Impact of Foreign Currency Derivatives on Firm Performance: Evidence on Shari'ah and non-Shari'ah Compliant Firms

(Kesan Derivatif Matawang Asing terhadap Nilai Firma: Bukti terhadap Firma Patuh dan Tidak Patuh Shari'ah)

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ABSTRACT

Hedging practices among Shari'ah compliant firms (ShC) are still not well explored and firms in Malaysia is very much lag behind in derivatives usage against firms in the developed countries. This study investigates the influence of financial derivatives usage on the value of Shari'ah and non-Shari'ah compliant firms (non-ShC) in Malaysia and compares the influence of derivatives usage on the value between the two categories of firms. To meet its objective, Generalized Method-of-Moment estimator (System-GMM) is employed on a set of panel data from 2000-2017. This study covers 200 firms engaged in derivatives which 59 firms are ShC firms and 141 are non-ShC firms. This study finds financial derivatives contribute positively to the value of Shari'ah compliant but negatively to the non-ShC firms. This study concludes that ShC performed better than its counterpart in risk management using derivatives. The findings enrich the current literature on the Islamic financial market and contribute to a better understanding relating to hedging activities. This study offers new evidence on risk management using derivatives in both Shari'ah and non-ShC firms and the importance of industrial diversification on firm value. This study suggests that the non-involvement in non-ShC firm's activities contributes to the lower risk profile hence a more effective risk management of the Shari'ah compliant firms.

Keywords: Risk management, derivatives, hedging, firm value, Shari'ah and non-Shari'ah compliant firms.

ABSTRAK

Amalan lindung nilai di kalangan firma patuh Shari'ah (ShC) masih belum diterokai dengan baik dan firma di Malaysia sangat ketinggalan dalam penggunaan derivatif berbanding firma di negara maju. Kajian ini mengkaji kesan penggunaan derivatif kewangan terhadap nilai firma patuh Shari'ah dan tidak patuh Shari'ah (bukan-ShC) di Malaysia. Kajian ini juga membandingkan kesan penggunaan derivatif ke atas nilai di antara kedua-dua kategori firma. Bagi mencapai objektif kajian, Generalized Method-of-Moment (System-GMM) diapplikasikan ke atas data panel dari 2000-2017. Kajian ini meliputi 200 firma yang terlibat dalam derivatif di mana 59 firma adalah firma ShC dan 141 adalah firma bukan ShC. Kajian ini mendapati bahawa penggunaan derivatif kewangan memberi kesan positif terhadap nilai firma patuh Shari'ah tetapi negatif ke atas firma tidak patuh Shari'ah. Kajian ini membuat kesimpulan bahawa firma patuh Shari'ah adalah lebih baik dari firma tidak patuh Shari'ah dari segi pengurusan risiko menggunakan derivatif. Kajian ini menawarkan bukti baharu mengenai pengurusan risiko menggunakan derivatif dalam kedua-dua firma Shari'ah dan bukan ShC dan kepentingan kepelbagaian industri terhadap nilai firma. Kajian ini berpendapat bahawa ketidakterlibatan dalam aktiviti firma bukan ShC menyumbang kepada profil risiko yang lebih rendah justeru pengurusan risiko yang lebih berkesan bagi firma patuh Shari'ah.

Kata kunci: Pengurusan risiko; derivative; lindung nilai; firma patuh Shari'ah dan tidak patuh Shari'ah.

INTRODUCTION

Risk management practices by firms are intended to mitigate risk. Understanding the most critical risks facing the firms allows stakeholders particularly managers to take necessary measures to minimize the impact of risks on firm's value. Recently, a massive growth in derivatives usage is reported among firms around the world (Bartram 2019). Bartram (2019) also added that non-financial firms have been using derivatives as risk management tools and as such, derivatives have become the most effective and efficient tool for corporate hedging. However, the collapse of some established and prominent U.S banks and financial organizations like Lehman Brothers, Merrill Lynch, and National City Bank raised many questions on the effectiveness of risk management using derivatives

