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The American University in Cairo
School of Business

The Impact of Firms' Compliance to Shariah on Stock Price Synchronicity

A Thesis Submitted to The Department of Management

In partial fulfillment of the requirements for

The degree of Master of Science in Finance

By: Aya Mohamed Sharafeldin

Under the supervision of Dr. Neveen Ahmed & Dr. Mohammed Bouaddi

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ABSTRACT

The continuous growth in Islamic finance over the past decades grabbed the interest of empirical researchers who investigated different aspects of Shariah compliant firms. In this thesis, we are interested to explore the impact of Shariah compliance on stock price synchronicity and informativeness. Our rationale is that Shariah standard forced compliant firms to release more firm-specific information compared with conventional ones and given that Shariah compliant firms are more associated with information transparency taking into consideration the impact of the Shariah on the governance of the compliant firms. We claim that these features of Shariah compliant firms lead to less price synchronicity compared with conventional firms. We use data from 11 emerging and developed countries for the period of 2000 to 2018. Our findings suggest that firms' compliance to Shariah has a significant negative impact on stock price synchronicity confirming that Shariah compliance decreases the co-movements of the stocks. The results are consistent with the unique characteristics and the financial ratio constraints of compliant firms increase the information transparency and accuracy.

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Chapter I

1. INTRODUCTION

The rapid growth of Islamic finance is expected to continue as a result of the strong economic growth in the countries with Muslim population exceeding 1.6 billion. Islamic finance is related to firm's compliant with the Shariah law, principle and rules (IMF, 2017). Islamic investors are keen to invest in stocks that are committed to Shariah standards. Firms classified as Shariah, has to meet the pre-determined screening criteria including but limited to the source of earnings, business activity, along with other financial indicators Ashraf (2016). Moreover, listed Shariah compliant firms witness increase in the demand on their equity benefiting from the increase in the Islamic population Hooy and Ali (2017).

Several studies focused on the religion impact on the financial and economic performance by comparing the Shariah compliant firms with non-Shariah compliant firms. Firms committed to Shariah are not necessary enforced to blindly apply Islamic rules. Yet, they are more likely to deeply understand the vision of Islamic religion in terms of business activities Sergius and Savas (2014). Being committed to Islamic rules means that firms should give more attention to benefit the society not only focusing on maximizing shareholders wealth in order to be aligned with the Islamic believes that focus on the redistribution of wealth to insure better economic society Uddin (2003).

Many studies investigated the impact of the religion and cultural believes on committed firms. Some studies documented that firms' compliance to Shariah affected their stock price informativness. Naz et al (2017) documented that Shariah compliant firms have different financials structure compared with conventional one which might improve the reflection of releasing firm specific information on the firms' stock price.

Furthermore, more studies outlined the effect of the Shariah compliance on the accuracy of released information. Shariah compliant firms are more likely to record irregularity when reporting firm-specific information to external investors McGuire, Omar, and Sharp (2012). Moreover, pervious literature provided evidences that firms seeking compliance to Shariah tend to give more attention to avoid reporting asymmetric information taking into consideration financial reporting ethical standard imposed by Shari'ah law Sulaiman (2001).

Previous literatures introduced estimates for stock price synchronicity. Researchers divided the available information into two aspects into firm-specific information and market information. Firm-specific information represents the information released by firm's insiders to outsider investors. The financial performance of the firm should reflect the released firm-specific information while the market information affects the performance of all the stocks in the market. Yet, the reflection of this information varies across different stocks Morck, et al (2000) Chan and Hameed (2006). Thus, we investigate our hypothesis that Shariah compliant firms are forced to release more firm-specific information to be aligned with Shariah standard by testing the

effect of Shariah compliance on the co-movements of the stocks in different stock markets.

Therefore, we are interested to investigate the relationship between the Shariah compliance, and price co-movement taking into account the amount of information released by compliant firms. Hence, in this thesis, we use stock price synchronicity as a measurement of the amount and accuracy of firms' released information in different financial markets. Consequently, the aim of this thesis is to study the impact of Shariah compliance and stock price synchronicity given the Shariah standards which encourage compliant firms to be more transparent in terms of releasing firm-specific information compared to conventional ones Pepis and De Jong (2018). In addition, we believed that the financial ratios constraints imposed on Shariah compliant firms affect the availability of firms' specific-information to public investors which would impact the co-movements of the compliant firms.

We use panel data to estimate the link between Shariah compliance and stock price synchronicity. We apply panel least squares regression with period fixed effect for our data sample that includes 11 emerging and developed countries for the period of 2000-2018. We found that Shariah compliance causes lower stock price synchronicity confirming our hypothesis and supporting the evidence provided in previous literature. In addition, our findings support our expectation that Shariah compliance has positive effect on firm's information disclosure and increase firm's information transparency.

Our thesis contributes to the literature as to the best of our knowledge no previous papers investigated the effect of Shariah compliance on stock price synchronicity. Accordingly, we are the first to provide empirical evidence that reports the significant

negative relationship between Shariah compliance and stock price synchronicity in different stock markets.

This thesis proceeds as follows. In the next section, we review the previous literature on Shariah compliance in section 2.1 and stock price synchronicity in section 2.2. In section 3, we discuss our data and research methodology. In section 4, we show our results. Finally, section 5, provides concluding remarks.

Chapter II

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In this section, we review the literature on Shariah versus non-Shariah compliant firms and stock price synchronicity. To our knowledge no previous study examined the relation between Shariah compliance and stock price synchronicity. Yet, researchers were interested in evaluating the performance and the characteristics of the Shariah compliant firms versus Non-Shariah compliant firms with no consensus in their results as discussed in more details below.

