The data was collected from Thomson Returns DataStream and a website named Bond Info Hub. Bharath and Shumway's naïve Distance to Default (DD) model based on Merton Distance to Default (DD) model was used to measure the firms' financial stability, which acted as the dependent variable. The variables that were employed to examine the influence of *Sukuk*'s characteristics on firms' financial stability were made up of specific variables related to *Sukuk* and the control variable related to the companies. The characteristics of *Sukuk* included the intensity, the tenure, the coupon rate and the proportion of *Sukuk*. In addition, firm size, valuation, liquidity, solvency, and profitability of the firms, the elements reflect firm's characteristics were also included. The analytical techniques used to examine the significant factors that influence the firm's financial stability were descriptive analysis, correlation and multiple regression analysis.

4.2 Descriptive Analysis

The results of the descriptive analysis of the variables used in this study were shown in Table 4.1. The total number of observations was 88, and the mean of the company's distance to default (DD) was 3.26 with a standard deviation of 2.72, and its value spanning from -1.47 to 12.27. The mean of 3.26 did not differ significantly from the median with 3.06, which signified that this dependent variable naïve DD was symmetrically distributed.

Table 4.1: Descriptive Analysis of Variables

	Mean	Median	Standard Deviation	Minimum	Maximum	Objectives
DD	3.2588	3.0619	2.7192	-1.4655	12.2704	88
Int (time)	69.1705	36.0000	100.1149	1.0000	610.0000	88
Ten (year)	10.4492	5.1286	20.3282	1.9973	100.0658	88
CoR (%)	2.8111	2.8523	2.8799	0.0000	8.6083	88
PS (%)	0.4394	0.1848	0.9656	0.0074	8.1104	88
TA (bil. RM)	8.5200	2.0915	19.1504	0.0528	110.6502	88
P/E (time)	12.7364	11.8500	14.2197	-51.7391	62.3000	88
QR (%)	1.5650	1.3550	1.5770	0.0800	12.7200	88
D/E (%)	1.7357	1.4103	1.5783	0.1388	6.7687	88
RoA (%)	4.0460	4.0000	7.0561	-27.1600	26.0400	88

Note: DD, distance to default; INT, intensity of *Sukuk*; TEN, tenure of *Sukuk*; CoR, coupon rate of *Sukuk*; PS, proportion of *Sukuk*; TA, total asset (billions of ringgit); P/E, price to earnings ratio; QR, quick ratio; D/E, debt to equity ratio; RoA, return on asset. The variables are grouped by data form Malaysian firms with N=88, T=21.

In terms of the specific independent variables related to *Sukuk*, from Table 4.1, the intensity of *Sukuk* (Int) referred to the total number *Sukuk* issuance per year per company, has a mean of 69.17 with standard deviation of 100.11. Also, the range of this variable's value varies greatly, from 1 to 610, suggested that there was one sample company issued *Sukuk* once in a certain year while another sample company issued *Sukuk* 610 times in a certain year. This may conclude that the market of *Sukuk* issuance in Malaysian is uneven and some companies showed great interest in issuing *Sukuk*.

Tenure of *Sukuk* (Ten), i.e., the years from issue date of *Sukuk* to the maturity date, its mean was 10.45 with a standard deviation of 20.33, and value of this variable also varies greatly from 2 to 100. The average maturity years of *Sukuk* was 10 years, and the shortest maturity years was two years while the longest was 100 years. This may suggest that *Sukuk*

could meet both short-term financing needs (one or less than one year) and long-term financing needs (more than five years).

As for the coupon rate of *Sukuk* (CoR), it is being acknowledged that interest was prohibited for *Sukuk*, and *Sukuk*'s coupon rate here means a pre-determined specified profit rate retrieved from the underlying asset. And it was paid by an issuer to bondholders on a regular basis. Its mean, median and standard deviation were around 2.8%, and the maximum value was 8.61% while minimum value was 0%. Therefore, the variable was symmetrically distributed and the coupon rate of *Sukuk* in Malaysia was balance.

The last variable related to *Sukuk* was the proportion of *Sukuk* (PS), calculated as the issue amount of *Sukuk* divided by total asset. The mean of this variable was only 0.44 and the maximum value is only 8.11. This ratio was not small, but one should remember was that the average maturity of *Sukuk* was 10 years which was a quite long period. Thus, though Malaysia leads the world's development of *Sukuk*, there is a potential to promote *Sukuk* development compared with other financing methods at the corporate level.

As for the control variable related to the company, firms' size was very important and should not be ignored when it comes to enterprises. Therefore, the first choice on the control variable for the companies was firms' size, and total asset has been used as a proxy for it. From Table 4.1, the mean of actual value of total asset was 8.52 with standard deviation of 19.15, and the units of total asset here was in billions of Ringgit. Its minimum and maximum value was 0.05 and 110.65 respectively. These two value spans were large, and it could be roughly seen that both large and small companies in Malaysia tend to favor the issuance of *Sukuk*.

