

CHAPTER 4

METHODOLOGY

4.1 Introduction

This part presents the research methodology utilized in this study. This study is done to fill the gap concerning three application areas of Sukuk, which are researching the impact of Sukuk announcements on the stock market reaction, the effect of yield spreads of the new and seasoned Sukuk issuance on the stock price volatility and investigating the effect of Sukuk liquidity on the stock market liquidity. The hypothetical foundation of each activity is explained. The exploration data sources, data period, and the sample are also explained. Three methodologies are utilized to respond to this study objectives. The event study technique is used to accomplish the target of the stock market reaction towards the Sukuk issuance announcement. The GARCH (1,1) model is utilized for investigating the new and seasoned Sukuk yield spread co-movement with stock volatility. Meanwhile, the Latent liquidity model is utilized to recognize the determinants of corporate Sukuk liquidity.

4.2 Sukuk Announcement and Stock Market Reaction

4.2.1 Hypotheses Development

Based on the assumptions of the pecking order theory of Myers and Majluf (1984), issuing external financing sends a negative signal to the investors. The pecking order theory of Modigliani and Miller (1963) indicates a negative reaction

from the stock market, which is due to the asymmetric information hypothesis between managers and investors. The argument for this theory, is that investors consider issuing debt by the firms as the second option of financing, which indicates the weak internal financing of the firm. However, studies, such as (Ahmeti & Prenaj, 2015; Brusov, Filatova, Orekhova, & Eskinarov, 2018; Jaros & Bartosova, 2015) found a negative reaction from the stock market due to the financing options available to the firm, which starts from the retaining profits, debt securities, and equity. Hence, when a firm relies on debt securities as a second option to finance its operations, this means the firm has overcome the first option (i.e., retaining earnings).

From another viewpoint, under the trade-off theory, firms will only take action (i.e., issuing new stocks or issuing debt) if they expect benefit from the issuance. These benefits represent the financing its capital, as well as maximizing the stock return of the firm within the stock market. An implication of the theory is that the market reaction to both equity and debt securities will be positive. Based on the above theoretical discussion, the conflict between the pecking order theory and trade-off theory is accompanied by a conflict in the empirical studies, as some of the previous empirical studies found a negative and significant abnormal return from the stock market towards Sukuk announcements, such as Khartabiel et al. (2019); Mohamed et al. (2017); N Ahmad and Rahim (2012); Godlewski, Turk-Ariss, and Weill (2013).

Meanwhile other previous empirical studies, such as Ashhari (2009); Elian and Young Taft (2014); Rahim and Ahmad (2015), found that Sukuk issuance announcements are associated with a positive abnormal return of stock. The positive reaction from the stock is explained as the exceeded demand for the Sukuk instrument.

According to Culata and Gunarsih (2012), most of the financing theories including the trade-off theory, focus on the developed stock market. Within this market

the investors bear prosperous horizons towards investment, which is due to the strong economic condition of the stock market, as well as the advanced regulations that organize the stock market mechanism, and the information transparency flow from firms to the stock market. However, for the case of stock markets in developing regions, such as the GCC and Southeast Asia, investors have less confidence in two things. First, the overall economic condition, which is due to the successive economic and financial crises over the last two decades, the 1997 Asian financial crisis and the 2007-2009 global financial crisis, and the sharp decline in global oil prices 2014-2019, where the developed stock market overcome these crises faster compared to the emerging stock markets. Second, the weak corporate governance regulations, either the weak accounting transparency in Southeast Asia (Lim, 2017) or the partial implementation of corporate governance code in the GCC (Swedan & Ahmed, 2019).

Unlike the previous empirical studies that limited their scope of the investigation to the domestic stock market or one region, this study widens the scope to cover two regions – Southeast Asia and the GCC. Hence, in the case of a slowdown in the economy in Asia (Hong, Lee, Liao, & Seneviratne, 2017; Otsuka, Higuchi, & Sonobe, 2017) and in the GCC (Devarajan & Mottaghi, 2017), it is expected to lead to a negative abnormal return. The hypothesis to be tested is as follows:

Hypothesis 1: Sukuk announcements in Southeast Asia and GCC stock markets are associated with a negative abnormal return.

Based on the market imperfections theory, there are three criteria that can be distinguished in the imperfect capital market: agency cost, information asymmetries, and transaction cost (Koo & Maeng, 2005; Oliner & Rudebusch, 1992). Along with the imperfection theory assumptions, deciding which stock market (i.e., Southeast Asia or

GCC) has the lower degree of structure consistency, can be linked to a higher reaction to global economic shocks.

According to Goldstein and Pauzner (2004), different countries sharing the same group of investors leads to the transmission of negative shocks from one part of the world to another. Thus, the realization of a financial crisis in one country can induce a crisis in other countries as well. This generates a positive correlation between the returns on investments in different countries and thus reduces the effectiveness of diversifying investments across countries. Tsaurai (2018) investigated the determinants of the stock market structure in emerging markets. For the Southeast Asia stock market, factors such as macroeconomic stability, stock market liquidity, savings, financial development, and income growth rate positively influenced stock market development. Meanwhile, for the GCC countries, stock market liquidity, savings and financial intermediary were the three variables that were found to have a significant positive impact on stock market development in the GCC region. The findings of Tsaurai (2018) confirmed that the Southeast Asia stock market is better developed than the GCC stock market. According to Souza and Aste (2019) a better developed stock market reflects a better structure, which leads to better relevant information flow, and provides a higher quality of financial information disclosure.

In a comparison between the GCC and Southeast Asia market, the Southeast Asia market has the greatest number of outlook revisions and credit ratings compared to other regions (Christopher et al., 2012). This is because the Asian region contains a larger number of and more disparate 'emerging' countries than the other geographical regions.

Thus, the second hypothesis is:

Hypothesis 2: Announcements of Sukuk in the Southeast Asia market are associated with lower negative abnormal returns compared to the GCC Sukuk market.

Under the efficient capital market hypothesis, Malkiel and Fama (1970) applied the concept of rational expectations to financial markets and hypothesized that financial prices contained all the available information. At least, it should not be possible to use past prices to predict future prices, and, at best, there would be no difference between the market prices and the fair prices of financial assets. The work of Grossman and Stiglitz (1980) underlines the failure of the efficient capital markets hypothesis. The general argument is as follows: if an investor starts from the assumption that information is expensive and markets are efficient, then no investor will have an incentive to incur the cost of information. It will be more profitable and, therefore, rational behaviour, to wait for prices to reflect all the available information, including information that is expensive. Investors will not have to wait long in any case, because the efficient capital market hypothesis guarantees that this information is incorporated in the price instantly.

Fung and Rudd (1986) concluded that there is a time difference between receiving the information by investors and their response to the financial information. This time difference relies on many factors, which are not limited to the information transparency of the announcement and asset liquidity. Hence, investors take the time difference between the announcement date and actual date of debt issuance to utilize related information to the announcement, issuance, and financial position of the issuer. This time-lapse varies among investors due to their ability to access this information, besides receiving updated amendments that occur on the announcement prospectus. Unlike the efficient capital market hypothesis, and in agreement with the conclusion of Fung and Rudd (1986), the under-reaction theory of Stein (1992) assumes that the capital market is not efficient enough to provide all the relevant information to the assets instantly.

Hence, investors take time to reach the optimal level of information; this time enables

investors to make decisions. In this case, the insignificant reaction is a temporary situation, and investors will seek to extract the related information to the bond price data as soon as possible, which will lead to a significant reaction from the stock market.