in financial organizations. Zeidan and Rodrigues (2013) reported that the global financial crisis in 2008 which has led to the collapse of the firms was due to the failure of risk management. Firms in Brazil for instance, collapsed because of risk management failure (Zeidan & Rodrigues 2013) and 12 countries incurred losses in derivatives due to poor risk management strategies (Dodd 2009). Adam and Fernando (2006) and Stulz (2004) documented that firms' performances were severely affected by losses from derivatives. Following the collapse of some firms, especially due to scandals with huge derivatives-related losses, it is then important to improve the reporting information on derivatives activities (Bae et al. 2018; Blankley et al.2002). Consequently, derivatives have gained popularity as an effective hedging instrument for risk management (Ayturk et al.2016; Seng & Thaker 2018) and hedging during the financial crisis is said to be value enhancing (Alam & Gupta 2018).

In Malaysia, the awareness of derivatives among firms is still low and most managers do not understand the function and the importance of derivatives as a hedging instrument especially during an economic uncertainty. Managers are not keen on the use of derivatives because of the struggle in understanding its complication thus not capable in managing derivative instruments effectively (Ameer et al. 2012). Ameer et al. (2011) reported that the practice of derivatives among Malaysian firms is not as extensive as those in the developed countries due to their lack of exposures on derivatives and are generally considered to be costly and complex products. Lau (2016) also reported that only 26.8% of Malaysian firms have derivative contracts in their operation while the rest of them did not use any derivatives. Fazillah et al. (2008) reported that only 29% (101 out of 352) of the Malaysian non- financial listed firms hedged over a period of 2001 to 2005.

The financial crisis has shaped the scope of derivatives instruments in Malaysia. Bartram (2019) reported that firms in the U.S.A, U.K, Australia, Canada and New Zealand as well as firms in other countries that comply with the International Accounting Standard (IAS) are mandatory to reveal information on their derivatives position. So does Malaysia. Furthermore, according to the Securities Commission of Malaysia (SC) post 2008 global financial crisis, the Financial Reporting Standard (IFRS) has announced the requirement for public listed companies to provide information relating to derivatives usage in their financial statements to restore investors' confidence. In this regard, MASB makes it compulsory for listed companies to follow the IFRS for their reporting standard plus disclosing it through their listing requirement. This standard requires Malaysian listed firms to disclose their information on investment and financial derivatives in their financial statements. The practice is consistent with the IFRS 7, requiring listed companies to report their intention on the use of derivatives for hedging. Despite the requirement by MASB on the information disclosure, Abdullah

and Ismail (2017) documented that only 54% (162 companies) out of 300 Malaysian listed firms choose to report their derivatives positions for hedging activities. In addition, according to Wahab et al. (2020) only a small percentage of Shari'ah compliant firms reported their derivatives activities after the implementation of IFRS. Concerning the risk exposure, many firms face various types of risk and every firm has a different approach and technique to manage those risks. Nevertheless, despite the importance of derivatives for risk management, Ameer (2009) recorded that 298 firms in Malaysia do not participate in any form of hedging instruments while Ameer et al. (2011) found derivatives usage among Malaysian listed firms are very much lower compared to firms in the developed countries. Lau (2016) supports this and provides further evidence where he found 498 out of 680 non-financial firms listed in Bursa Malaysia did not report any exposure in derivatives from 2002 to 2012.

The development of the Islamic financial industry has become essential in the global financial system. Shari'ah-compliant firms must engage in the latest risk management instruments and skills to withstand the challenges in the present financial environment. With regard to that, Arif et al. (2019) reported the attitude of managers in relying on the current structure of conventional instruments as one of the key concerns that could impede the growth of Islamic risk management instruments in the financial market. Moreover, hedging practices among Shari'ah compliant firms are still not well explored and firms in Malaysia is very much lag behind in derivatives usage against firms in the developed countries (Wahab et al. 2020). In addition to that, Mohamad et al. (2014) also reported that, risk management via derivatives among the Shari'ah compliant firms is still in the preliminary stage, and the use of hedging instruments is found to be limited. Similarly, Ismail et al. (2013) stated that non-Shari'ah compliant firms widely practiced risk management unlike the Shari'ah compliant firms. Abdul Rahim et al. (2019) on the other hand, documented that Shari'ah compliant firms are found twice as likely as conventional firms to adopt hedging instruments implying that being Shari'ah compliant does not hinder the respective firms to hedge to mitigate risk exposure. It is worth noting that Islamic risk management instruments has increased based on the average volume of foreign exchange forward transactions (BNM 2017) and Malaysia is the leading country in Islamic finance with the most advanced Islamic capital market (Ledhem & Mekidiche 2020).