Subsequently, P/E ratio, the proxy of firms' valuation which indicated the reasonable of the stock price for the sample companies, its mean value was 12.74 with standard deviation value was 14.22; this indicated that on average the investor was willing to pay RM12.74 for RM1.00 of current earnings. Additionally, P/E's minimum and maximum value were -51.74 and 62.3 respectively. This negative value may due to the company's negative net income and negative earnings per share, or may cause by the company's funds were used for large investment projects. Besides, the P/E values spanned widely, which indicated the stock price of the sample companies during the study period fluctuated greatly, and the investors' expectation of the companies in the future also changed greatly.

Next, the proxy of firms' liquidity, measured by quick ratio (QR). According to Table 4.1, the mean, median, and standard deviation were all greater than 1 and fluctuate around 1.5, which indicated that QR was well symmetrically distributed and the sample companies had the ability to repay their short-term debt.

Subsequently, D/E ratio was used as the proxy of firms' solvency. It measured the proportion of debt capital compared to equity, and to a certain degree, it indicates the firms' ability to meet its long-term obligation. As shown in Table 4.1, the mean of D/E ratio was 1.74 with the standard deviation of 1.58, and the median was 1.41. All the three value were above 1, and this suggested that the sample companies tended to raise fund via debt. The solvency ratio indicated that their ability to repay their long-term obligation is good.

Finally, firms' profitability was measured by the rate of return on asset (RoA). As shown in Table 4.1, RoA's mean and median were 4.046% and 4.0% respectively, which fluctuated

around 4. It was quite clear that the mean and median of this proxy were stable, and could concluded that this variable was symmetrically distributed. Indicate that the selected sample companies' ability to make money from their assets were stable. As stated by Ahmed, Rehan, Chhapra, and Supro (2018), company's benefit would be generated once its RoA bigger than the interest rate. And the average interest rate of Malaysia from 1997 to 2017 was 3.54. Thus, this profitability level was satisfactory. Furthermore, the minimum and maximum value of RoA were -27.16 and 26.04 respectively, and this negative RoA value was caused by the negative net income of the company.

4.3 Diagnostic Testing

To maintain data validity and robustness of the regression results of this study, the proposed multiple regression model must be tested for identifying any misspecification and correcting them so as to augment the study quality. These were assumptions that needed to be satisfied and tested in this study, which includes the multicollinearity rest and heteroscedasticity rests.

4.3.1 Heteroscedasticity

Heteroscedasticity occurs when the error term does not have the same conditional variance, and heteroscedasticity means the residual term changed with the explanatory variable (White, 1980). A test was proposed by White (1980) for heteroscedasticity which do not rely on the normality assumptions and easy to implement, based on the residuals of the fitted model and it may identify the specification bias and its generality.

In this study, White's heteroscedasticity test had been employed to test the existence of heteroscedasticity in the proposed regression model. Besides, hypothesis testing had been carry out by giving null hypothesis (H_0 : No Heteroscedasticity exists in the model) and alternative hypothesis (H_a : Heteroscedasticity exists in the model). Subsequently, the rejection rule had been adopted by using p -value to prove that whether heteroscedasticity exists or did not exists in the model. After that, a significance level of 1% (0.01) was selected to compare with the p -value obtained from the White's test.

Table 4.2 shows the result of White's test that was generated from the auxiliary regression by formulating the squared residuals of the original model. In Table 4.2, the p -value was 0.441, it was comparatively higher than critical value of 0.01. Thus, there was not enough statistical evidence to reject the null hypothesis. Therefore, it can be concluded that there was no heteroscedasticity exists in the proposed model, and the error term of the proposed regression model had the same conditional variance.

Table 4.2: White's Test Results

F-statistic	0.982025	Probability F(9,78)	0.4616
Obs*R-squared	8.956466	Probability Chi-Square(9)	0.4413

Note: Obs*R-squared represents the number of observations multiply with the centered R^2 .

4.3.2 Multicollinearity

Multicollinearity means the independent variables were not independent with each other, namely, there was an exact or inexact linear relationship between two or more independent variables. Usually, the simple correlation coefficient and high variance inflation factors (VIFs) were used to detect the existence of multicollinearity.

4.3.2.1 Correlation Coefficient

The simple correlation coefficient was always used to check the strength of the association between two variables or the degree to which two variables change together. The result had shown how strong a relationship that was existed between two variables. Its value ranged from -1 to 1, where 1 meant a strong positive relationship and -1 indicated a strong negative relationship, the strength of the correlation gradually increased as the absolute value approaches to 1. Zero value here proved no related at all between the two tested variables, every increment cannot bring any positive or negative increase.