The empirical evidence of Ashhari et al. (2009) tested a time period of -30 days prior to the announcement date and +30 days post the announcement date. Ashhari et al. (2009) found significantly positive abnormal returns one day before the issuance of Sukuk at window (-1, +1), (-7,0), and (-7, +7). This could be interpreted under the assumption of the under-reaction theory, which considers a positive market reaction whenever it is away from the announcement day. In considering that the market takes time to extract the relevant information of the issuance, by way of further empirical support, within a time period of -30 days prior to the announcement date and +30 days post the announcement date, Alam et al. (2013) noted that there is a better abnormal return from the stock market whenever the market gets more time to extract the announcement information. The result of Alam et al. (2013) shows a less significant and positive impact in window (-5, -1) with a CAAR of 0.261, compared to 0.701 for window (-1, 1). Hence, based on the under-reaction assumptions documented by Stein (1992), and the previous empirical evidence of Ashhari et al. (2009) and Alam et al. (2013), the third hypothesis is as follows:

Hypothesis 3: Announcements of Sukuk that have a longer time-lapse are associated with higher abnormal returns.

4.2.2 Data Selection

4.2.2.1 Sukuk Announcement

The announcement dates were sourced from the Thomson Reuters Eikon 4.0, from Q1/2001 to Q3/2016; selecting this range of data is to balance between the period prior and post the global financial crisis, which helps to reduce the variation effect resulted from the economic recession over the global financial crisis.

The announcement dates were obtained from the same source. For estimating market beta, the estimation period for the market model is 171 days, starting at day 180 until day ten before the announcement date (-180, -10). The estimation period for the market model is 171 days, starting at day 180 until day ten before the announcement date (-180, -10), taking into consideration the off-trading days that are probably equal to a minimum of 48 days during six months. The estimation period between 150 to 30 days earlier than the announcement day gives similar results (Godlewski et al., 2013). The test period is assigned from five days before the announcement until 15 days after the announcement date (-5, +15); five certain event windows have been assigned over this period. Following Godlewski, Turk-Ariss, Weill (2013), and Maskara and Mullineaux (2011) three symmetric event windows (0,0), (-1,1), (-2,2), and two asymmetric event windows (-1,2), (-2,1). As more time is needed by the investors to be more familiar with the issuance of security (Anderson, 2017), seven more event windows are added to cover two weeks later from the date of issuance, which is (-5,+4), (-5,+15), (-1,+14), (0,3), (-1,+5), (0,+12), (0,+7). The packaged announcements will be removed from the issuance announcements; the main purpose behind that is to avoid the side effects of the associated announcements, such as dividends, earnings, acquiring, and merging.

The thesis sample will focus on the corporate Sukuk issuance announcements during the period (Q1/2001 to Q3/2016). The list of corporate Sukuk issuance announcements will be downloaded from the Thomson Reuters Eikon 4.0. According to Student (1992) and De Winter (2013) a sample size can be substantially small if the assumptions hold.

Furthermore, announcement dates will be verified through the published base from Eikon and the security market indexes, and the selected data criteria will be subjected to the following conditions:

1. The corporate issuer must be listed in the security market to enable the company stock calculation during the estimation period.
2. Announcement date is identifiable clearly and accurately.
3. Debt maturity must be above one year (to avoid the short-term debt issuances).
4. Sukuk issuance must be active (non-matured) to avoid the matured issuances noisy information.
5. For the perpetual Sukuk, the next call date is assigned to determine the Sukuk tenor.

4.2.2.2 Stock Market Return

The data for stock market return will be retrieved from Thomson Reuters Eikon 4.0. Table 4.1 shows the list of five stock market indices that used by this study to test the first objective, that stock market reaction toward Sukuk announcement. The stock market return retrieved is based on daily data, for computing the actual return of stock market index; the natural log of stock market index close and open price is computed.

Table 4.1: List of Indexes Covered by This Study

No	Stock Market Scope	Index Symbol
1	Malaysian stock market	KLCI
2	Indonesian security market	JKSE
3	Saudi security market	TASI
4	Qatar security market	DSM
5	United Arab Emirates security market	ADSMI

4.2.2.3 Dependent variable

The five-day cumulative abnormal returns of the event window (-2, +2) are used in this study as the dependent variable. While the event date or announcement date is defined as $t=0$, taking two days before and after the announcement date allows for any possibility of a news leakage or delay.

4.2.2.4 Explanatory Factors

4.2.2.4.1 Time-lapse

Time-lapse refers to the difference of time between the issuance announcement of Sukuk and the actual date of issuance Sukuk. The time-lapse is calculated based on a daily basis. Time-lapse is employed by this study to fill the gap resulted from ignoring the test of this variable in the Sukuk market. The nomination of this variable is based on the market timing theory that considers the time factor as one of the crucial factors upon capital structure decision. Hypothetically, this factor is expected to be found with a significant positive impact on the cumulative abnormal return of the stock market.

4.2.2.4.2 Amount of issuance

Amount of issuance is used as a proxy for the size of Sukuk issuance value. The amount of issuance is retrieved based on the value announced within the Sukuk issuance prospectus. The unit of measurement for this variable is the monetary unit, where all the amount of issuance converted to USD dollar from the main currency of issuance.

4.2.2.4.3 Coupon rate

The coupon rate is employed by this study as a proxy for the yield paid by Sukuk issuer to the Sukuk holder. The coupon rate type that dominated in Sukuk market is the plain vanilla-fixed coupon. This type of coupon rate is considered as the simplest type of fixed income instrument yield. The unit measurement for this variable is percentage.

4.2.2.4.4 Tenor

The Sukuk tenor defines as the period during which its Sukuk holder will receive profit payments from the Sukuk. When the Sukuk reaches maturity, the Sukuk holder is repaid its principal value. The unit measurement for this variable is years. The tenor is calculated in term of years from the issuance of Sukuk to the maturity date of Sukuk.

4.2.2.4.5 Market Capitalization

Market capitalization refers to the total assets of the issuer as reported within the Sukuk issuance prospectus. The market capitalization is calculated based on a monetary unit. All the amount of market capitalization converted to the USD from the main currency of Sukuk issuer.

4.2.3 Methodology

Two methodologies are used for this thesis section. First, the event study methodology is applied for the first and third hypotheses; the event study methodology is used to examine the stock return behaviour around a financial, accounting, political, social, or economic event. This methodology was introduced by Fama, Fisher, Jensen, and Roll (1969) and is still widely used. This methodology is employed in this thesis for the first hypothesis to investigate the stock return reaction towards the Sukuk issuance announcements in Southeast Asia and GCC stock markets, and for the third hypothesis to investigate if a Sukuk announcement in the Southeast Asia market is associated with better abnormal returns compared to the GCC Sukuk market. Second, the multivariate regression method was used to provide a better explanation about the estimation of each factor (time-lapse, capital market, as well as tenor, amount of issuance, and coupon rate) within the construct to the accumulative abnormal return of the stock market return. This interpretation clarifies that most factors contribute significantly to the cumulative average abnormal return of the stock market.

4.2.3.1 Market Reaction Model (Hypothesis 1)

The market reaction model is used to examine the first hypothesis, as follows:

Hypothesis 1: Sukuk announcements in Southeast Asia and GCC stock markets are associated with a negative abnormal return.