In section 2.1, we review literature on Shariah compliant firms versus non-Shariah compliant firms while in section 2.2, we review literature on stock price synchronicity.

2.1 Shariah versus Non-Shariah compliant firms:

As a result of the continuous increase of the Islamic finance, the Shariah compliance became an area of interest for researches. Shariah compliant firms are distinguished from conventional firms by their business activities that should be within the allowed (halal) according to Shariah standards. In addition firms have to be aligned in their financial structure with the permitted level of debts, cash, and receivables declared by the Shariah law. Previous studies introduced several classification methods for firms to be defined as Shariah compliant firm versus non-Shariah compliant firm.

Previous studies compared the financial performance of Shariah versus non-Shariah compliant firms. Mixed findings were found in literature with no fated conclusion on Shariah or non-Shariah firms' outperformance. A recent study by Masih,

Kamil, and Bacha (2018) concluded that the existing literature on the Islamic stocks is not sufficient to give empirical results about the performance of the Islamic indices against the conventional indices. Hence, we hope that this thesis contributes to the existing literature by shedding the light on the co-movement of the Islamic stocks.

Several financial and Islamic institutions introduced Shariah screening standards with minor variation among them such as Morgan Stanley Capital International (MSCI), Financial Times Stock Exchange (FTSE), and Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI), and Dow Jones. Ashraf and Khawaja (2016) studied the difference in performance of different Shariah compliant firms' portfolios that were constructed using different screening methodologies of Shariah for a sample of data from Canada, Europe, GCC, and Japan for the period of 2003 to 2013. They constructed a model using Sharp (1964) and Lintner (1965) in their portfolio's evaluation. They found that Shariah screening methodologies have insignificant impact on the return of the portfolios since the source of Qiyas used is almost the same for all them. Hence, the similarity of the results for different portfolios is reasonable. In our research we refer to the Dow Jones S&P Indices methodology for 2019 to conduct the Shariah screening process.

Another study measured the effect of the degree of compliant of the Shariah on the volatility using data from MENA region for the period of 2003 to 2013. Ahmed and Farooq (2017) examined the volatility of the Shariah index against conventional index using Component GARECH model. They added further classification approach to the Shariah compliance by classifying the degree of compliant to Shariah to most compliant and least compliant in order to construct two portfolios with different degree of

compliance to be compared with the conventional portfolio. They documented that the degree of the compliance to Shariah affected the volatility. Moreover, they found that the Shariah compliant portfolio outperformed the conventional one. Their results attributed to better information environments associated with Shariah compliant firms that may reduce volatility given the characteristics of compliant firms.

Supporting previous results, Pepis and De Jong (2018) investigated the Shariah compliance effect on the long-run financial performance by comparing the long-run financial performance and the stock return of the fully Shariah compliant firms with several control groups in two different time periods from 1990 and 2018 using the return of assets (ROA) and return on sales (ROE). They found that the long-run financial performance of the fully Shariah compliant firms outperformed the non-Shariah compliant firms. They added that aspects of Islamic faith encouraged culture of transparency and accountability which would enhance the financial health of the Shariah compliant firms and improve their financial performance over the long run.

In contrast with these findings, other scholars found that Shariah compliance leads to underperformance. Farooq and Alahkam (2016) examined the difference in financial performance between non-financial Shariah compliant firm's and non-financial conventional firms in MENA region using ordinary least square (OLS) regression. They used market adjusted returns as a measurement for their analysis during the period of 2005 and 2009. They found that the non-financial Shariah compliant firms significantly underperformed the non-financial conventional firms in both civil and common law countries. They concluded that the underperformance of the Shariah compliant firms was due to the ratio constraints imposed on compliant firms. They concluded that Shariah

compliant firms' relatively low debt ratio may reflect less strict mechanism that would impact their performance negatively. In addition, they documented that Shariah compliant firms had relatively less cash and receivables compared to counterparty which negatively affected their business connections and network along with funding large capital expenditure.

Other studies indicates that there is no significant difference in performance of Shariah and non-Shariah compliant firms Albaity and Ahmad (2011), Setiawan and Oktariza (2013).

Furthermore, additional characteristics of Shariah compliant firms are proved to have an impact on their financial performance. For instance, the degree of Shariah compliant firms' commitment to the environmental, social and governance triggered the interest of researchers interested in Islamic finance. In addition, Social, culture responsibility considered substantial for Shariah compliant firms in order to balance the earnings with Shariah standard and to improve their contribution to benefit the economy Said et al (2018) as external financial institutions and Islamic investors are more likely to give higher attention to Shariah compliant firms to ensure that their businesses are aligned with the aspects of Shariah standard with higher ethical manner.

Erragragui and Revelli (2016) designed an experimental portfolio consists of 238 U.S listed companies from 2007 to 2011. They used environmental, social, and governance (ESG) screenings and socially responsible investments (SRI) to examine the effect of integrating the Shariah rules on compliant firms which are also committed to ESG and SRI to investigate whether socially responsible Shariah firm portfolio differ in terms of performance from other Shariah compliant firm with less ESG scores. Using

single-factor model provided by Jensen's, they found that higher ESG Shariah compliant firms outperformed lower ESG Shariah compliant firms. Also, they used other models, the four-factor models by Fama and French and robust industry-adjusted seven-factor model, to support their findings. The results confirmed the outperformance of the Shariah portfolios with more engagement in corporate governance compared to their counterparty. However, they concluded that the outperformance of the ESG Shariah portfolio hold only for governance engagement so that higher governance, products, diversity, and environmental issues in Shariah firms lead to better financial performance. On the other hand, their results reported lower performance Shariah firms committed to SRI compared to non-committed Shariah firm to SRI. They concluded that their findings attributed to the difference in the methodology of calculating the ESG and SRI screening process and scoring dimensions.