The test result of the correlation coefficient was shown in Table 4.3. It has shown all the absolute values of the correlation ranged between -1 and 1. The variations in Distance to Default (DD) were positively correlated with variations in tenure of *Sukuk* (TEN), proportion of *Sukuk* (PS), total asset ($\ln^{TA}$), price to earnings ratio (P/E), quick ratio (QR), and return on asset (RoA). In addition, this matrix has shown that the correlation coefficient between the total asset ($\ln^{TA}$) and debt to equity (D/E) was the highest at 0.39 among all independent variables. According to Dormann et al. (2013), Vatcheva, Lee, McCormick and Rahbar (2016) and Marchal, Wathen and Lind (2017), multicollinearity was certainly existed if the correlation coefficient between the independent variables was equal to or higher than 0.7, which meant a strong correlation. It was clearly to see that 0.39 was smaller than 0.7, therefore, there was no multicollinearity existed among the variables.

Table 4.3: Correlation Coefficient Table

	DD	INT	TEN	CoR	PS	ln^{TA}	P/E	QR	D/E	RoA
DD	1.0000									
INT	0.3138	1.0000								
TEN	-0.0367	-0.1408	1.0000							
CoR	-0.1156	-0.0464	0.3037	1.0000						
PS	0.1402	0.1736	-0.0832	-0.1387	1.0000					
ln^{TA}	0.2955	0.0837	0.3563	0.2287	-0.3497	1.0000				
P/E	0.3563	0.1263	-0.0426	-0.0511	-0.1276	0.0461	1.0000			
QR	0.0429	0.1215	-0.1124	0.0058	0.0536	-0.1129	0.0046	1.0000		
D/E	-0.1964	0.0671	0.2046	0.2610	-0.1951	0.3866	-0.2549	-0.1339	1.0000	
RoA	0.2488	0.0433	-0.0125	0.0855	-0.0852	0.0637	0.1240	0.2418	-0.0667	1.0000

Note: DD, distance to default; INT, intensity of *Sukuk*; TEN, tenure of *Sukuk*; CoR, coupon rate of *Sukuk*; PS, proportion of *Sukuk*; ln^{TA}, total asset in natural logarithm form; P/E, price to earnings ratio; QR, quick ratio; D/E, debt to equity ratio; RoA, return on asset; The variables are grouped by data form Malaysian firms with N=88, T=21.

4.3.2.2 High Variance Inflation Factors (VIFs)

A variance inflation factor (VIF) was also used in this study to detect the multicollinearity in the proposed regression model. The VIF was a more formal test method; it measured the degree of variance expansion of the regression coefficient due to multicollinearity in the proposed regression model. Each explanatory variable in the equation had a VIF value, and a high VIF value indicated that multicollinearity increased the variance of the coefficient estimate, resulting in a reduced t-value. And it could be calculated by the following formula:

$$\text{Variance Inflation Factor, VIF} = \frac{1}{1-R_i^2} \quad (4.1)$$

where R_i^2 was the determining coefficient R^2 of the auxiliary regression obtained by x_i after OLS regression of all other explanatory variables in the original equation. The value of VIF showed the percentage of variance inflation for each coefficient. The higher the VIF was, the more serious the multicollinearity had been. Since there was no VIF threshold table, the empirical rule was usually adopted, that is, when the VIF was greater than 10 it was regarded as the standard for the existence of severe multicollinearity (Lin, 2008).

As shown in the following Table 4.4, the highest VIF belonged to the variable of total asset ($\ln^{TA}$) which was 1.51 (less than 10), and the mean VIF of all the explanatory variable was 1.24, far below the limit of 10. Therefore, the multicollinearity between the explanatory variables in this study was unlikely to have an effect on the estimation of the predetermined regression equation. Thus, it could conclude that there was no multicollinearity among variables in the model. Therefore, there was no co-relationship between independent

variables (as listed in the Table 4.4) in this study.

Table 4.4: Results of the Multicollinearity Tests

Variables	Variance Inflation Factor (VIF)	Variables	Variance Inflation Factor (VIF)
C	NA	Ln^{TA}	1.5091
INT	1.1630	P/E	1.1720
TEN	1.2783	QR	1.1161
CoR	1.1804	D/E	1.3944
PS	1.2670	RoA	1.1030
Mean Variance Inflation Factor		1.2426	

Note: NA, not available; C, constant term; INT, intensity of *Sukuk*; TEN, tenure of *Sukuk*; CoR, coupon rate of *Sukuk*; PS, proportion of *Sukuk*; Ln^{TA}, total asset in natural logarithm form; P/E, price to earnings ratio; QR, quick ratio; D/E, debt to equity ratio; RoA, return on asset; The variables are grouped by data from Malaysian firms with N=88, T=21.

4.4 Multiple Regression Model

This study used the Ordinary Least Squares (OLS) regression method to analyze the sample data. This study adopted the logarithm form to express the proxy of the firms' size which was a total asset and to reduce the value of the total asset, and a better multiple regression analysis. The OLS results obtained from E-view were presented in Table 4.5.