While Mitchell (2010) stated the failure of risk management as one of the factors contributing to the financial crisis in 2008/2009, Ahmed (2009) found that failure of risk management at different stages of company operation may lead to financial crisis. In this light, Islamic finance becomes an alternative to the weaknesses of the conventional financial system (Baber 2018; Nafis & Mohammad Shadique 2016). They also stated that during the financial crisis, Islamic finance is

in a better position to face economic decline compared to the conventional counterpart. Motivated by this, this study thus aims to investigate the impact of financial derivatives on the performance of both Shari'ah (ShC) and non-Shari'ah compliant (non-ShC) firms in Malaysia. The objective of this study is to examine and compare the influence of derivatives on the performance of these two categories of firm. In this regard, derivatives will act as an instrument to be used for hedging purposes especially during the crisis period and will ultimately result in optimum performance of the firm (Bae et al. 2018).

The paper contributes to the existing literature by providing new insights relating to the impact of hedging activities on firm value, hence better understanding on risk management via derivatives. Literature documents inconclusive findings in the use of derivatives as risk management practices. Nevertheless, it should be highlighted that this study differs from the previous studies on several aspects. First, unlike the previous studies on Malaysia, which only focus on listed firms in general, the sample of this study includes ShC as well as non-ShC firms and compares the risk management aspects between them. Following the mixed results and lack of studies on risk management via derivatives usage on ShC firms, this study therefore contributes to filling the gap in the existing literature. Finally, this study capitalizes on an extensive dataset of firms involving 18 years of study period (2000–2017) to categorize the influence of risk management on firm value, covering the crisis and non-crisis periods. This study offers new evidence on risk management using derivatives in both Shari'ah and non-ShC firms and the importance of industrial diversification on firm value. Besides, hedging efficiency is important to ensure that firm especially ShC firms are fully benefited from their risk management strategy. This study also suggests that the non-involvement in non-ShC firm's activities contributes to the lower risk profile hence a more effective risk management of the Shari'ah compliant firms.

The next section provides views on hedging from an Islamic perspective and a review of past studies. Next, the data collection, model specification and methodology are explained. Finally, the results analysis is reported and discussed, followed by a section that presents summary and conclusion.

HEDGING FROM ISLAMIC PERSPECTIVE

Hedging is a tool for protecting or mitigating risk-related loss that keeps recurring in the financial market. Hedging in conventional context includes risk management that influences firm value. However, hedging is seen as controversial in the Islamic view and debates on the issue are still ongoing. From the Islamic perspective, hedging is a method of precaution or minimization of loss from the risk that persistently exists in the financial market. Many Quranic verses offer guidelines and suggest men to have risk protection in their life. At the same time

there is a section in the Quran that discusses the financial context of risk management implying that managing risk is significantly important, as mentioned in Surah Yusuf (12:47-48):

Yusuf conveyed, "You will plant for seven years consecutively; and what you harvest leave in its spikes, except a little from which you will eat. Then after that seven difficult (years), which will consume what, you save for them, except a little from which you will store. Then will come after that a year in which the people will be given rain and in which they will press (olive and grapes)".