The positive impact of the governance for Shariah compliant firms were also provided by Ali and Al-Owaidan (2008). They conducted a critical review on the ethics of Islamic finance. They found that Islamic principles encouraged justice, hardworking, and community commitments which helped the society to improve the economic progress. In addition, they concluded that Shariah compliance put restriction on committed firms to give more attention to ethical standard in business activity, financial reporting, efforts, competition, and transparency.

Adding to that, a research conducted by Azam, Khalid, and Zia (2019) to investigate the impact of board diversity on corporate social responsibility (CSR) and the interaction effect of firm's compliance to Shariah with religious and ethical principles. They used data of 65 firms listed in Pakistan Stock market exchange (PSX) from 2012 to 2018 using

hierarchical moderated regression analysis to determine the moderating effect of the Shariah compliance on the CSR. Their study found a high level of Shariah compliance along with educational background and gender diversity significantly promoted the CSR activities of the compliant firms.

Other studies enhancing the previous findings were documented by McGuire, Omar, and Sharp (2012). They studied the impact of religion on financial reporting irregularities. They used a database of over 610,000 interviews conducted nationwide by the Gallup organization during 2008 and 2009 using factor analysis. Their results suggested that religiosity appears to act as a mechanism for monitoring corporate financial reporting behaviors. They investigated the impact of religious and social norms in case of the availability of external monitoring such as debt holders and institutional investors. They evidenced that religious influence is concentrated in more religious firms especially when external monitoring is low in such firms. They also concluded that financial reporting irregularities were affected by the religious attitudes of the population surrounding corporate headquarters which indicate that local levels of religiosity influence firms in a way that affected shareholder value and made religious people less likely to see financial reporting manipulation as an acceptable behavior. Similarly, Hamdi and Zarai (2013) found that firms operating with Islamic financial aspects are less likely to be engaged in earning manipulation considering Islamic aspects to be monitoring tool that improved the quality of reported earnings. In addition, they added that Islamic behaviors encouraged managers to avoid behaviors that might violate Islamic standard and ethics.

However, opposing results were documented by Alsaadi, Ebrahim, and Jaafar (2016). They compared the Shariah compliance against Social Corporate responsibility (CSR) with the earning quality. They used data sample comprises firms in ten European Union countries for the period from 2003 to 2013 using cross sectional approach. They found that firms engaged in CSR are less likely to manipulate earnings while being a Shariah compliant firm does not play in important role in influencing ethical conduct of firms. They concluded that being a part of Shariah index does not necessary mean that the firm is adhere to ethical codes. They suggested that their findings attributed to the Shariah screening process that only relies on the commitment of a firm to specific ratios to be classified as Shariah rather being influenced by the religious aspects.

However, the financial ratios associated with firm's classification as Shariah (Debt ratio, cash ratio, and receivables ratio) were proven to have a strong impact on firms' information releasing. Richardson et al (2001) found that firms with no debts are less likely to be engaged in earnings manipulation. In addition, other scholars documented that firms with high accounting receivables and cash are more likely to have less earnings quality Marquardt and Wiedman (2004) and Chung et al (2005).

Accordingly, in our thesis, we believe that the Shariah compliance has a positive effect on firms' transparency and releasing information. Hence, we test the hypothesis that Shariah compliant firms exhibit lower price synchronicity than conventional firms.

2.2 Stock Price Synchronicity:

Theory of efficient market hypothesis declared that the changes in the stock prices reflect all the available information (Fama, 1970) which makes the understanding of how stock prices commove of the stocks an important area to be studied as part of the market efficiency and allocation of the resources. In this thesis we refer to the co-movement of

the stocks by measuring stock price synchronicity. This grabbed the interest of many scholars such as Roll (1988), Morck et al (2000) who measured the co-movement of the stocks together in the same direction for a given period due to market-information and firm-specific information Tang et al (2011). Many researchers referred to the findings released by Roll (1988) and Morck et (2000) who proposed a simple regression equation in which firms return is the depended variable while the market return is the independent variable in order to report the R^2 of this equation that measures how much of firms' return is explained by market return. The recorded R^2 represents the measurement of the stock price synchronicity. High R^2 indicates that firm's return is more affected by the market return while low R^2 indicates that firm's return is more affected by firm-specific information which reflect high level of the stock's price informativeness.

Previous studies investigated the relationship between stock price synchronicity and different financial aspects such as gross domestic products (GDP) per capita, earnings quality, and quality of information environment to find out the reason behind the co-movement of the stock in certain market. However, another important aspect that was not given as much attention is the culture differences among different stocks. Scholars focused on other factors that affected stock price synchronicity such as corporate governance, social and culture responsibility (CSR). In this section, we conduct a literature review to investigate the different aspects that affected stock price synchronicity in order to find the link between the Shariah compliance characteristics and the co-movement of the committed firms.

A research conducted by Rao and Zhou (2018) examined the role of stock price synchronicity on the return-sentiment relation. They collected data of 937 common stocks in Shanghai stock exchange for the time period between 2006 and 2015 to construct a model using the EGARCH model. Their empirical results showed that the return-sentiment relation is positive and significant in different portfolios. In addition, they concluded that the impact of individual stock investor sentiment on stock prices decreases in stocks with stock price synchronicity. Their results confirmed that the role of individual stock investor sentiment decreases among stocks with good information environment with more firm-specific information impact than market specific information.

Another study by Farooq, Ahmed, and Bouaddi (2018) examined the effect of the stock price synchronicity on stock market volatility in MENA between 2005 and 2010 region. They documented that in regimes characterized by low volatilities, stock price synchronicity is considered a better prediction. The reason behind their findings is that their studies were conducted on stocks of conventional firms in emerging markets.