Table 4.5: Ordinary Least Squares (OLS) Results

Variable	Coefficient	Standard Error	t-Statistic	Probability
C	-14.4487	3.6552	-3.9529	0.0002***
Int	0.0052	0.0025	2.0922	0.0397**
Ten	0.0095	0.0129	0.7378	0.4628
CoR	-0.0975	0.0872	-1.1181	0.2669
PS	0.7342	0.2694	2.7254	0.0079***
Ln ^{TA}	0.8028	0.1745	4.6013	0.0000***
P/E	0.0482	0.0176	2.7378	0.0077***
QR	0.0478	0.1548	0.3089	0.7582
D/E	-0.3943	0.1729	-2.2801	0.0253**
RoA	0.0772	0.0344	2.2438	0.0277**
R-squared	0.4366	Adjusted R-squared	0.3716	
S.E. of regression	2.1557	Mean dependent var	3.2588	
Log likelihood	-187.1515	F-statistic	6.7153	
Durbin-Watson stat	1.8186	Prob(F-statistic)	0.0000***	

Note: C, constant term; Int, intensity of *Sukuk*; Ten, tenure of *Sukuk*; CoR, coupon rate of *Sukuk*; PS, proportion of *Sukuk*; Ln^{TA}, total asset in natural logarithm form; P/E, price to earnings ratio; QR, quick ratio; D/E, debt to equity ratio; RoA, return on asset; The variables are grouped by data from Malaysian firms with N=88, T=21. Asterisks (*), (**) and (***) denote rejection of the null hypothesis at 10%, 5% and 1% significant level respectively.

According to Table 4.5, the computed R-squared (R^2) of the regression equation was 0.4366 (43.66%), which indicated that 43.66 percent of the changes in the dependent variable, namely, naïve Distance to Default (DD) which was the proxy of the companies' financial stability, could be explained by changes in all the independent variables.

In terms of the test for overall significance of the Table 4.5, F test was conducted to determine whether a significant relationship existed between the dependent variable and the independent variables. From the results in Table 4.5, F-test's p -value was 0.0000 which was smaller than the critical value at 1% significance level. So, there was enough statistical evidence to reject the null hypothesis. Thus, it could be concluded that the independent

variables had significant overall impacts on the dependent variable (naïve DD, the proxy of firms' financial stability) at 1% level of significance.

Subsequently, the individual tests which included *t*-test was employed for the individual significance of each independent variable in the regression equation. Six out of nine independent variables' *t*-values were greater than critical value at 10% significant level. Thus, it can be concluded that six independent variables were significant at 10% significant level based on the *t*-test. The six independent variables were intensity of *Sukuk* (INT), proportion of *Sukuk* (PR), firm total asset (TA), price to earnings ratio (P/E), debt to equity ratio (D/E), and return on asset (RoA).

Furthermore, *p*-value was also chosen to check the significance of the regression coefficient at various level. According to the Table 4.5, six out of nine independent variables, namely, intensity of *Sukuk* (INT), proportion of *Sukuk* (PR), firm total asset (TA), price to earnings ratio (P/E), debt to equity ratio (D/E), and return on asset (RoA), were significant at 10% as well as 5% significance level. Besides, three independent variables were significant at 1% significance level, which were the proportion of *Sukuk* (PR), firm total asset (TA), and price to earnings ratio (P/E).

The specific discussion of each variable was presented in the following paragraphs to further elaborate the multiple regression equation. As indicated earlier, the independent variables consisted of two groups, namely, specific variables related to characteristics of *Sukuk*, and control variables related to characteristics of the company.

The specific variables related to characteristics of *Sukuk* constituted the first group of independent variables in this study. Intensity of *Sukuk* (Int) was the first proxy of *Sukuk*'s characteristics and this variable displayed a positive effect on firms' DD (the proxy of Firms' financial stability), the higher the *Sukuk*'s intensity, the more stable of the company. This is in line with the finding of Smaoui and Nechi (2017) which indicated positive association between *Sukuk* development and economic growth. This variable was significant at the 5% level.

Tenure of *Sukuk* (Ten), the second proxy of *Sukuk*'s characteristics, also shown a positive relationship with firms' DD, the longer the tenure of *Sukuk*, the more funds of the issuing company, hence, the more stable of the issuing company. This had supported Taoual's (2016) finding which argued that more long term of *Sukuk* were issued in the Gulf Corporation Countries (GCC) region. However, this variable was insignificant even at the 10% level.

Coupon rate of (CoR) was the third proxy related to the *Sukuk*'s characteristics. The estimated coefficient of this variable was negative and insignificantly related to firms' DD even at 10% significant level. This suggested the higher the coupon rate of *Sukuk*, the more profit should be distributed to investors, hence, the lower the financial stability of firms.

The last proxy of *Sukuk*'s characteristics was the proportion of *Sukuk* (PS). The coefficients of this variable were positive with firms' DD and significant at 1% significant level. This high significant might be explained by the Pecking Order Theory that the company's managers preferred to raise fund via debt, and debt financing indicated that the

managers acknowledged the company's situation well and they were confident with their investment activities. This finding was similar to a study done by Hmida and Brahmi (2016) that ratio of bond financing was significantly affected financial stability.