Prophet Yusuf translated the dream of the King based on the verse. After the seven years of prosperity in Egypt, the Kingdom will experience seven years of dry season and to overcome the upcoming disaster, the Prophet recommended the King to strategize the economy of the country. Specifically, Egyptians must prepare the activity of planting the crops and store as much as preparation for the long seven years drought. As a result, the people were able to survive when the dry season hit for seven years (Ibn Kathir 1988). Therefore, it is evidence that managing risk is vital for risk if not well managed, can bring destruction.

ShC firms should engage in hedging for effective risk management and it is important because the firms are exposed to the same risks as their conventional counterparts, such as currency risk, interest rates risk, commodity price risk, and operational risk (Ariffin 2012). Ariffin also added that the ShC firms are bound by Islamic principles and their performance is expected to be comparable with conventional firms. As claimed by Bakar and Ali (2014), ShC portfolios in Malaysia performed similarly to the performance of non-ShC portfolios during several economic crises. Furthermore, Ismail et al. (2015) found that ShC firms have higher earnings quality compared to the non-ShC firms in Malaysia. However, the use of hedging instruments among the ShC firms is found to be restricted (Mohamad et al. 2014). Jobst (2013) also claimed that, notwithstanding the rapid development of the Islamic finance, the limited ShC risk transfer instruments available in practice has raised doubts on effective risk management strategies among the firms. Thus, Zamzamir@Zamzamin et al. (2021) argued that ShC firms need to be well positioned to overcome the challenges posed by the current financial landscape in terms of the latest risk management capabilities and operational system.

Pok (2012) stated that the Securities Commission (SC) Shari'ah screening methodology prior to 2013 was considered liberal when compared to other world-leading screening methodology due to the lack of assessment of the financial standing of the firms. In 1995, the first Shari'ah compliant screening criteria was introduced by the Shari'ah Advisory Council (SAC) of SC which included both quantitative and qualitative screening. However, in November 2013, the SC has revised the screening method by identifying whether

a firm is involved in any of the non-permissible core activities. The firm then will automatically be declared a non-ShC if there is involvement in non-permissible core activities. In this case, no further quantitative and qualitative screening method will be conducted. However, if the firm's core activity does not involve in any non-permissible core activities, SAC will proceed with the activity screening, including financial ratio analysis and qualitative screening, before finalizing the status of the firm. The revised of the screening criteria according to (Abdul-Rahim et al. 2019) is to improve the acceptability of Malaysian ShC securities worldwide. Table 1 summarizes the comparison between the previous and current Shari'ah screening criteria.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Derivative instruments have developed and grown at a spectacular pace during the 1980s and 1990s. The derivative instruments consist of forward, swaps, futures and options. Due to its rapid development, many firms have actively participated in derivative markets. Following the rapid development, Allen and Santomero (1998) reported that the diversity of exchange-traded and over the counter (OTC) derivatives have increased extensively. Mian (1996) referred hedging as a risk management process undertaken by a firm to transfer risk and eventually affects firm value. Before the introduction of hedging theory, most of the scholars refer and rely on the classical Modigliani and Miller (MM) paradigm. This traditional paradigm indicated that the financial policy decisions impact firm value based on financing structure (Modigliani & Miller 1963). However, there are arguments among the scholars on the paradigm developed by MM particularly on the risk management strategies adopted by the firms. Some researchers recommend that hedging using derivatives is a strategy to increase firm value. In this regard, Demarzo and Duffie (1995),

Froot et al. (1993) and Smith and Stulz (1985) argued that tax incentives, underinvestment costs, expected cost of financial distress, asymmetric information and managerial compensation could increase firm value through hedging. Besides that, hedging strategy emphasizes the function of contraction cost and capital market imperfections. Due to this argument, Smith and Stulz (1985) proposed that hedging is proven to be useful during market imperfection. Similarly, Froot et al. (1993) also claimed that when external financing costs correlate with capital market imperfection, hedging is necessary.