Other studies examine the cultural difference impact on the firms 'stock informativeness. Hermes and Emanuels (2015) studied the relationship between culture and voluntary disclosure by specifically focusing on the voluntary disclosure of information on internal financial controls. They used regression analysis for collected panel data sample of 4,370 firm-year observations in 29 countries during the period of 2005 to 2007. They found that differences in observed corporate governance practices, such as the disclosure of information on internal controls, were influenced by cultural differences. Hence, stock prices of firms that had higher corporate governance and

associated with releasing firm-specific information to public investors were less likely to record stock price synchronicity.

Another study investigated the effect of the culture differences on R^2 conducted by Eun, Wang, and Xiao (2015). They studied the impact of the culture on stock price synchronicity in 47 countries from 1990 to 2010 using R^2 as a measure for the co-movement of the stocks under study. They found that culture had a significant influence on stock price synchronicity through affecting investors' trading activities and a country's information environment.

Similar results were concluded by Morck et al (2000). They investigated the reason behind the existing of stock price synchronicity in emerging markets using data for 15,920 firms from 40 countries. They found that firms reporting higher synchronicity were generally from the countries with poor investors' property rights protection, relatively low per capita gross domestic product, less developed equity markets, less developed financial systems, and weaker legal regimes, which indicated that the differences in the cultures, environment, and external economic factors affected stock price synchronicity.

Adding to the previous findings, Jin and Myers (2006) provided evidence that poor investor protection was not the only rationale behind the increase in R^2 . They used a sample of more than 40 stock markets from 1990 to 2001 for regression model. They documented a positive relation between country-average R^2 and several measures of opacity supporting the argument that stock price synchronicity is affected by the level of transparency, firm-specific information provided to outsider investors.

Other scholars shed the light on the impact of the social trust on the co-movement of stock prices. Qiu, Yu, and Zhang (2019) investigated the effect of social trust on stock price synchronicity using a large sample of data of Chinese listed companies excluding financial companies and companies without unavailable information needed between 2006 and 2015. Applying a baseline regression model, they found that social trust had a significantly positive effect on the amount of firm-specific information that affected stock price synchronicity. They added that firms located in high social trust markets were more likely to have smaller price crash risk and opportunistic behaviors. Their findings was attributed to giving attention to emerging stock markets differentiated by weak formal institutions yet more diverse culture that enhanced the importance of culture role on firm's financial performance.

Accordingly, we developed our hypothesis based on the following: as Shariah compliant firms are more committed to ethical standard given the influence of the Islamic culture that impacts the financial performance, information transparency, and releasing information. Shariah firms should provide more firm-specific information compared to non-Shariah compliant firms. On the other hand, we found that Stock price synchronicity is affected by the culture differences of stocks in different markets in addition to the amount and the accuracy of the firm-specific information compared to market information. Therefore, we try to shed new light on the impact of Shariah compliance on stock price synchronicity of the stocks by comparing the co-movement of the Shariah compliant firms against Non-Shariah compliant firms. We expect that Shariah stock prices should be more affected by firm's specific information rather than market information, the co-movement of Shariah compliant firms is unexpected. Consequently,

stock price synchronicity should be negatively impacted by firms' compliance to Shariah given Shariah compliant firms' characteristics. Accordingly, we develop our hypothesis as follows:

H₁: Shari'ah compliance has a negative impact on stock price synchronicity.

Chapter III

3. DATA AND RESEARCH METHODOLOGY

In this chapter, we describe the data used, the source of the data including countries, number of observations in addition to the methodology used for our analysis to determine the effect of Shariah compliance on stock price synchronicity. Also, we discuss the control variables extracted from our research in literature. Section 3.1 includes description of the data sample and source of data, section 3.2 includes the methodology used for measuring the Shariah compliance, section 3.3 includes Stock price synchronicity measurements, and section 3.4 includes the selected control variables from previous literature, and 3.5 includes the descriptive statistics analysis, section 3.6 discusses the methodology used for determining the link between Shariah compliance and stock price synchronicity given the selected control variables, and section 3.7 includes our model.

3.1 Description of data:

Our data sample includes 11 emerging and developed countries: Australia, China, Hong Kong, India, United Kingdom, Ireland, Netherlands, Japan, Russia, Singapore, and Germany for the period January 2000 to December 2018 obtained from DATASTREEM. We ended up with a sample consists of 124,031 observations.

3.2 Measuring firms' compliance to Shariah

In order to classify the firms' observation to Shariah compliance firm or non-Shariah compliant firm, we use the screening methods introduced by Dow Jones (2019).

First, The sector-based screening. We eliminate firms with a core business that is not aligned with the accepted sectors according to Shariah standard. We eliminate firms that operate in industries such as alcoholic drinks pork production, tobacco, pornography, conventional insurance, conventional banking, and financial institutions or any other activities that are not permissible. The following screening step is the quantitative screening. Firms passed the first screening process are tested for being committed to the Shariah financial ratios standard represented in three ratios Debt Ratio along with Cash Compliance ratios which is related to Shariah rules of holding cash estimated using two ratios Cash Ratio and Receivable ratio. To calculate the aforementioned ratios for each firm we use the following formulas:

- 1) Debts ratio: leverage compliance represented in debt ratio that has to be less than 33% for a firm to be classified as Shariah compliant otherwise Non-Shariah compliant calculated with the following formula:

$$\frac{{}^1Debt}{{}^2Market\ Value\ of\ Equity}$$

- 2) Cash Ratio: has to be less than 33% for a firm to be classified as Shariah compliant otherwise Non-Shariah compliant calculated with the following formula:

¹ represents all interest bearing and capitalized lease obligations. It is the sum of long- and short-term debt.