All in all, *Sukuk* could promote the firms' financial stability, and this positive and significant influence was applied mainly by intensity of *Sukuk* and proportion of *Sukuk*. Moreover, three out of four variables related to *Sukuk*'s characteristics which were intensity of *Sukuk* (Int), tenure of *Sukuk* (Ten), and proportion of *Sukuk* (PS) were positive related to firms' financial stability, while there was negative relationship existed between coupon rate of *Sukuk* (CoR) and firms' financial stability.

The control variables related to characteristics of the company itself were the second group of independent variables in this study, it included five (5) aspects of the company as follows: total asset, valuation, liquidity, solvency, and profitability.

Total asset (TA), the first basic characteristic of a company and the estimated coefficient was positive and statistically. This result shown there was positive and significantly relationship between total asset (TA) and DD (the proxy of financial stability) at the 1% level. This finding was in line with the study done by Skribans (2009) which indicated that the larger the company, the higher the company's financial stability.

The second variable related to the company's characteristics was the price to earnings ratio (P/E) used to measure the valuation of the firms. The estimated coefficient of P/E showed that valuation had a statistically positive and significant relationship with the firms'

DD at the 1% level. This supported the result of Yu and Zhao (2015) and Pera (2017) which indicated positive influence on financial stability as implied by a higher P/E value. The higher the P/E value, the higher the share price which indicated that investors had plenty of confidence in the company's future, and thus, the higher the financial stability of company.

Liquidity variable was the fourth aspect related to the firm's characteristics. The estimated coefficient of quick ratio (QR), acted as the proxy of liquidity, was positive and insignificant with the DD even at the 10% level. This finding suggested that the impact of company's short-term debt repaying ability on firms' financial stability was limited. This finding supported by study done by Vieira (2010), and could be explained by the study done by Pera (2014) and Cernavskis (2014) that financial stability was an indispensable condition for the company's long-term development, and firms' financial stability was firms' solvency which related to the firms' ability to repay long-term obligations.

Next, the proxy variable for solvency or leverage (debt to equity ratio (D/E)) was observed. The estimated coefficient of D/E was statistically significant and negatively related to the DD at the 5% level. This suggested that the higher the solvency or leverage, the higher bankruptcy probability, and this result supported the finding by Orazalin et al. (2019). Furthermore, this finding also supported by the trade-off theory that managers should be aware that marginal benefit from debt financing would decrease as the debt financing ratio increased. Thus, although *Sukuk* would enhance firms' financing stability, this did not mean that there was no limit. Managers should seek the balance between debt financing and equity financing that was in line with the reality of the firms.

Subsequently, the profitability of the company was the next variable with regard to firms' characteristics. The estimated coefficient return on asset (RoA) was statistically significant and positively related with the DD at the 5% level. The finding supported the result of Vieira (2010) and Hmida and Brahmi (2016) that profitability was important to company's financial stability. This proved that the better the company's ability to make money from its assets, the better the financial stability.

Among the variables related to firms' characteristics, firm size, firm valuation, firm solvency/leverage, and firm profitability were significantly influenced the firms' financial stability. This was primarily caused by total asset (TA), price to earnings ratio (P/E), debt to equity ratio (D/E), and return on asset (RoA). While, firms' liquidity which was proxied by quick ratio (QR) was insignificant with firms' financial stability, this was due to the liquidity was more related with short-term debt repay ability, while financial stability was more concern about long-term sustainable development. Furthermore, total asset (TA), price to earnings ratio (P/E), quick ratio (QR) and return on asset (RoA) were positive related with firms' financial stability, this was due to the better the firms' future earnings, the more assets and the high liquidity could strengthen the firms' ability to withstand risks, and thus better maintained the firms' financial stability. Besides, the debt to equity ratio (D/E) shown negative relationship with firms' financial stability as for excessive debt might brought more risk to the company.

4.5 Summary

The analysis of the relationship between *Sukuk* and financial stability of Malaysian firms was done through the following processes. The descriptive analysis had been carried

out to provide the overall characteristics of the Malaysian listed firms (both large and small companies) that issued *Sukuk*. It was proven that both short-term and long-term financing needs could be met via *Sukuk* market. Besides, the rate of coupon, which also meant a certain proportion of the profit distributed to investors was remained the same in *Sukuk* market, roughly about at 2.8%. Furthermore, it should be noted that the frequency of sample companies to issue *Sukuk* varied greatly, and the proportion of *Sukuk* financing was small when compared with other financing methods, and the potential development of Malaysian *Sukuk* market was vast.