Risk management has become very crucial especially during the financial crisis. Non-financial firms often managed their business risk through financial derivatives (Ayturk et al.2016). Previous studies focused on and investigated the various types of market risk facing non-financial firms. Linsley and Shrives (2005) reported that there is a meaningful association between risk disclosure and firm size for the U.K. listed firms and it is highlighted that the risk disclosure can be improved through cost reduction in firms' capital. This finding is in line with Beretta and Bozzolan (2004) where they found significant association between risk disclosure and firm size for Italian firms. Tanha and Dempsey (2017) also found that financial risk influenced firms to hedge. Chalmers (2001) argued that the selection of industries matters in the study of hedging using derivatives because various industries might have a higher (lower) needs for risk management strategies. In this regard, a few studies have examined the hedging practiced by firms in the Asian countries. For examples, Hu and Wang (2005) investigated the derivatives use in Hong Kong while Chalmers (2001), Chalmers and Godfrey (2000) and Nguyen and Faff (2010) studied the effect of hedging activities on listed firms in Australia. Most of the researchers investigated the effect of hedging on firm value. Allayannis and Weston (2001) reported that firm value is significantly improved after the firm taking hedging positions using foreign currency derivatives. This is due to firm value being exposed to currency risk

TABLE 1. Summary of the comparison between previous and current Shari'ah screening criteria

Assessment	Revised Shari'ah screening methodology (1995-2013)	Current Shari'ah screening methodology (2013-Current)
Qualitative screening	The firm must have good public perception or image	The firm must have good public perception or image The core activities of the company are important and considered *maslahah* (benefit in general) to the Muslim *ummah* (nation)
Quantitative screening	The calculation cannot exceed the following benchmark: 5% 10% 20% 25%	The calculation cannot exceed the following benchmark: 5% 20%
Financial ratio benchmark	Not applicable	The debt ratio (Debt/Total assets) and cash ratio (Cash/Total assets) cannot exceed 33%

Sources: Malaysia Islamic financial center (MIFC), www.mifc.com

and firms managed to protect its value through hedging. Bartram (2019) also established a positive association between derivatives usage and firm value. He examined the influence of hedging on risk and firm value of non-financial firms in 47 countries and confirmed the value relevance issue.

Faseruk and Mishra (2008) also stated that firm value increased in line with financial and operational hedging. They concluded that, with the increase in exchange rate risk, non-financial firms in Canada managed the risk through hedging via financial derivatives. Bartram et al. (2009) investigated the interest rate derivatives involving multi-industry firms and found positive effect of hedging on firm value. Furthermore, Adam and Fernando (2006) indicated that many firms could hedge their commodity prices, provide consistent pricing and avoid unnecessary losses when they use derivatives. Jin and Jorion (2006) in their study on firms in commodity business concluded that hedging contributes to higher firm value despite the presence of instability and volatility in commodity prices. Besides that, Mackay and Moeller (2007) also found that risk management through derivatives could increase firm value and later concluded that firms gained the reward from hedging because hedging creates value. They reported that firm value increased by 2% if the firm managed risk through hedging. Berkman and Bradbury (1996) found that derivatives usage contributes considerably to higher firm value. In the Malaysian context, Zamzamir@Zamzamin, Haron et al. (2021) documented that there is a positive influence of derivatives on firm value based on a sample of 200 non-financial firms. They argued that the risk management of ShC firms is less complex than the non-ShC firms due to its non-involvement in non-Shariah activities such as gambling in addition to the lower leverage of the ShC firms in line with the 33% maximum leverage screening benchmark. Besides, the finding is similar to Abdul-Rahim et al. (2019) who discovered foreign currency exposure motivates firms to hedge. Another study by Wahab et al. (2020) reported that ShC status of a firm significantly influences the firm to hedge.