In determining the assigned event windows of the Sukuk announcement, previous studies were divided into two categories. The first category preferred to investigate the stock market reaction in the short term horizon, which extends from 0 to 7 days around the announcement date; these studies, such as (Ahmad & Rusgianto, 2013a; Alam et al.,

2013; Ashhari, 2009; Godlewski et al., 2013; Modirzadehbami & Mansourfar, 2011), attribute this to avoid the effect of other announcements on stock market reaction, such as dividends, CEO turnover, equity issuance, conventional bond announcement, and so on (Godlewski et al., 2013). Meanwhile, the second category studies preferred to investigate the stock market reaction in the long-term horizon, which extend from 0 to 60 days around the announcement date; these studies, such as (Ahmad & Rahim, 2014; Ibrahim & Minai, 2009; Mohamed et al., 2017), attribute this to capture the information leakage by investors.

The market reaction model, as defined below, will be used to find the expected return of each issue; as given in Equation (4.1):

$$R_{it} = \alpha_i + \beta_{it} + e$$

(4.1)

where:

R_{it} = stock return (i) at period (t)

R_{mt} = return of the market

α_i = alpha or the intercept of the bond (i)

β_i = beta or the slope of the bond (i)

e_i = the error term of bond (i) in period (t)

For the market index benchmark, five market index benchmarks will be used to measure the abnormal return from each country securities market. Hence, the Bursa Malaysia FBMKLCI index will be used as an indicator of the market return, JKSE index for the Indonesian security market, TASI index for Saudi security market, DSM Index for the Qatar security market, and the ADSMI index for the United Arab Emirates

security market. Calculating the abnormal return is straightforward. Initially, the return on a security is regressed against the market index to get the beta as well as the alpha. For computing the actual return of the stock market index; the natural log of stock close and open price is computed as given in Equation (4.2):

$$\log \frac{P_t - P_{t-1}}{P_{t-1}}$$

(4.2)

where:

P_t = the daily closing stock price at time t

p_{t-1} = the daily opening stock price at time t-1

Then, to find the abnormal or excess return, the difference between the actual return on the security (as computed with the natural log of stock close and open price) and expected return from the market model is computed as given in Equation (4.3):

$$AR_{it} = R_{it} - (a_i + \beta_i R_{mt})$$

(4.3)

where:

AR_{it} = average return for a firm (i) at period (t)

R_{it} = actual returns for a firm (i) at the time period (t)

a_i = the constant average returns of a stock (i)

R_{mt} = return of the market

β_i = estimated beta value for bond (i)

The average abnormal return is computed by dividing the abnormal return by the number of announcements; as given in Equation (4.4):

$$AAR_t = \frac{\sum_{i=1}^n AR_{i,t}}{n}$$

(4.4)

The AAR_t is an estimated average deviation percentage of stock return samples of the normal relationship to the market. The standard deviation of the AAR of the estimated window will be calculated as well to test and analyse whether the Average Abnormal Returns (AAR) are statistically different from zero; as given in Equation (4.5):

$$t - test = \frac{AAR_t}{\alpha(AAR)}$$

(4.5)

where:

AAR = represents average abnormal return across bonds in the sample

$\alpha(AAR)$ = is the standard deviation for average abnormal return for all bonds in the sample calculated during the estimation period

The t-statistic for the cumulative average abnormal return (CAAR) is slightly different from the above. It is calculated by dividing CAAR by the square root of the number of days in the event window multiplied by the estimated standard deviation.

To observe the cumulative effects, the cumulative abnormal returns (Kocaarslan, Soytaş, Sari, & Ugurlu, 2019) will be computed by summing up the AAR_t over various time periods of interest about the event period; as given in Equation (4.6):

$$CAAR_{t_1,t_2} = \sum_{t_2}^{t_1} AAR$$

(4.6)

CAAR_t is a more precise representation of the longer-term effect on share prices from bond offering announcements. The t-value for the CAAR_t is given as in Equation

(4.7):

$$t - statistics = \frac{CAAR}{\alpha(CAAR)_t}$$

(4.7)

The standard deviation of CAAR is given in Equation 4.8:

$$\alpha(CAAR)_t = \alpha(AAR)\sqrt{N}$$

(4.8)

where N is the number of days in the CAAR estimation.

4.2.3.1.1 Hypothesis 1 Confirmation

The alternative hypothesis of CAAR is confirmed statistically in the case of the t-test value being higher than 1.96, which indicates that the significant abnormal return from the stock market over the tested period was impacted by the Sukuk issuance announcement.

4.2.3.2 Variance Analysis Tests (Hypotheses 2)

For the purpose of investigating the second hypothesis, which assumes better abnormal returns of the Southeast Asia stock market to Sukuk announcements

compared to the GCC stock market, the independent sample t-test and one-way ANOVA are used to examine the second hypothesis as follows:

Hypothesis 2: Announcements of Sukuk in the Southeast Asia market are associated with lower negative abnormal returns compared to the GCC Sukuk market.

4.2.3.2.1 Independent Sample t-test

The independent sample t-test is constructed to test the difference between two groups; applying this test for the second hypotheses is constructed to test whether there is a significant difference between the abnormal returns gained by the Southeast Asia stock market and abnormal returns gained by the GCC stock market. To proceed with conducting the independent sample t-test, seven steps are required to finalize the procedures, as follows:

1. Define the null and alternative hypotheses of the test
2. Determine the alpha value
3. Calculation of the degree of freedom
4. Testing the normality assumption
5. Testing procedure

Defining the null and alternative hypotheses for testing the difference between the stock markets (i.e., Southeast Asia and GCC) in terms of abnormal returns to Sukuk announcement as follows:

$$H_0; \mu \text{ Southeast Asia} = \mu \text{ GCC}$$

$$H_1; \mu \text{ Southeast Asia} \neq \mu \text{ GCC}$$

The null hypothesis assumes no significant difference between the abnormal returns gained from the Sukuk announcement for both stock markets (i.e., Southeast Asia and GCC), while the alternative hypothesis assumes a significant difference

between the abnormal returns gained from the Sukuk announcements for both stock markets (i.e., Southeast Asia and GCC).

To ensure the statistical validity of the t-test, computing the degree of freedom is calculated as in Equation (4.9):

$$df = (n_{SA} - 1) + (n_{GCC} - 1) \quad (4.9)$$

where:

n_{SA} = total observations of Southeast Asia

n_{GCC} = total observations of GCC

Before proceeding to examine the t-test, the normality assumption must be conducted to confirm the data are normally distributed. Two measurements are used to test the normality (Groeneveld and Meeden (1984) – Skewness and Kurtosis – as shown in Equation (4.10):

$$\text{Skewness} = \frac{\sum_i^N (x_i - \bar{x})^3}{(N-1) \cdot \sigma^3} \quad (4.10)$$

where:

N = observations

x_i = mean of the observations' value

\bar{x} = mode of the observations' value

σ = standard deviation

$$\text{Kurtosis} = n * \frac{\sum_i^n (Y_i - \bar{Y})^4}{\sum_i^n (Y_i - \bar{Y})^2}$$

(4.11)

where:

n = observations

Y_i = variable of the distribution

\bar{Y} = mean of the observations' value

4.2.3.2.2 One-way ANOVA

One-way ANOVA tests are designed to test the difference between two or more groups in terms of mean. Applying this test for the second hypothesis aims to test the difference in the abnormal returns among five stock markets: Malaysia, Indonesia, Saudi Arabia, the United Arab Emirates, and Qatar. Equation (4.12) illustrates the numerical formula used to conduct the test:

$$F = \frac{MST}{MSE}$$

(4.12)

where:

F = the variance ratio for the overall test

MST = the mean square due to treatments/groups (between groups)