Subsequently, diagnostic testing was done to ensure the validity of sample data and variables. A totally of sixty-one (61) companies, and data for one (1) dependent variable and nine (9) independent variables which related to *Sukuk* and company characteristics were proposed for the multiple regression model. Followed, heteroscedasticity test ensured the feasibility of the proposed model and found there was no heteroscedasticity existed in the model. Besides, multicollinearity analysis confirmed that there was no multicollinearity existed among the chosen variables. Thus, there were one (1) dependent variable and nine (9) independent variables involved for further multivariate regression analysis.

In the final step of analysis, multiple regression analysis was conducted to verify the relationship between nine (9) independent variables and financial stability (the dependent variable, proxied by naïve DD). The regression analysis result indicated the *Sukuk* could promote the firms' financial stability in Malaysia, especially the intensity of *Sukuk* (INT) and proportion of *Sukuk* (PS), both of them were significant and positive related to firms' financial stability. Moreover, the tenure of *Sukuk* (Ten) was positive but insignificantly

related to financial stability. Furthermore, the coupon rate of *Sukuk* (CoR) had a negative and insignificant influence on firms' financial stability.

With regard to variables related to firms' characteristics, firm size, firm valuation, firm solvency/leverage, and firm profitability were statistically significant with the firms' financial stability. And total asset (TA), price to earnings ratio (P/E), debt to equity ratio (D/E), and return on asset (RoA) were the contributors to this significant influence. Besides, the liquidity of the firm (proxied by the quick ratio (QR)) showed an insignificant relationship to firms' financial stability. Furthermore, all variables related to firms were positively related to financial stability excepted debt to equity ratio (D/E).

Thus, all the detail tested relationship among variables based on the specific objectives in this study could be summarized in Table 4.6 as follows:

Table 4.6: Summary of Relationship Tested Based on Specific Objectives

Specific Objectives	Descriptions	Expected Sign.	Empirical Findings	Supported
i	The relationship between <i>Sukuk</i> 's intensity and firms' distance to default.	+	+	Yes
ii	The relationship between <i>Sukuk</i> 's tenure and firms' distance to default.	+	+	Yes
iii	The relationship between coupon rate of <i>Sukuk</i> and firms' distance to default.	-	-	Yes
iv	The relationship between <i>Sukuk</i> 's proportion to firms' distance to default.	+	+	Yes
v	The relationship between firms' size and firms' distance to default.	+	+	Yes
	The relationship between firms' valuation and firms' distance to default.	+	+	Yes
	The relationship between firms' liquidity and firms' distance to default.	+	+	Yes
	The relationship between firms' solvency and firms' distance to default.	-	-	Yes
	The relationship between firms' profitability and firms' distance to default.	+	+	Yes

CHAPTER 5

CONCLUSION

5.1 Introduction

This study attempted to evaluate the potential relationship between *Sukuk*'s characteristics and financial stability of Malaysian firms that issued it. To be more specific, this study evaluated the relationship between the Malaysian listed firms' distance to default, as a proxy for financial stability, and the characteristics of *Sukuk* in terms of its intensity, tenure, coupon rate and proportion. Descriptive analysis and multiple regression analysis were employed to examine the influence of the chosen independent variables on the firm's financial stability. In addition to the characteristics of *Sukuk*, firms' characteristics were also included as independent variables. In this chapter, the main findings of this study, policy implications, limitations of this study and recommendations for future study will be presented below.

5.2 Summary of Findings

As indicated earlier, the objective of this study was to examine the relationship between *Sukuk*'s characteristics and financial stability of Malaysian listed firms that issued it. The sample companies were selected from the ones that issued *Sukuk* from 1997 to 2017. As the data related to *Sukuk* issuance was available from 1997. The dependent variable was firms' financial stability, and it was proxied by the naïve Distance to Default (DD) which was proposed by Bharath and Shumway based on Merton DD model in 2008. The independent variables used in this study were classified into two groups: characteristics of *Sukuk*, and firms' characteristics. The characteristics of *Sukuk* included the intensity of *Sukuk*, tenure of

Sukuk, coupon rate of *Sukuk* and proportion of *Sukuk*. While firms' size, valuation of the firm, liquidity of the firm, solvency of the firm, and profitability of the firm represented the firms' characteristics.

Firstly, the descriptive analysis provided that though the *Sukuk* issuance frequency of sample companies varied greatly, both large or small Malaysian companies were interested to meet their short-term and long-term financing needs via *Sukuk*. And the potential development of Malaysian *Sukuk* market was vast when compared with other financing methods.

Besides, a number of tests were also conducted to assess the validity of the data and model to be used, and they were heteroscedasticity test and multicollinearity test. Among them, the White's General heteroscedasticity test was chosen for the heteroscedasticity test, while correlation coefficient and high variance inflation factors (VIFs) were included for multicollinearity test. And their results indicated there were no heteroscedasticity and multicollinearity existed among the proposed model.