Bhagawan and Lukose (2017) found that to hedge for currency exposure, firms tend to use derivatives. Allayannis and Weston (2001) found the engagement in foreign currency derivatives contributes significantly to firm value. Panaretou (2013) investigated the consequence of hedging on large firms in the UK and found that currency hedging proved to significantly contribute to firm value. However, there is weak evidence on the influence of interest rate derivatives on firm value. Chong et al. (2014) also found that derivatives usage minimizes firm risk enroute value maximization. Nevertheless, Ayturk et al. (2016) reported that most financial derivatives (currency and interest rates) engagement did not influence the value of Turkish firms. Likewise, Jin and Jorion (2006) found that hedging did not contribute to firm value for firms in the oil and gas sector. However, hedging reduces firm stock price volatility

due to the volatility in oil and gas prices. Furthermore, Magee (2013) reported no correlation between currency derivatives position and firm value. Similarly, Belghitar et al. (2013) also found that foreign currency derivatives did not influence firm value in French non-financial firms. Besides that Bae et al. (2017) stated that currency derivatives fail to contribute to higher firm value. In another study by Bae and Kim (2016) reported that the heavy exposure in foreign currency hedging by firms in Korea led to lower firm risk nevertheless, it failed to contribute to firm value. Furthermore, Phan et al. (2014) found currency hedging contributes negatively to firm value, mainly due to the inaccurate forecast in future volatility of foreign currencies. Meanwhile Gay et al. (2011) found that derivatives are negatively significant to firm value, in support of Nelson et al. (2005) who claimed firm value is negatively affected by the engagement in currency derivatives among the U.S non-financial firms. Besides that, Gounopoulos et al. (2013) found currency derivatives negatively associated with firm value due to extreme foreign exchange volatility during the financial crisis of 2007/2008. Following such varied empirical findings of derivatives usage among firms, this study hypothesizes the following:

H_1 There is a significant difference in the financial performance between ShC firms and non-ShC firms due to the different risk and business profiles between the firms.

H_2 The financial performance of ShC firms is better than the non-ShC firms due to the less complexity of its risk management and lower leverage which contributes to the effective hedging.

RESEARCH DESIGN AND METHODOLOGY

SAMPLE FIRMS

This study includes both non-financial firms (ShC and non-ShC) that engaged in derivatives for risk management throughout the period of 2000-2017. The sample covers 946 firms listed on the main market of Bursa Malaysia. After the filtering process, there are 200 firms engaged in derivatives during the period with 59 firms (ShC) and the remaining 141 firms (non-ShC). During the filtering process it was found that some firms do not take hedging position every year during the study period, hence no notional value of derivatives is reported by those firms. This study treats the observations as missing data as (Hsiao et al. 2014; Kleinke et al. 2011) argued that model estimation is not affected by missing data. Besides, this study adopts Cooks distance test proposed by Cook (1977) to handle extreme values in the dataset. To determine firms that engaged in derivatives during the period, we manually search the derivatives information in the firms' annual reports, downloaded from the Bursa Malaysia website. Keywords are used in searching for

the information on firms engaged in derivatives from the footnotes in annual reports. The keywords representing derivatives usage consists of derivatives, forward contract, forward foreign exchange, forward foreign currency, futures contract, cross-currency swap, swap contract, hedging, financial risk and financial instrument.

The sample firms in this study include firms in the non-financial sectors like consumer products, industrial products, plantation, construction, properties, technology, trading and services. As for the selection of ShC firms, following (Ramli & Haron 2017) the firms need to fulfill the following criteria that is, consistently be ShC firm every year starting from 2000 until 2017 and in accordance with the SC ShC yearly listing. This is in contrast to the selection of ShC status according to only specific cut-off year; say for an example, only based on November 2017 as per SC ShC listing. Ramli and Haron (2017) argued that the consistency in ShC listing reflects the real ShC status of the firms.

Hedging is proxied by derivatives engaged by the firms during the study period, which acts as the explanatory variable with control variables included in the regression models. Li et al. (2020) argued that Tobin's Q is widely used as a measurement of firm value in accounting, economics, and finance literature. They further stated that Tobin's Q does not only reflect past performance but also represents the firm's future development expectations. Moreover, Dakhlallh et al. (2020) also mentioned that Tobin's Q is an effective measurement to analyse corporate performance from a long-term market view, thus reflecting the present value of future cash flows based on current and future information. Thus, this paper employs Tobin's Q to measure firm value. Based on past literature, Tobin's Q becomes the dependent variable that measures the value of the firm. Following (Allayannis et al. 2011; Ayturk et al. 2016; Haron et al. 2020), Tobin's Q is defined as:

$$Q = \frac{Market\,Capitalization\,(Common\,Stocks) + Total\,Liabilities}{Total\,Asset}$$