MSE = the mean square due to error (within groups, residual mean square)

Retrieving MST and MSE calculations are based on Equation (4.13) and Equation (4.14), respectively, as follows:

$$MST = \frac{\sum_{i=1}^k (T_i^2/n_i) - G^2/n}{k - 1}$$

(4.13)

$$MSE = \frac{\sum_{i=1}^k \sum_{j=1}^{n_i} Y_{ij}^2 - \sum_{i=1}^k (T_i^2/n_i)}{n - k}$$

(4.14)

where:

Y_{ij} = is an observation

T_i = is the group total

G = is the grand total of all observations

n_i = is the number in the group

i and n = is the total number of observations

The differences between groups, the post-hoc Tukey HSD test is used in Equation (4.15):

$$HSD = \frac{M_1 - M_2}{\sqrt{MS_w \left[\frac{1}{n} \right]}}$$

(4.15)

where:

HSD = honestly significance difference

M_1 = mean value 1

M_2 = mean value 2

MS_w = mean square width

n = number per mean

4.2.3.2.3 Hypothesis 2 Confirmation

The alternative hypothesis will be confirmed by a comparison of the descriptive statistics, the cumulative average abnormal return for both stock markets – Southeast Asia and GCC – as discussed within the hypothesis development. The cumulative average abnormal return of the Southeast Asia stock market is higher than the cumulative average abnormal return of the GCC stock market.

4.2.3.3 Regression Test (Hypothesis 3)

The multivariate regression method is used to examine the third hypothesis as follows:

Hypothesis 3: Announcements of Sukuk that have a longer time-lapse are associated with higher abnormal returns.

Multivariate regression was used to provide a better explanation about the estimation of each factor (time-lapse, capital market, and as well as tenor, amount of issuance, and coupon rate) within the construct to the accumulative abnormal return of the stock market. This additional interpretation clarifies the factors that contribute most to the abnormal return.

Each issuance of bonds, whether conventional or Islamic, can be differentiated from other issuances based on the internal and external characteristics; internal characteristics are mostly relevant to the issuer decision for designing the issuance structure. These characteristics can be determined, such as tenor, coupon rate, maturity, the purpose of issuing, announcement and issuing date, issuance amount, issuance grade, and Sukuk price. While the external characteristics are mostly relevant in terms of ungoverned decisions from the issuer, such as issuance rating and risk classification

of the region, or characteristics that are related to the economic condition, such as inflation, tax, government constraints, investment opportunities, economic growth, and debt market development. Most of these characteristics have been highlighted by several studies that strived to interpret the guided characteristic or group of characteristics that can impact the stock prices within the assigned event windows.

For the purpose of predicting the leading stock reaction trends, linear regression is performed using the model defined in Equation (4.16):

$$CAAR_{t_1,t_2} = C + lapse_{it} + Cap_{it} + Tenor_{it} + Am_{it} + Cp_{it} + e_{it} \quad (4.16)$$

where:

C = model intercept

$CAAR$ = cumulative abnormal return over the event window t_1 and t_2

$Lapse$ = the interval time between announcement and the actual date of issuance

Cap = market value for all relevant issue-level share types

$Tenor$ = accrual issuance period

Am = amount of issuance

Cp = coupon rate

e = error term

4.2.3.3.1 Hypothesis 3 Confirmation

The alternative hypothesis of the ordinary least squares test is confirmed statistically in the case of t-test values higher than 1.96 and a significance level less than 5%, which indicates a significant predicting of the independent factors to the cumulative average abnormal return of the stock market.

This study employs the Generalized Method of Moments (GMM) to assure the result obtained. Regarding the absence of causal effects in the previous literature, such as Khartabiel, Abu-Alkheil, Ahmad, and Khan (2019), Mohamed, Yahya, and Ishak (2017), and Godlewski, Turk-Ariss, and Weill (2013), it is estimated with an econometric technique of dynamic panels, as is the case of GMM, with the objective of obtain consistent and efficient estimators. Because GMM exploits the time series variation of the data, controls for country-specific unobservable effects, allows the inclusion of lags of the dependent variable as regressors, and controls for the endogeneity of the explanatory variables. Generalized Method of Moments developed for dynamic panel data models is used, which was introduced by Holtz-Eakin, Newey, and Rosen (1988), Arellano and Bond (1991) and Arellano and Bover (1995). Taking advantage of the nature of the panel data, these estimators are based, first, on regressions in differences and / or instruments to control for unobservable effects and, second, on the use of previous observations of explanatory variables and of the variable dependent lagged as instruments, which are called internal instruments. The GMM estimator based on these conditions is known as the difference estimator. Despite its advantages over simpler panel data estimators, there are significant statistical shortcomings with the difference estimator. Alonso-Borrego and Arellano (1999) and Blundell and Bond (1998) show that when the explanatory variables are persistent over time, the lagged levels of these variables are weak instruments for the difference regression equation. The weakness of the instrument influences the asymptotic and small-sample performance of the difference estimator. Asymptotically, the variance of the coefficients increases. In small samples, Monte Carlo experiments show that weak instruments can produce skewed coefficients. To reduce the potential biases and imprecision associated with the usual difference estimator, the GMM-system estimator

is used, which combines in a system the regression in differences with the regression in levels. The instruments for the regression in differences are the same as the previous ones. The instruments for regression in levels are the lagged differences of the corresponding variables.

4.3 New Sukuk Issuance Yield Spread and Stock Price Volatility

4.3.1 Hypotheses Development

Elton, Gruber, Agrawal, and Mann (2001) defined corporate bond yield spreads as “the difference between the yield to maturity on a corporate bond (or an index of corporate bonds) and the yield to maturity on a government bond (or an index of government bonds) of the same maturity.” Simkovic and Kaminitzky (2011) defined corporate bond yield spreads as the difference in yields of two bonds that vary in risk structure and have the same maturity and coupon rate. The riskless structure of bonds for Simkovic and Kaminitzky (2011) refers to sovereign bonds. Minxia Chen (2017) defined Sukuk yield spreads based on the difference between Sukuk yield and government yield, Minxia Chen (2017) confirmed a yield spread between Sukuk and conventional government bonds; in the study of Minxia Chen (2017), the Sukuk yield spread was consistently higher than the conventional bond yield spread.

Issuing new bonds is associated with several costs to the firm. These can be categorized into two groups: the cost of debt and the cost of the issuing transaction. The transaction cost of issuing new debt is inherently different to the previous issuances, as the issuer gains experience from the first issuance, which enables them to adopt an alternative strategy for delivering debt to the market (Fung & Rudd, 1986). In this case, investors have earned a better understanding from the seasoned issuances, which leads to an increase in the yield spreads of the new issuances (Goldstein & Hotchkiss, 2007).

Conard and Frankena (1969) attribute the yield spreads to the different determinants of the new and seasoned bond issuance. The spread on individual new issues tends to disappear within two or three months after the issue is released from syndicate price-maintenance agreements, thereby indicating that the spread remaining after correction for coupon rate differences is not due to systematic differences in other yield-determining characteristics. According to the assumption of Conard and Frankena (1969), if underwriters anticipate a rise in yields and a fall in bond prices, they will be reluctant to hold new issues for fear of suffering capital losses. In order to ensure that new issues would sell quickly, underwriters could be expected to increase their yield of the new issues, thus increasing the new-seasoned yield spread. If rising yields in the recent past generate fear on the part of underwriters that yields will continue to rise in the near future, the expectation may cause new-seasoned spreads to increase. This would explain the positive correlation of the change-in-yield variables with the spread. It follows that the explanatory power of the change-in-yield variables might be interpreted as support for the hypothesis that the new issue spread remaining after correction for coupon differences is due to the pricing policies of the underwriters distributing new issues. The new Sukuk issuance takes time to be corrected according to the investors' expectations towards the future profit of this issuance, thereby indicating that the spread will remain after correction unless the information conflict becomes narrower. Therefore, the fourth hypothesis is as follows:

Hypothesis 4: New Sukuk yield is associated with higher spread compared to the seasoned Sukuk yield spread.