Furthermore, based on multiple regression, there were several important empirical results obtained from this study. The most important finding was that it provided one empirical evidence to confirm that *Sukuk* could promote the firms' financial stability. More specifically, the intensity of *Sukuk* (Int), i.e., the total number of *Sukuk* issuance per company per year, was positive and significantly related to firms' financial stability. Besides, the proportion of *Sukuk* (PS), i.e., the proportion of *Sukuk* financing of total capital structure, was also positive and significant related to financial stability, within a certain debt-equity

ratio, a higher proportion of *Sukuk* would make the company more stable. Furthermore, the tenure of *Sukuk* (Ten), i.e., the number of years from *Sukuk* issued till the date to the maturity date, was positively and insignificantly related to firms' financial stability, the longer the *Sukuk* maturity period, the more stable the company's capital, and thus the better the issuing company's financial stability. Moreover, the coupon rate of *Sukuk* (CoR), i.e., a pre-determined rate of profit derived from underlying asset paid to investors on a regular basis, was negative and insignificant related to firms' financial stability. Higher coupon ratio means more profit should be distributed to investors and thus company's profit would be damaged to certain extent.

In addition, the multiple regression results on the variables that were related to companies' characteristics provided evidences that firms' characteristics were closely associated to firms' financial stability. Among which firms' size (total asset), firms' valuation (P/E ratio), and firms' profitability (RoA) were all statistically significant and positively correlated with the firms' financial stability. Hence, these indicated that the larger the company, the better the firms' future earnings, and the stronger the firms' ability to generate profit, and hence this would lead to the stability of the company. Besides, firms' solvency/leverage (D/E ratio) was significantly and negatively related to firms' financial stability. As a company's manager, one should pay attention to firms' debt ratio which was integral in influencing firms' financial stability. The debt to equity ratio should be kept within a reliable range, and cannot be too high. Furthermore, firms' liquidity (quick ratio) was positively but insignificantly related to firms' financial stability, implying that firms' financial stability focused more on the long-term sustainable development rather than on the short-term.

As a conclusion, this study added an empirical analysis related to *Sukuk* and financial stability, and provided evidence that *Sukuk* could promote financial stability of the Malaysian firms that issued it. Specifically, *Sukuk*'s intensity and proportion had a positively and significant relationship with firms' financial stability. Besides, *Sukuk*'s tenure was positively correlated with firms' financial stability, while *Sukuk*'s coupon rate was negatively with firms' financial stability. Furthermore, with regard to variables related to the company, the empirical results showed that financial stability involved many complex factors and various aspects of company. Among others, firms' size, valuation, solvency/leverage, and profitability were all significantly affect the firms' financial stability. On the contrary, firms' liquidity showed a insignificant relationship with firms' financial stability.

5.3 Policy Implications

The study provides evidence that the issuance of *Sukuk*, a shining star in Islamic finance, has a significant impact on the financial stability of the company. This suggested that the Malaysian authorities should further open up the market, to encourage and to support those who are short of capital to raise funds by issuing *Sukuk* in a variety of ways. The proportion of *Sukuk* financing is still relatively low when compared to other sources of financing. Malaysia also can further consolidate and strengthen its leading role in the international Islamic financial development market by making corresponding publicity and promotion of Islamic finance in non-Muslim countries. Of course, relevant authorities should be engaged to carry out supervisor and regulatory functions of Islamic finance.

Furthermore, it is also essential to note that financial stability of the company is closely related to many aspects of the company itself, which may indicate that financial stability is

a comprehensive and dynamic concept. As a company's manager, one should make corresponding decisions based on the overall situation of the company instead of blindly expanding a single financing method; thus, this would ensure the overall financial stability of the company. Similarly, maintaining financial stability of a country is also a complex task. It is necessary to fully grasp the various participants in the market economic activities. In addition, a comprehensive coordination mechanism formed by comprehensive financial instruments, policy tools, regulatory tools and so on is also indispensable for maintaining financial stability at the national level. In short, whether it is a small company or a large country, a holistic view is indispensable to hold financial stability.

5.4 Limitations and Suggestion for Further Studies

This study was limited to sixty-one listed companies which issued *Sukuk* in Malaysia using five aspects of these companies and four properties of *Sukuk*. Therefore, further studies should extend the sample size to include all companies (listed and unlisted) and the relevant variables of *Sukuk*, such as par value of *Sukuk*, types of *Sukuk* and others that would provide more information for better understanding on the relationship between *Sukuk* and financial stability. Besides, other *Sukuk* issuance countries and their financial stability could also be included in further studies.