² Market value of equity is calculated used the market capitalization for the last 36 trailing months

$$\frac{{}^3\text{Cash and Interest Bearing Securities}}{\text{Market Value of Equity}}$$

- 3) Receivable Ratio: has to be less than 49% for a firm to be classified as Shariah compliant otherwise Non-Shariah compliant calculated with the following formula:

$$\frac{{}^4\text{Account Receivables}}{\text{Market Value of Equity}}$$

3.3 Measuring stock price synchronicity

For the Measurement of stock price synchronicity, we follow the methodology proposed by Roll (1998) and Morck et al. (2000). We obtain the daily stock returns for all the firms including in our data. Further, we obtain the index daily returns for all the countries included in our data sample. We run the following simple regression equation in which the dependent variable is the firm's return and the independent variables is the index return. We report the R^2 for each firm's equation in our sample in order to find out how much of firm's return is explained by market return. :

$$R_{i,t} = \beta_0 + \beta_1 R_{m,t} + \varepsilon_t$$

Where $R_{i,t}$ represents stock i daily return in time t . $R_{m,t}$ is market index return at time t . We observe the recorded R^2 out of the model in order to estimate the percent of variation of the daily return of stock i explained by the market return $R_{m,t}$. A higher R^2 signalizes

³ Cash: represents money available for use in the normal operations of the company. It is the most liquid of all the company's assets. It includes but is not restricted to marketable securities and cash equivalents

⁴ Account Receivables represents the amounts due to the company resulting from the sale of goods and services on credit to customers (after applicable reserves). These assets should reasonably be expected to be collected within a year or within the normal operating cycle of a business.

a high degree of stock price synchronicity which indicates that stock prices frequently move together in this stock market.

However, R^2 is unsuitable as dependent variable in regression because its values are bounded with the intervals $[0, 1]$. Therefore, we adopt a standard economic remedy and apply logistic transformation to resulted R^2 values following Roll (1998) and Morck et al. (2000), as follows:

$$SYNC_{i,t} = \ln\left(\frac{R^2}{1 - R^2}\right)$$

High $SYNC_{i,t}$ values indicate individual stock returns strongly co-move with market returns reflecting relatively less firm specific information while low values of $SYNC_{i,t}$ indicate individual stock returns weakly co-move with market returns reflecting relatively more firm-specific information.

3.4 Control variables:

We use control variables that affect stock price synchronicity following the previous studies. We add firm's size $Size_{i,t}$. Larger firms with more diverse operations are believed to release more information compared to smaller firms kaife, Gassen, and LaFond (2006) and Hutton et al (2009). We add assets growth rate as firms with higher assets growth rate are believed to have lower returns with stronger effect in emerged countries (more informationally efficient) than emerging countries Watanabe et al (2012). We control for the capital expenditure as companies that have higher intention to expand should be more transparent in terms of releasing information on order to attract more investors and ease finding financing resource Jin and Myers (2006). Moreover, we use the dividends payout ratio as firms associated with higher level of information asymmetries are more likely to have higher dividends payout ratio to develop their

reputation Farouq and ELbannan (2019). We add the earnings per share to capture the impact of the firm's profitability. other control variables are added motivated by Hutton et al. (2009) and Jin and Myers (2006) such as the skewness and Kurtosis. The skewness of firm-specific daily return is the measure of asymmetry of the distribution of the series around its mean. The skewness of a firm was found to have inverse relation with R^2 measured by the following equation:

$$SKEW_{i,t} = \frac{1}{N} \sum_{i=1}^N \left(\frac{y_i - \bar{y}}{\hat{\sigma}} \right)^3$$

In addition, we add kurtoses of firm-specific daily return which measures the peakedness flatness of the distribution of the series believing that high kurtosis would cause lower R^2 measured by the following equation:

$$KURT_{i,t} = \frac{1}{N} \sum_{i=1}^N \left(\frac{y_i - \bar{y}}{\hat{\sigma}} \right)^4$$

3.5 Descriptive Statistics:

Table (1) and table (2) represent the descriptive statistics and the correlation matrix for the depended variable, the main variable of interest, and other firm specific control variables added from literature. Starting with the ratios calculated to determine the firms' compliance to Shariah against Non-Shariah compliance represented in Debts ratio, receivables ratio, and cash ratio recoding a mean of 53%, 41%, and 20% respectively noting that the mean of debt ratio exceeds the Shariah compliance standard while the mean of receivables ratio and cash ratio are within the Shariah ratio ceiling. Worth mentioning that our data sample contains 124,031 observations out of which 56,812 observation are Shariah compliant firms while 67, 219 observations are non-Shariah compliant firms.

We calculated the descriptive for control variables. The firms' size record a mean of 5.66 and standard deviation of 86.45. Capital expenditure records a mean of 56289.78 and a standard deviation of 161462 while earning per share records 0.473807 and standard deviation of 8,885585. These attributes to the variation in our data sample in terms of countries and years. On the other hand, assets growth rate records a mean of 12.27% and standard deviation of 36.30 while dividends payout ratio records a mean of 21.43% and standard deviation of 6% due to the difference in firms' payout ratios noting that the minimum recorded 0% and the maximum recorded 380%.

Finally, we added descriptive statistics for the values of the R^2 used to measure the stock price synchronicity for each firm of our data sample. The mean is 13% and the maximum is 100% which means that some firms of our data sample moved exactly in the same direction with the market while the minimum was 3.98E-12 which reflected that some firms' movements are not affected by the market.