The efficient market theory of Malkiel and Fama (1970) stated that all bond prices should fully reflect the available information, and thus identical bonds should sell at the

same yield. This does not appear to be the case during periods of rising yields, when future changes in seasoned yields can, in part, be predicted by past changes in new issue yields. The cause of this imperfection appears to be the nominal (as opposed to real) prices of seasoned bonds.

Based on the conclusion of Kozhanov and Ogden (2012) that documented a negative yield spread between the new investment-grade bond and the seasoned yield benchmark, attributing the lower yield from the new bond issue to the liquidity issues suggests that new bond issues have higher liquidity than the seasoned bonds. Volatility has the opposite effect on stock and bond prices. The volatility of the stock market hurts bondholders because it increases the probability of default but has a corresponding positive effect on equity holders. The volatility should drive up yields on both new and seasoned corporate bonds. Merton (1974) initiated the modern analysis of corporate debt by pointing out that the holders of risky corporate bonds can be thought of as owners of riskless bonds who have issued put options to the holders of the firm equity. When volatility increases, the value of the put options increases in return, benefiting equity holders at the expense of bondholders. The volatility that is relevant for option value, and thus for corporate debt, is total firm volatility, including both idiosyncratic volatility and systematic or market-wide volatility. This is important because idiosyncratic volatility can move very differently from market-wide volatility. In particular, Campbell, Lettau, Malkiel, and Xu (2001) pointed out that idiosyncratic volatility has undergone temporary fluctuations, but no trend increase. The finding of Campbell et al. (2001) suggests that increasing idiosyncratic volatility could depress corporate bond prices and support corporate equity prices.

In the case of Sukuk, Naifar and Mseddi (2013) identified two sources that affect the yield spread of Sukuk, first, the stock market conditions that are represented by the

stock return volatility and stock index return, and second, the macroeconomic variables that are represented by the yield curve slope of Sukuk and the inflation rate. In a later study, Naifar (2016) found a symmetric dependence between Sukuk yield spread and stock market volatility, which confirms a co-movement between the yield spread of Sukuk and the stock market volatility in the Saudi stock market. Aloui, Hammoudeh, and ben Hamida (2015) investigated the volatility spill-overs between three global Sukuk indexes: Dubai GCC Global Sukuk index (GSKI), the Dubai GCC corporate Sukuk index (GSKC), the Dubai GCC financial services Sukuk index (GSKF), and the GCC Shari'ah stock index. Their study found a significant and negative interactive linkage between the global Sukuk volatility and Shari'ah stock volatility. Accordingly, the fifth and sixth hypotheses are as follows:

Hypothesis 5: New Sukuk yield spread is associated with higher negative influence on the stock market volatility.

Hypothesis 6: Seasoned Sukuk yield spread is associated with lower negative influence on the stock market volatility.

4.3.2 Data Selection

As a reminder, the purpose of this study section is to identify the impact of the yield spread of the seasoned and new Sukuk issuance on the stock market volatility; the issuance data are the Sukuk issuances from two markets (Malaysia and Indonesia). The yield spread is the daily data from June 2014 to December 2016.

The documented results of Pedrosa (1998) estimated the affected changes in the credit spreads by economic variables, such as changing business climate, inflation, interest rate, and so forth. In line with the economic determinants, the significant co-movement of the exchange rate in Asian countries (Hussain, Zebende, Bashir, &

Donghong, 2017) designates the exchange rate as the sole economic factor within the model. The exchange rate has been tested as a macroeconomic factor in several studies, such as Mutuku and Ng'eny (2014), and Kibria et al. (2014), who found a significant and positive impact from the exchange rate on the stock market volatility. The Malaysian ringgit and Indonesian rupiah depreciated significantly against the USD starting from late 2014 (Chow, Muhammad, Noordin, & Cheng, 2017; Sankarkumar, Selvam, Maniam, & Sigo, 2017). In this study, the USD is used as a proxy for the exchange rate, as the USD is the most dominant currency for global trading (Lee, 2014), and the local currency changes (Malaysian ringgit and Indonesian rupiah) against the USD dollar.

To overcome the unsuitableness of some of the Sukuk constructions to be measured by the established model of the conventional bond, the suitable Sukuk structures that are able to be measured are those that have yield curves close to the conventional bond yield curve. Since the sample is limited to three structures of Sukuk – Al-Ijarah, Murabaha, and Al-Musharakah – they can be estimated by using the applied estimating of the conventional bond. The data were retrieved from the Thomson database Eikon 0.4.

4.3.3 Empirical Model Methodology

4.3.3.1 Fourth Hypothesis

For testing the fourth hypothesis that aims to identify that the new Sukuk yield is associated with higher spread compared to the seasoned Sukuk yield spread, the Levene test (Homogeneity of variances) is used to test the variance equality for both the new and seasoned Sukuk yield spreads. To confirm, the Levene test is performed to compare

means of Homogeneity of variances states, the null and alternative hypotheses are constructed as follows:

H0: There are no significant differences between the variances of new and seasoned Sukuk yield spreads.

H1: There are significant differences between the variances of new and seasoned Sukuk yield spreads.

The Levene formula is used as shown in the Equation (4.17):

$$W = \frac{(N - K) \sum_{i=1}^k N_i (\bar{Z}_i - \bar{Z}_.)^2}{(K - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - \bar{Z}_i)^2}$$

(4.17)

where:

$$Z_{ij} = |Y_{ij} - \bar{Y}_i|$$

As Y_{ij} the subgroup and \bar{Y}_i the mean of the subgroup

N = sample size

K = subgroups

4.3.3.2 Fifth and Sixth Hypotheses

Volatility is an inherent characteristic of financial time series. In general, it is not constant, and consequently traditional time series models that assume homoscedastic variance are not suitable for modeling financial time series. Engle (1982) introduces a new class of stochastic processes called ARCH models, in which the variance conditional on past information is not constant, and depends on the square of past innovations. Engle and Bollerslev (1986) generalize the ARCH models by proposing

the GARCH models in which the conditional variance depends not only on the squares of the disturbances, as in Engle (1982) model, but also on the conditional variances of previous periods. Nelson (1991) introduced the EGARCH models, in which he formulates a model for the conditional variance that does not behave symmetrically for positive and negative disturbances, as happens in GARCH models; expressing another feature of volatility: its asymmetric behavior in the face of rises and falls in the prices of a financial asset.

Volatility is defined as the conditional variance of the underlying series. In the case of financial time series, the volatility of returns is modelled. It should be noted that, although the series is stationary and has, therefore, constant variance, it can present short-term oscillations, which is what the conditional variance collects for the study of volatility, the knowledge of which is of interest, in particular, to make short-term predictions. As volatility varies over time, classical time series models are not suitable for modelling it since one of their assumptions is that the variance is constant.