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APPENDIX

Table A.1: Sample Companies Used in this Study

No.	Sample Companies Listed on Bursa Malaysia	Year of <i>Sukuk</i> been Issued	No. of years issued <i>Sukuk</i>
1	TENAGA NASIONAL BHD [S] (5347)	1997, 2001, 2004, 2013 & 2014	5
2	DRB-HICOM BERHAD [S] (1619)	2005, 2014 & 2015	3
3	IJM CORPORATION BERHAD [S] (3336)	2003, 2007 & 2010	
4	LINGKARAN TRANS KOTA HOLDINGS BERHAD [S] (6645)	2001, 2002 & 2005	
5	MALAKOFF CORPORATION BERHAD [S] (5264)	2001, 2006 & 2017	
6	MALAYSIAN RESOURCES CORPORATION BERHAD [S] (1651)	2001, 2007 & 2008	
7	PLUS EXPRESSWAYS BERHAD (5052)	2002, 2003 & 2005	
8	BOUSTEAD HOLDINGS BERHAD (2771)	2002 & 2003	2
9	KWANTAS CORPORATION BERHAD [S] (6572)	2002 & 2006	
10	LION INDUSTRIES CORPORATION BERHAD [S] (4235)	2005 & 2011	
11	PUNCAK NIAGA HOLDINGS BERHAD [S] (6807)	2000 & 2013	
12	RANHILL HOLDINGS BERHAD [S] (5272)	2004 & 2011	
13	SAPURACREST PETROLEUM BERHAD (8575)	2005 & 2006	
14	SARAWAK ENERGY BERHAD (2356)	2000 & 2001	
15	TH HEAVY ENGINEERING BERHAD [S] (7206)	2013 & 2016	
16	UEM BUILDERS BERHAD (4855)	2000 & 2006	
17	WCT HOLDINGS BERHAD [S] (9679)	2005 & 2008	
18	ZECON BERHAD [S] (7028)	2006 & 2008	
19	ATLAN HOLDINGS BHD. (7048)	2004	1

Table A.1 continued

No.	Sample Companies Listed on Bursa Malaysia	Year of <i>Sukuk</i> been Issued	No. of years issued <i>Sukuk</i>
20	CAHYA MATA SARAWAK BERHAD [S] (2852)	2005	1
21	CEMENT INDUSTRIES OF MALAYSIA BERHAD (2844)	2004	
22	CHEMICAL COMPANY OF MALAYSIA BERHAD [S] (2879)	2011	
23	EDEN INC. BERHAD (7471)	2002	
24	EVERMASTER GROUP BERHAD (7552)	2003	
25	GAMUDA BERHAD [S] (5398)	2002	
26	GLOMAC BERHAD [S] (5020)	2004	
27	HONG LEONG INDUSTRIES BERHAD [S] (3301)	2001	
28	HUBLINE BERHAD (7013)	2005	
29	IJM PLANTATIONS BERHAD [S] (2216)	2003	
30	INGRESS CORPORATION BERHAD [S] (7112)	2004	
31	IRIS CORPORATION BERHAD [S] (0010)	2003	
32	KFC HOLDINGS (MALAYSIA) BERHAD [S] (3492)	2001	
33	KUMPULAN PERANGSANG SELANGOR BERHAD [S] (5843)	2006	
34	MAH SING GROUP BERHAD [S] (8583)	2015	
35	MALAYSIA AIRPORTS HOLDINGS BERHAD (5014)	2003	
36	MALAYSIAN MERCHANT MARINE BERHAD (7040)	2003	
37	MARINE & GENERAL BERHAD [S] (5078)	2008	
38	MAXTRAL INDUSTRY BERHAD (9202)	2006	
39	MEGAN MEDIA HOLDINGS BERHAD (7101)	2005	
40	MMC CORPORATION BERHAD [S] (2194)	2001	
41	MTD INFRAPERDANA BHD (9768)	2001	
42	MUHIKBAH ENGINEERING (M) BHD [S] (5703)	2010	

Table A.1 continued

No.	Sample Companies Listed on Bursa Malaysia	Year of <i>Sukuk</i> been Issued	No. of years issued <i>Sukuk</i>
43	OSK PROPERTY HOLDINGS BERHAD [S] (6661)	2004	1
44	PERAK CORPORATION BERHAD [S] (8346)	2004	
45	PIMPINAN EHSAN BERHAD (5622)	2017	
46	POLYMATE HOLDINGS BERHAD (7846)	2003	
47	POWERTEK BERHAD (6386)	2002	
48	RIMBUNAN SAWIT BERHAD [S] (5113)	2005	
49	S P SETIA BERHAD [S] (8664)	2013	
50	SAPURA ENERGY BERHAD [S] (5218)	2012	
51	SATERAS RESOURCES (MALAYSIA) BERHAD (4278)	2004	
52	SBC CORPORATION BERHAD [S] (5207)	2002	
53	SURIA CAPITAL HOLDINGS BERHAD [S] (6521)	2007	
54	TALAM TRANSFORM BERHAD [S] (2259)	2009	
55	TALIWORKS CORPORATION BERHAD [S] (8524)	2002	
56	TELEKOM MALAYSIA BERHAD [S] (4863)	2007	
57	TH GROUP BERHAD (8109)	2002	
58	TRACOMA HOLDINGS BERHAD (7147)	2005	
59	TRADEWINDS PLANTATION BERHAD [S] (6327)	2007	
60	WHITE HORSE BERHAD [S] (5009)	2001	
61	YTL CEMENT BERHAD (8737)	2001	