We run Variance Inflation factor (VIF) test that measure the multicollinearity among the independent variables in a multiple regression model. The results⁵ show that there is no multicollinearity recorded among our variables the variables.

The correlation matrix for all the variables used in our regression is shown below in table (2). The results show that all the variables except the kurtosis are positively correlated with stock price synchronicity. Whereas Shariah showed is positively

⁵ The results of the VIF is shown in table (4)

correlated with firm's size, assets growth rate, dividends payout ratio, and skewness which means that these variables are positively correlated with Shariah while negatively correlated with the rest of the variables recorded. Firm's size is positively correlated with all the variables except for the kurtosis. As for the assets growth rate, the ratio is positively correlated with all variables except for dividends payout ratio and kurtosis that are negatively correlated with growth rate. The capital expenditure is positively correlated with all variables except Shariah and kurtosis. While dividends payout ratio is positively correlated with all variables except kurtosis and assets growth rate. Earnings per share is positively correlated with all variables except for kurtosis and Shariah.

Finally, skewness is positively correlated with synchronicity, yet other variables are negatively correlated. Finally, the kurtosis is negatively correlated with all variables.

Table (1)						
Descriptive Statistics (2000-2018)						
	Mean	Median	Maximum	Minimum	St.Dev.	No.of Obs
Shari'ah Ratios						
Debts	27971833	416751.5	19347564000	0.00000	721832.41	124031
Account Receivables	15766542	419827.5	9057206000	0.00000	133857411	124031
Cash and Interest Bearing Securities	8742558	135330	3784138399	0.00000	61896721	124031
Market Value of Equity	54517860	2925933	29866346278	65.5	413259998	124031
Debts ratio	0.532797	0.208679	4.596115	0.0000	0.790268	124031
Receivables ratio	0.418159	0.184983	10.29748	0.0000	0.66857	124031
Cash ratio	0.209103	0.103529	5.352641	0.0000	0.30504	124031
Shari'ah						56812
Non Shari'ah						67219
Control Variables						
Size	5.659564	5.181727	23927	-6.90775	86.45347	124031
Assets growth rate	12.26508	6.00000	366.8600	-100.000	36.29975	124031
Capital expenditure	56289.78	6541.000	1625551	-101.355	161462.7	124031
Dividends payout ratio	21.43830	16.19000	380.000	0.00000	0.069163	124031
Earnings per Share	0.473807	0.062000	361.0890	-192.946	7.885585	124031
Skewness	0.123595	0.094077	16.09360	-16.0936	1.839536	216092
Kurtosis	56.134445	6.595971	260.0038	1.00000	0.050921	216092
Stock Price Synchronicity						
R^2	0.139090	0.080672	1.000000	3.98E-12	0.152454	216092

Source: Author's calculations

The following table represented the correlation matrix of all the variables used regression

Table (2)									
Correlation Matrix									
Corr.	SYNC	SHC	SIZE	AGR	CAPEX	DPO	EPS	SKEW	KURT
SYNC	1.0000								
SHC	0.2015	1.0000							
SIZE	0.0423	0.0109	1.0000						
AGR	0.0309	0.0388	0.0047	1.0000					
CAPEX	0.4961	-0.0387	0.0377	0.0166	1.0000				
DPO	0.2199	0.0256	0.0113	-0.0191	0.1117	1.0000			
EPS	0.0662	-0.0184	0.0012	0.0214	0.0561	0.1166	1.0000		
SKEW	0.3704	0.1056	0.0209	0.0309	0.1072	0.1312	0.0362	1.0000	
KURT	-0.2009	-0.0651	-0.0135	-0.0197	-0.0494	-0.0825	-0.0244	-0.0608	1.0000

Source: Author's calculations

3.6 Methodology and Model:

Our hypothesis is developed to investigate the link between firms' compliance to Shariah standard and stock price synchronicity. We use least squares multiple regression model for the analysis of our panel data that included 11 countries out of which are 9 emerged countries and 2 are developed countries. First, we run Hausman test to determine the model used for our regression the results recommend fixed effect model. We run Lagrange Multiplier test for fixed effect. We find that individual effect is insignificant while the time effect is significant. We use period fixed effect since our data contains categories that we want to control for their characteristics that might affect our dependent variable.

3.7 Model

In this section, we discuss the model applied along with a brief description of the variables used to recognize the effect of the Shariah compliance on the co-movement of the stocks represented in the stock price synchronicity. We use least squares regression with period fixed effects to investigate the significance of the main independent variable of interest which is the Shariah compliance on our dependent variable which is the stock price synchronicity. We include firm specific control variables borrowed from literature to control for their effect on stock price synchronicity. The used control variables are firm's size, assets growth rate, capital expenditure, dividends payout ratio, earnings per share, skewness, and kurtosis. In addition, we do sensitivity analysis for our model to test the impact of each control variables along and the main variable of interest on our dependent variable.

The following multiple equations represent our main regression model to test whether Shariah Compliance has an impact on stock price synchronicity by including a dummy variable for Shariah. The value of one represents Shariah compliant firm otherwise the value is zero.

$$SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 CAPEX_{i,t} + \beta_5 DPO_{i,t} + \beta_6 EPS_{i,t} + \beta_4 SKEW_{i,t} + \beta_5 KURT_{i,t} + \varepsilon_{i,t}$$

- SHC , Measures Shariah compliance, we used a dummy variable. The Shariah compliant firms are equal to 1, Non-Shariah compliant firms' equal to 0.
- $Size_{i,t}$ is the natural log of the firm's market value of equity at the end of the fiscal year.
- ${}^6AGR_{i,t}$ is firm's assets growth rate at the end of the fiscal year.
- ${}^7CAPEX_{i,t}$ is the firms' capital expenditure at the end of the fiscal year.
- ${}^8DPO_{i,t}$ is the firms' dividends payout ratio at the end of the fiscal year.
- ${}^9EPS_{i,t}$ is the firm's earnings per share at the end of the fiscal year.
- $SKEW_{i,t}$ is the skewness of firm-specific daily return over the fiscal year.
- $KURT_{i,t}$ is the kurtosis of firm-specific daily return over the fiscal year.