Volatility is not directly observable; for one day, for example, there is only one observation. In the financial series, there are long periods of high volatility followed by periods of low volatility, which indicates the presence of heteroscedasticity. The means and variances conditional on past information (short-term forecasts) are more interesting than the unconditional means and variances (long-term forecasts). A good model for volatility must have the ability to forecast it; therefore, it must model its characteristics. In general, this class of models is used to make projections and estimates, for example, forecasting the absolute value of the magnitude of the returns of the prices of an asset, estimating quintiles or even the entire probability density function of the returns. A good model for return volatility should reflect the five following characteristics (Engle & Patton, 2001):

1. Clustering of volatility

Volatility tends to appear grouped by periods, that is, volatility can be high during one period and low during another. Big changes in volatility are followed by big changes; small changes follow small volatility changes. This behavior has been reported in numerous studies, such as Baillie, Bollerslev, and Mikkelsen (1996), Chou (1988), and Schwert (1989). The clustering of volatility is due to the fact that today's shocks influence the expected value of volatility several periods in the future.

2. Reversion to the mean

The clustering of volatility implies that a period of high volatility will eventually be followed by a period of normal volatility, and a period of low volatility will be followed by a period of higher volatility. Volatility tends to revert to the mean, in other words, there is a normal level of volatility to which it eventually returns. Long-term forecasts will all converge to the normal level of volatility, regardless of when they were made.

3. Volatility is asymmetric

Volatility behaves differently against positive and negative innovations. It does not react in the same way to a large rise in the price of an asset as to a drop in its price. Several of the models impose the assumption that the conditional variance is affected symmetrically by positive and negative innovations, for example, in an ARCH model, the variance depends on the square of the lagged innovations, ignoring this asymmetry effect. This asymmetry is called the leverage effect and has been modeled, among others,

by the EGARCHs. Evidence of this effect has been found by Nelson (1991), Glosten, Jagannathan, and Runkle (1993), and Engle and Ng (1993).

4. Influence of exogenous variables

Obviously, no one considers that the prices of financial assets evolve independently of the markets around them and, therefore, it would be expected that there are variables that contain relevant information for the volatility of the series. This has been treated by Bollerslev and Melvin (1994), Engle, Joseph (1996), and Engle, Ito, and Lin (1990), finding that exogenous variables can influence volatility.

Furthermore, it is possible that deterministic events also have an impact on the volatility of the series. Examples of such events can be the periodic reports of a company, the new macroeconomic policies. For example, Andersen and Bollerslev (1998) found that the volatility of the dollar exchange rate, against the German mark, increased notably at the time when new macroeconomic information from the United States, such as the Employment Report, was published or the Production Price Index.

5. Probability distribution

The probability distribution of the returns has heavy tails and, in general, excess kurtosis.

Several theoretical and empirical pieces of research that investigate the bond spread behaviour have employed various methodologies. The study of Longstaff and Schwartz (1995) is from the initial studies that investigated the debt spread by adopting the ordinary least squares (OLS), which shows the effect of the interest rate and firm value on the bond spread changes. Later on, the proposed simple approach of Longstaff

& Schwartz (1995) was expanded to include the macroeconomic factors that inflation and interest rate tested by Collin-Dufresne, Goldstein, & Martin (2001). To overcome the heteroscedasticity that resulted from the unequal variance of the error term, Manzoni (2002) applied the generalized autoregressive conditional heteroscedasticity (Rahman, Omar, & Kassim, 2015). Hence, this study will adopt the GARCH (1,1) methodology of Bollerslev (1986) is used to improve the computed prediction of the error term variance, and also to correct the least squares deficiencies. The GARCH (1, 1) used to explain whether or not there is a difference in the co-movement between the seasoned and new Sukuk yield spread with stock market volatility.

The comparison of the ARCH family models, as they are not nested, is done by means of the sum of squares of the errors, Schwarz Information Criteria (SIC) = $\sum e'e$, where e is the vector of errors or residuals, selecting the model with the lowest SIC.

The examination model will be conducted through two stages. Firstly, the unit root test based on Augmented Dickey-Fuller will be used to ensure that the data are fit to be applied to the selected model as well as to ensure that the nominated variables are stationary in the level form, and that the variables are stationary in a different form. Second, to model the volatility of the Sukuk yield spread and factors that influence the volatility in the seasoned and new Sukuk yield spread in the Malaysia and Indonesia Sukuk market. The co-movement behaviour test will be applied by using GARCH (1,1); below are the equations of the mean (ARCH term) and the variance (GARCH); as shown in Equations (4.18) and (4.19):

$$SPV_{i,t} = C_1 + C_2SYSV_{i,t} + e$$

(4.18)

where:

SPV = stock price volatility

SYSV = Sukuk yield spread volatility with i structure at t period (where i = Al-Ijarah, Murabaha, and Al-Musharakah)

C_1 = constant

C_2 = coefficient of the stock price volatility

e = residual

$$H_t = C_3 + C_4H_{t-1} + C_5e_{t-1} + C_6SYS_t + C_7LER_t + C_8COP_t$$

(4.19)

where:

H_t = volatility of stock price

C_3 = constant

H_{t-1} = previous period's residual variance of stock price volatility

e_{t-1} = previous period's squared residual variance of stock price volatility (ARCH)

SYS = Sukuk yield spread

LER = local exchange rate

COP = crude oil price

4.3.4 Data Description

A total of 99 issuances from 9 companies listed on Bursa Malaysia and 36 issuances from 6 companies listed on the Indonesian stock exchange were retrieved

from the Thomson database. The sample from the Malaysian market is divided into two categories; the seasoned Sukuk issuances are 51 from July 2007 to November 2015, and 48 new Sukuk issuances from January 2008 to May 2016; as shown in Table 4.2. The sample from the Indonesian market is also divided into two categories, the seasoned Sukuk are 19 from July 2007 to December 2015, and 17 new Sukuk issuances from July 2013 to November 2016 (the different dates is due to the time lag between the seasoned and new sukuk issuance): as shown in Table 4.3. This study differentiates between the new and seasoned Sukuk criteria based on industrial classification and quality rating for both issuances (i.e., the new and seasoned Sukuk) as used by the study of Ederington (1974).

Table 4.2: New and Seasoned Sukuk Issuances - Malaysia

Malaysia	No of issuances	Sukuk structure			Amount in million ringgits	Amount in USD	YTM	
		Ijara	Murabaha	Musharaka			Mean	SD
Seasoned Sukuk issuance	51	8	41	2	11,590	3,219	4.5160	0.57223
New Sukuk issuance	48	5	33	10	7,805	2,168	4.9662	1.10274
Grand total	99	13	74	12	19,395	5,387		

Table 4.3: New and Seasoned Sukuk Issuances - Indonesia

Indonesia	No of issuances	Sukuk structure			Amount in billion rupiah	Amount in USD	YTM	
		Ijara	Murabaha	Musharaka			Mean	SD
Seasoned Sukuk issuance	19	16	3	0	2,818	216	8.8063	0.7406
New Sukuk issuance	17	13	4	0	3,507	269	8.8963	0.9343
Grand total	36	29	7	0	6,325	485		

4.4 Corporate Sukuk Liquidity and Stock Market Liquidity

4.4.1 Hypotheses Development

The liquidity and asset prices theory of Amihud and Mendelson (1986) is considered to be the initial work that conceptualizes the relationship between liquidity and asset price (Friewald et al., 2012). As argued by the theory, investors have different horizons of trading on assets; each horizon has a different expected return, taking into consideration the paid premium that resulted from the transaction costs (Schwert, 2017). The interpretation of this phenomenon is that illiquid assets have less trade-off and transaction costs, which lead to higher expected returns, while more liquid assets are costly due to the higher related transaction costs.