For robustness check, ROA and ROE are employed as alternative measurements for firm value. ROA is widely used as a firm value indicator in the previous studies (Bartram et al. 2009; Brown et al. 2006; Choi et al. 2013; Gay et al. 2011; Lau 2016; Seng & Thaker 2018). Besides, Bartram et al. (2009) stated that derivatives users are larger (in size) and more profitable (higher ROA). Thus, ROA measures the efficiency of a firm in using its assets to generate return. ROE also acts as a strategic indicator for value of the firms. This study used ROE following (Bartram et al. 2009; Brown et al. 2006; Choi et al. 2013; Gay et al. 2011; Lau 2016; and Seng & Thaker 2018).

Financial derivatives are represented by foreign currency derivatives with expected influence on firm value. The derivatives value is according to the notional value of the derivatives contracts divided by total assets, in line with past studies (e.g., Ayturk et al. 2016;

Allayannis & Weston 2001; Bartram et al. 2011; Bae 2018; Jin & Jorion 2006; Magee 2013).

Control variables are incorporated in the regression following past studies. The control variables include managerial ownership, firm size, firm risk, firm leverage, firm access to the financial market, firm growth, industry effect, industry diversification and year effect. Ameer (2009) stated that manager's decision can influence firm value and managers tend to engage in hedging to maximize shareholders' value (Lievenbrück & Schmid 2014). Managerial ownership is measured according to the total shareholding owned by the directors of the firm over the total shares outstanding, following Ameer (2009) and Ahmad and Haris (2012).

Large firms tend to use derivatives compared to small firms (Ayturk et al. 2016; Lau 2016). Firm size is measured according to the natural logarithm of total assets (Allayannis et al. 2011; Ayturk et al. 2016; Lau 2016; Magee 2013). Firm risk also influences firm value. Bae et al. (2017) reported that the use of foreign currency derivatives by Korean firms reduce firm risk and increase firm value. Firm risk is measured based on the average standard deviation of daily stock returns and then annualized (Bae et al. 2017). Ability to access to financial market affects firm value as firm is less likely to face capital constraints (Allayannis & Weston 2001). If firms that use derivatives refrain a project because they are unable to gain financing, their firm value remains low due to preceding positive net present value (NPV) projects. This study follows Lau (2016) and Allayannis and Weston (2011) who measured firm access to the financial market based on dividend payment that is, firm that pays dividend in the present year equal "1" and "0" otherwise.

Firm value is known to be related to the capital structure of firm. To control for capital structure, leverage is also included as a control variable, represented by long-term debt over total shareholder's equity (Allayannis & Weston 2001; Allayannis & Miller 2011; Bartram et al. 2011; Bae et al. 2017; Lau 2016). This study also includes firm growth as growth influences firm value. The proxy for firm growth is the ratio of capital expenditure over sales (Allayannis & Ofek 2001; Ayturk et al. 2016; Lau 2016). This study also controls for industry effect and industry diversification. Decision to engage in derivatives by a firm is also influenced by the industry they belong to (Allayannis & Ofek 2001) If a firm that uses derivatives belongs to a high-Q industry, for example the technology-intensive industry, the firm is expected to generate more profit due to the industry itself (Lau 2016). Therefore to control for industry effect, this study first constructs the industry adjusted Tobin's Q, then computes the log difference between the weight-adjusted industry Q and multi-segment for each firm (Allayannis & Weston 2011; Ayturk et al. 2016; Lang & Stulz 1994). Industrial diversification similarly influences firm value. Highly diversified industries have a higher value compared to low diversified industries (Allayannis

& Weston 2001; Ayturk et al. 2016; Bartram et al. 2011; Bae et al. 2017; Nguyen & Faff 2010). This study uses the Herfindahl-Hirschman Index (HHI) to control for industrial diversification effect (Berger & Ofek 1995; Lang & Stulz 1994; Servaes 1996). The measurement of the HH index is the sum of the squared values of sales per segment as a proportion of total firm sales. This study also controls for year effect (dummy) in which the crisis years (2007 and 2008) are categorized as "1" while the non-crisis year (other years) as "0" (Abdul Bahri et al. 2018; Zeidan & Rodrigues 2013).