⁶ Assets growth rate is the Current Year's Total Assets / Last Year's Total Assets - 1) * 100

⁷ Capital expenditure represents the funds used to acquire fixed assets other than those associated with acquisitions. It includes but is not restricted to: Additions to property, plant and equipment Investments in machinery and equipment

⁸ Dividends payout ratio Dividends Per Share / Earnings Per Share * 100

⁹ Earnings per share represents the earnings for the 12 months ended. It represents the fully diluted earnings per share for the companies.

Chapter IV

4. RESULTS

4.1 Model results:

Model 1 results are documents in table (3). Using panel least squares multiple regression method with period fixed effect, we find that Shariah compliance which is the main variable of interest is significant measured by *SHC* with a negative coefficient which means that the Shari'ah compliance decreases stock price synchronicity. Hence, we do not reject our first hypothesis that firm's compliance to Shariah has a negative impact on the co-movement of the Shariah stocks. We believe that this attributes to releasing more of firms' specific information by Shariah compliant firms compared to the conventional ones due to the financial characteristic of Shariah compliant firms in terms information transparency confirming the findings of McGuire, Omar, and Sharp (2012), Hamdi and Zarari (2013), Ali and Al-Owaihan (2008) and Pepis and De Jong (2018) who provided empirical evidence that Shariah compliance has an impact on the information disclosure and transparency in a way that enforce compliant firms to have less irregularity in reporting firm's specific information and financial reporting. In addition, our results confirm that financial ratios determined by Shariah standard have an effect on releasing information supporting the outlined findings by Marquardt and Wiedman (2004) and Chung et al (2005).

As for the control variables, our results show that firm's size measured by *Size* is significant with a negative coefficient supported the argument that larger firms are believed to release more firm specific information compared to smaller firms kaife, Gassen, and LaFond (2006) and Hutton et al (2009). In addition, the dividends payout ratio represented in *DPO* is significant with a negative coefficient which indicates that higher dividends payout ratio decreased stock price synchronicity contradicting with Farouq and ELbannan (2019) who documented that firms with higher dividends payout ratio are believed to have less accurate information. As for the assets growth rate *AGR* our results show that the ratio is significant with a negative impact on stock price synchronicity confirming the findings of Watanabe et al (2012). Furthermore, the Kurtosis *KURT* shows a significant impact on our depended variable with a negative coefficient. Stocks with high kurtosis recorded lower R^2 . Likewise, the skewness is significant recording negative coefficient to support that firm's skewedness is inversely proportional to firm's R^2 confirming the results found by Hutton et al. (2009) and Jin and Myers (2006). Other control variables such as Earnings per share *EPS* and Capital expenditure *CAPEX* are insignificant.

Table (3)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.027236 (0.017881)
SHC	-0.398010*** (0.050783)
SIZE	-5.75E-05*** (6.72E-06)
AGR	-3.22E-08*** (9.16E-09)
CAPEX	-1.14E-08 (8.29E-09)
DPO	-1.94E-06*** (6.24E-07)
EPS	1.28E-06 (1.04E-06)
SKEW	-0.136649*** (0.008260)
KURT	-0.036259*** (0.000759)
Observations	74,584
R-squared	0.130569
Adjusted R-squared	0.130266
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation:	
$SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 CAPEX_{i,t} + \beta_5 DPO_{i,t} + \beta_6 EPS_{i,t} + \beta_7 SKEW_{i,t} + \beta_8 KURT_{i,t} + \varepsilon_{i,t}$	

4.2 Sensitivity analysis results:

We start our sensitivity analysis a simple regression model that tests the impact of the Shariah compliance on stock price synchronicity. The results in table (5) confirm the negative significant effect of Shariah on the co-movements of the stocks. We add firms' size. The results in table (6) also confirm the negative significant impact of Shariah and the firms' size. We add the assets growth rate, the results in table (7) show that all variables are significant with negative coefficients confirming the previous findings. We added dividends payout ratio, the results in table (8) remain the same showing negative significant impact of Shariah and other firm-specific control variables on stock price synchronicity. We add capital expenditure, the results in table (9) confirm the previous findings for all the independent variable yet, and capital expenditure is insignificant. We add earnings per share; the results in table (10) support our findings for all control variables while earning per share is insignificant. We add skewness; the results in table (11) show that all the independent remain the same while skewness record negative significant impact on stock price synchronicity. In addition, we run a model another model after removing the insignificant variables in our previous results. We remove Capital expenditure and Earnings per share. The results shown in table (12) confirm our previous findings for all the variables included in our model. Therefore, our sensitivity analysis confirms our previous findings that Shariah compliance has a negative impact on stock price synchronicity.

Chapter V

5. Conclusion

This thesis aims to investigate the relationship between Shariah compliance on stock price synchronicity by having a rationale that Shariah standard put emphasis on compliant firm to be more transparent in terms of releasing firm-specific information. We shed the light on the Shariah compliant firms' characteristics in terms of information disclosure and financial ratios.

Following Dow Jones S&P Indices methodology for 2019, we classify our sample of data that included 11 countries out of which 9 emerged countries versus 2 developed countries, our sample includes contains 124,031 observation out of which 56,812 observations are Shariah compliant firms while 67, 219 observations are non-Shariah compliant firms. On the other hand, we follow previous literature for the measurement of the stock price synchronicity by using the firms' R^2 as a measurement of firm's co-movement with the market following Roll (1998) and Morck et al. (2000).