According to Tarun Chordia, Asani Sarkar, and Avanidhar Subrahmanyam (2005a), there is a cross-market dynamic between bond market liquidity and stock market liquidity; the shock in either bond or stock market liquidity will lead to affect other markets. The result obtained from the study of Chordia et al. (2005a) found that there are common drivers for both markets liquidity. This result was confirmed by the study of Goyenko, Ukhov, and Analysis (2009), which found bidirectional causality between bond liquidity and stock market liquidity. This two directions relationship provides evidence emphasized by the liquidity and asset prices theory of Amihud and Mendelson (1986), considering illiquidity as a systematic risk factor for bond and stock market liquidity, where a shock of cash flow in one market will affect the liquidity of other markets. This is attributed to the stock market dynamic that shares the same drivers with bonds. Also, the wealth allocation strategies between bond and stock market liquidity, as these strategies adopted by fund managers to mitigate market risk. These strategies rely on market conditions; for example, in economic distress, portfolio

managers and investors prefer to rebalance their investment toward fewer risk assets and high liquidity aspects. This phenomenon is documented by the study of Huang, Huang, and Oxman (2015) that include stock liquidity to the endogenous-default model used to calculate the bond value; the result revealed that a decrease in stock liquidity leads to an increase the bond credit risk, then occurs a drop in bond liquidity. Based on the above discussion, the spillover of the liquidity between both markets gives a reason to expect a relationship between both bond and stock market liquidity.

This study focuses on corporate Sukuk, which emphasizes an alternative channel through funding conditions, in which the liquidity of Sukuk can influence the stock market liquidity. The prior literature of Sukuk activity lacks testing the relationship between Sukuk liquidity and stock market liquidity due to the low frequency of bond transactions within the secondary market. To overcome this obstacle, this study uses the model of that suitable for measuring liquidity of assets that have low transaction frequency. Therefore, it is expected to find a significant linkage between Sukuk liquidity and stock market liquidity. Hence, the seventh hypothesis for the Sukuk market is as follows:

Hypothesis 7: Sukuk liquidity has a significant and positive influence on the stock market liquidity.

Linking the bond liquidity to the stock market liquidity helps in determining the conceptual relation between the bond return and stock value. Based on the study of Huberman and Halka (2001), who employed the stock portfolio volatility, volatility of treasury notes yield, and yield spread between corporate bond and one-year treasury notes to clarify their correlation to four liquidity proxies, they found a significantly positive correlation between the stock portfolio volatility and the volatility of treasury

notes yield to the liquidity proxies, but non-significant yield spread between corporate bond and one-year treasury notes. The literature on stock and bond market liquidity has developed in separate strands. There is good reason, however, to believe that liquidity in the stock and bond markets co-varies. Although the unconditional correlation between stock and bond returns is low (Campbell & Ammer, 1993), there are strong volatility linkages between the two markets (Fleming, Kirby, & Ostdiek, 1998), which can affect liquidity in both markets by altering the inventory risk borne by market making agents (Ho & Stoll, 1983; O'Hara & Oldfield, 1986). Moreover, stock and bond market liquidity may interact via trading activity.

In practice, a number of asset allocation strategies shift wealth between stock and bond markets. A negative information shock in stocks often causes a flight to quality as investors substitute safe assets for risky assets. The resulting outflow from stocks into Treasury bonds may cause price pressures and also impact stock and bond liquidity. Overall, the preceding discussion implies that liquidity can exhibit co-movement across asset classes and can also be driven by common influences, such as systemic shocks to volatility, returns, and trading activity. Furthermore, Chordia, Sarkar, and Subrahmanyam (2005) found evidence of a co-movement of stock and bonds in the financial market. Anderson (2017) investigated the causal relationship between bond liquidity and stock returns in which the yield spread of bonds is used as a measurement of bond liquidity. Anderson (2017) used the imputed round-trip cost (IRC) for measuring the bond liquidity, which estimates the transaction cost of trading by the difference between the ask and bid price over the maximum price of the imputed round-trip trades. His study findings revealed a significant relationship between bond liquidity and stock return, where improving the bond liquidity leads to improving the profitability, which can be gained by lowering the related transaction costs of higher

bond liquidity, as well as higher expected cash flow. In the context of Sukuk, Raei and Cakir (2007) found an impact from including Sukuk into the portfolio, which led to reducing the value at risk, thus confirming that Sukuk has lower relative risk compared to bonds.

Based on Chen et al. (2007), liquidity is essentially different across the asset credit risk, in that they attribute the bond price declining within the global financial crisis to the decrease of liquidity. Acharya, Amihud, and Bharath (2013) supported the argument that flight-to-quality influences the asset liquidity negatively; when illiquidity rises, there is a flight from low-rated bonds that are generally less liquid to the more liquid higher-quality bonds. Consequently, the prices of high-rated corporate bonds rise and the prices of low-rated bonds fall; both effects being measured relative to the average bond market return. Huang, Huang, and Oxman (2015) tested the linkage between bond grade and stock market liquidity pre and post the global financial crisis in the USA stock market; the findings revealed that bond grade explains the stock market liquidity at 0.5% pre-crisis, and at 9.9% post-crisis. However, the liquidity of a Sukuk may behave idiosyncratically in accordance with the specific situation of its issuer in the broader context of security behaviours within the corporate Sukuk market. Most corporate Sukuk market investments hold by investment institutions, while the rest of Sukuk market investments hold by individual investors, those bear very little knowledge about how the market works. As noted by Hanafi et al. (2018), this results in a series of Sukuk issuances in the market that exhibit greater liquidity simply, because individual investors do not know investment institutions or do not have access to them.

In respect of Sukuk grade, the higher grade of Sukuk represents the higher probability of repayment by the issuers, as well as the higher demand from the potential buyers in the secondary market. Hence, it is expected that Sukuk liquidity has a higher

association with the stock price. Therefore, the eighth hypothesis for the Sukuk market is:

Hypothesis 8: Higher Sukuk grade has a higher impact on stock market liquidity compared to low Sukuk grade.

4.4.2 Data Description

Due to the lack of the Sukuk market in providing the secondary market trading data, the sample of this study is limited to the Malaysian corporate Sukuk, where the required data to measure the latent liquidity of Malaysian Sukuk is available at the Bond Info Hub database operated by Bank Negara Malaysia. The aggregate trading activities of the corporate Sukuk are 108 observations on a monthly basis over the period from 2008 to 2016. The reason behind selecting this period is to measure the Sukuk latent liquidity during and post the global financial crisis in 2008. Table 4.4 exhibits the aggregate trading activities during the period from 2008-2016. It can be seen that the Sukuk market liquidity redoubled during the period 2011-2013, which attributed to the high outstanding of Sukuk within the secondary market.

Table 4.4: Sukuk Market Liquidity

Year	Annual turnover in RM million	*Average outstanding in RM million	**Market liquidity %
2008	42,683.60	153,557.30	27.80%
2009	70,774.82	165,127.53	42.86%
2010	124,876.93	176,658.55	70.69%
2011	298,360.04	193,859.13	153.91%
2012	419,340.43	235,291.07	178.22%
2013	471,127.61	276,514.23	170.38%
2014	315,314.16	307,422.64	102.57%
2015	96,764.25	344,621.97	28.08%
2016	127,440.06	380,005.45	33.54%

*Average outstanding: sum of outstanding amount of December of previous year and outstanding amount of December of current year, divided by two.