We use panel least square regression analysis with period fixed effect. Our results confirm our hypothesis that Shariah compliance has a significant negative effect on stock price synchronicity. Our findings support the empirical evidence documented in previous literature that culture and religion has an impact on the transparency and amount of releasing information to public investors.

The findings of this thesis is important for those who are interested in Islamic finance given the continuous increase in the Islamic population and the increase in the number of investors who give due attention to Shariah compliant firms in order to assure that they

are investing in stocks that are associated with their religious standards. In addition, our findings are remarkable for investors who are interested in hedging during bad performance of the market as Shariah compliance firms are proven to be more affected by firm-specific information rather than market information. Furthermore, our findings is noteworthy for Shariah regulatory body in setting the classification criteria for Shariah compliance.

Finally, future scholars may expand our research by adding some macroeconomic factors such as gross domestic products (GDP), inflation rate, and interest rate while investigating the impact of Shariah on stock price synchronicity in order to control for the differences in each country's economy.

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Appendix

Table (4)

Variance Inflation Factor (VIF)		
Variable	R^2	$\frac{1}{(1 - R^2)}$
SHC	0,015453	0.984547
SIZE	0.002772	0.997228
AGR	0.000156	0.999844
CAPEX	0.002021	0.997979
EPS	0.000895	0.999105
DPO	0.003393	0.996607
SKEW	0.00902	0.966098
KURT	0.07712	0.962288

Table (5)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.428186 (0.026533)
SHC	-0.483270*** (0.057678)
Observations	74,584
R-squared	0.014210
Adjusted R-squared	0.013958
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation: $SYNC_{i,t} = \beta_0 + \beta_1 SHC + \varepsilon_{i,t}$	

Table (6)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.427644 (0.026563)
SHC	-0.483095*** (0.057679)
SIZE	-0.000109*** (7.88E-06)
Observations	74,584
R-squared	0.014231
Adjusted R-squared	0.013967
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation:	
$SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \varepsilon_{i,t}$	

Table (7)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.427581 (0.026573)
SHC	-0.483155*** (0.057697)
SIZE	-0.000109*** (7.89E-06)
AGR	-4.40E-08*** (1.19E-08)
Observations	74,584
R-squared	0.014238
Adjusted R-squared	0.013961
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation:	
$SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \varepsilon_{i,t}$	

Table (8)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.427238 (0.026573)
SHC	-0.483104*** (0.057702)
SIZE	-0.000109*** (7.88E-06)
AGR	-4.40E-08*** (1.19E-08)
DPO	-1.97E-06*** (7.12E-07)
Observations	74,584
R-squared	0.014339
Adjusted R-squared	0.014048
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation: $SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 DPO_{i,t} + \varepsilon_{i,t}$	

Table (9)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.425035 (0.026658)
SHC	-0.483867*** (0.057785)
SIZE	-0.000107*** (7.21E-06)
AGR	-4.41E-08*** (1.19E-08)
CAPEX	-1.53E-08 (8.64E-09)
DPO	-1.97E-06*** (7.12E-07)
Observations	74,584
R-squared	0.014372
Adjusted R-squared	0.014068
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation: $SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 CAPEX_{i,t} + \beta_5 DPO_{i,t} + \varepsilon_{i,t}$	

Table (10)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.424992 (0.026657)
SHC	-0.483890*** (0.057783)
SIZE	-0.000107*** (7.21E-06)
AGR	-4.41E-08*** (1.19E-08)
CAPEX	-1.53E-08 (8.64E-09)
DPO	-1.97E-06*** (7.12E-07)
EPS	1.28E-06 (1.24E-06)
Observations	74,584
R-squared	0.014376
Adjusted R-squared	0.014059
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation:	
$SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 CAPEX_{i,t} + \beta_5 DPO_{i,t} + \beta_6 EPS_{i,t} + \varepsilon_{i,t}$	

Table (11)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.425633 (0.026821)
SHC	-0.484279*** (0.057995)
SIZE	-0.000114*** (6.97E-06)
AGR	-4.60E-08*** (1.30E-08)
CAPEX	-1.50E-08 (8.55E-09)
DPO	-1.97E-06*** (7.11E-07)
EPS	1.25E-06 (1.26E-06)
SKEW	-0.051458 (0.006946)
Observations	74,584
R-squared	0.015837
Adjusted R-squared	0.015507
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation: $SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 CAPEX_{i,t} + \beta_5 DPO_{i,t} + \beta_6 EPS_{i,t} + SKEW_{i,t} + \varepsilon_{i,t}$	

Table (12)

Dependent Variable:	Stock Price Synchronicity
Variable	Coefficient
Constant	-2.028908 (0.017894)
SHC	-0.397413*** (0.050775)
SIZE	-5.85E-05*** (7.25E-06)
AGR	-3.22E-08*** (9.18E-09)
DPO	-1.93E-06*** (6.24E-07)
SKEW	-0.136672 (0.008266)
Kurt	-0.036261 (0.000759)
Observations	74,584
R-squared	0.130547
Adjusted R-squared	0.130267
(1) Parenthesis imply St. Error.	
(2) *, **, *** indicate statistical significance at the 10,5 ,1% levels respectively	
The above regression was conducted by using below equation: $SYNC_{i,t} = \beta_0 + \beta_1 SHC + \beta_2 SIZE_{i,t} + \beta_3 AGR_{i,t} + \beta_4 DPO_{i,t} + \beta_5 SKEW_{i,t} + \varepsilon_{i,t}$	