**Market liquidity: ratio of annual turnover over average outstanding, multiplied by 100.

Source: Bank Negara Malaysia (2015a, 2015b)

4.4.3 Empirical Methodology

4.4.3.1 Sukuk Liquidity Measure

Providing an optimal measure for bonds liquidity is still in debate, especially those that trade irregularly or are not traded in the secondary market, such as in the case of Sukuk. To overcome this issue, Mahanti et al. (2008) provided a new and simple measurement of liquidity for bonds that do not trade regularly. Hence, due to the daily trading data limitation of Sukuk, the liquidity measure of Mahanti et al. (2008), called latent liquidity, will be used to measure Sukuk liquidity. Opposite to the measurement of Amihud and Mendelson (1986) that relies on a daily basis trading, the latent liquidity measurement focuses on aggregate trading volume on a monthly basis, which proposes that the turnover of Sukuk trading is negatively related to illiquidity cost; as shown in Equation (4.20):

$$ASL = \frac{1}{D_{iy}}, \quad \text{where } D_{iy,t=1} = \frac{VOLSUK_{iyt}}{NSUKO_{iyt}}$$

(4.20)

where:

Amihud Sukuk liquidity = Sukuk liquidity using Amihud (2002) equation

VOLSUK = trading volume in Sukuk

NSUKO = number of Sukuk outstanding

iyt = Sukuk i on month t in year y

Amihud (2002) liquidity measures on absolute return and trading volume, also it is a robust measure of price impact (Hasbrouck, 2002), which is simply the average ratio of the absolute return in a bond to its trading volume in any given period. Meanwhile, the latent liquidity provided by Mahanti et al. (2008) defines the fractional holding of bond i (as a percentage of the total outstanding amount of the bond issue in our database) by fund j at the end of month t as $\pi_{j,t}^i$. Also, we define the average portfolio turnover of fund j from month t to month t – 12 as $T_{j,t}$, where the portfolio turnover is defined as the ratio of the value of fund j at the end of month t to the dollar trading volume of fund j from month t to month t – 12.

The latent liquidity, as defined by Mahanti et al. (2008), is the aggregate-weighted average level of turnover of the individual bond holding in the market. Therefore, applying this measurement to the Sukuk liquidity in this study will be defined as the level to which the turnover of individual Sukuk is a fraction of the total Sukuk market. Furthermore, the latent liquidity measurement in this study is defined based on Mahanti et al. (2008); as shown in Equation (4.21):

$$LLS_t^i = \sum_j \pi_{j,t}^i T_{j,t}$$

(4.21)

where $\pi_{j,t}^i$ is the latent liquidity of individual Sukuk i issued by issuer j at time t calculated as the aggregate weighted average of outstanding Sukuk to the total Sukuk market outstanding on a monthly basis; and $T_{j,t}$ is the average Sukuk market turnover by issuer j at the end of month t , which represents the ringgit trading volume ratio of the issuer to the total Sukuk market outstanding at the end of month t .

4.4.3.2 Stock Market Liquidity Measure

The primary measure of stock market liquidity, the relative effective spread, is generally considered to be among the best liquidity measures (Fang, Tian, & Tice, 2014). It is constructed using high-frequency trading data and is often used as the benchmark for liquidity measures constructed using low-frequency data. It is the ratio of the absolute value of the difference between the trade price and the midpoint of the bid-ask quote over the trade price as defined in Equation (4.22):

$$\text{Stock market liquidity (relative effective spread)} = \frac{2 |P_t - Mid_t|}{Mid_t}$$

(4.22)

where:

P_t = trade price at time t

Mid_t = the midpoint of the prevailing bid and ask quotes at time t

4.4.3.3 Control Variables Measures

For the purpose of investigating the linkage between Sukuk liquidity and stock market liquidity, three types of Sukuk grades are used – AAA, AA, A – which are rated by the Rating Agency Malaysia (RAM).

4.4.3.4 Seventh Hypothesis Testing

For the purpose of testing the seventh hypothesis that proposes Sukuk liquidity as a determinant of stock market liquidity, multivariate regression is used. This study uses two measurements of Sukuk liquidity, the measurement of Amihud and Mendelson (1986) that relies on a daily basis trading as stated in Equation (4.20), also the measurement developed by Mahanti et al. (2008) as stated in Equation (4.21), which relies on aggregate trading volume on a monthly basis. The multivariate regression model is defined as Equation (4.23):

$$STL = C_1 + C_2LLS + C_3ASL + e$$

(4.23)

where:

STL = stock market liquidity

LLS = latent liquidity of Sukuk

ASL = Amihud Sukuk liquidity

e = an error term

This study employs the Generalized Method of Moments (GMM) as a robust test to assure the result obtained. Regarding the absence of causal effects in the previous literature, such as Said et al. (2013), Kondor & Vayanos (2019), and Naifar and Mseddi

(2013), it is estimated with an econometric technique of dynamic panels, as is the case of GMM, with the objective of obtain consistent and efficient estimators.

4.4.3.5 Eighth Hypothesis Testing

The purpose of the eighth hypothesis of this study is to examine if the higher Sukuk grade (i.e., rating) has a higher impact on the stock market liquidity. Three models are constructed; these three models are constructed according to the rating of the sample, which is categorized into three grade rates as rated by the Rating Agency Malaysia (RAM). The grade rating is divided into three categories (AAA, AA, A), below are the Equations (4.24), (4.25), and (4.26) for the three models:

$$STL = C_{11} + C_{12}LLS_{AAA} + e$$

(4.24)

$$STL = C_{21} + C_{22}LLS_{AA} + e$$

(4.25)

$$STL = C_{31} + C_{32}LLS_A + e$$

(4.26)

where:

STL = stock market liquidity

LLS_{AAA} = latent liquidity of Sukuk – Rate AAA

LLS_{AA} = latent liquidity of Sukuk – Rate AA

LLS_A = latent liquidity of Sukuk – Rate A

4.5 Concluding Remarks

4.5.1 Sukuk Announcement and Stock Market Reaction

The event study methodology is employed to examine the stock market reaction towards the Sukuk issuance announcement. This methodology is structured to assess the financial instruments around an event, irrespective of whether this event is relevant to an internal or external action by the firm. The sample is structured from two regions; South-East Asia will be represented by two countries (Malaysia and Indonesia), and the GCC region will be represented by three countries (Saudi, UAE, and Qatar).

4.5.2 Sukuk Yield Spread and Stock Market Volatility

Identifying the interaction between the new Sukuk yield spread and stock price volatility was examined by using the GARCH (1,1) model, which is considered as being the optimal model to measure the volatility trends. The GARCH (1,1) was used to explain whether or not there is a difference in co-movement between the seasoned and new Sukuk yield spread with stock price volatility.

4.5.3 Sukuk Liquidity and Stock Market Liquidity

For the purpose of achieving the third objective of the study, which focuses on identifying the linkage between the liquidity of corporate Sukuk and stock return in the Malaysian market, the latent liquidity introduced by Mahanti et al. (2008) is used to measure the latent liquidity of corporate Sukuk. Also, the liquidity measurement of Yakov Amihud (2002) is used to test against latent liquidity, as recommended by Mahanti et al. (2008). The latent liquidity measure is appropriate for bonds that have limited trading activities within the secondary market. Unlike the previous measures of

liquidity that rely on the daily trading, latent liquidity relies on a daily basis, which enables it to deal with a bond that has less trading.