EMPIRICAL MODEL

This study examines the influence of hedging on firm value (ShC and non-ShC) in Malaysia. A panel regression model is employed, written as the following:

$$Q_{it} = \beta_0 Q_{it-1} + \beta_1 FC_{it} + \beta_2 MO_{it} + \beta_3 SIZE_{it}$$
$$+ \beta_4 RISK_{it} + \beta_5 LEV_{it} + \beta_6 ACCES_{it}$$
$$+ \beta_7 GROW_{it} + \beta_8 INDEFF_{it} + \beta_9 INDDIV_{it}$$
$$+ \beta_{10} DUMYEAR_t + u_{it}$$

(Equation 1)

Where Q_{it} is the firm value measurement (Tobin's Q) for firm i in period t. To capture the persistence in firm value, the lagged value (Q_{it-1}) is included as the independent variable. For robustness check, firm value is also measured based on ROA and ROE. The explanatory variable is FC_{it} i.e., foreign currency derivatives for firm i in the period t. Control variables: MO_{it} is the managerial ownership, $SIZE_{it}$ is firm size, $RISK_{it}$ is firm risk, LEV_{it} is firm leverage, $ACCES_{it}$ is firm access to financial market, $GROWTH_{it}$ is firm growth, $INDEFF_{it}$ represents industry effects, $INDDIV_{it}$ is industry diversification and $DUMYEAR_t$ refers to year dummy (crisis or non-crisis year). This study employs the dynamic model of System-GMM to control for endogeneity. Firm leverage and firm size act as endogenous variables following Magee (2013) and Ayturk et al. (2016) while the rest of the variables are exogenous. Equation 1 is applied to both categories of firms. Sarmidi et al. (2015) stated that when dealing with potential endogeneity of lagged dependent variables and the presence of firm-specific effect, it is inconceivable to estimate using panel estimation model, such as pooled OLS or fixed and random effect. Besides, Nickell (1981) indicated that with the use of static panel data estimation, the problem of aforementioned would lead to bias. He also reported that the prevalence of individual specific effect lagged behind dependent variable and possible endogeneity of independent variables make the traditional panel estimators (OLS, FE and RE) inappropriate. Marrero (2010) also stated that the OLS estimation of a dynamic panel model yields an upward bias of the coefficient of the lagged dependent variables. This means that the consistent estimate should be between the OLS and FE. Thus, the generalized method of moments (GMM) estimation has the capability to eliminate the problems as proposed by Arellano and Bond (1991).

This study uses the two-step System GMM approach (Arellano & Bover 1995; Blundell & Bond 1998). The System-GMM offers an improvement over the First Difference-GMM especially when the regressors are persistent. System-GMM is also reported to be better than First Difference-GMM due to being less bias and more accurate. Other than addressing the endogeneity issue, System-GMM is also capable of incorporating time-invariant explanatory variables, such as dummy year as in this study. To check for the consistency and validity of the instruments used in the model, Hansen Test (1982) is performed. It becomes relevant when the number of instruments is larger than the number of endogenous variables in the model. Hence, the over-identifying restriction can be employed to evaluate whether the instruments are correlated with the residuals. Besides, the Hansen Test is to ascertain whether the instruments appear exogenous and the null hypothesis of the model and over-identifying conditions are properly specified. In addition, the validity of the model can be further verified based on AR (1) and AR (2) tests for the presence of second-order serial correlation in the residuals. The null of AR (1) should be rejected and the failure to reject the null of AR (2) indicates that the model is robust (Blundell & Bond 1998).

RESULTS AND DISCUSSION

To meet the objective of this study, the selection of ShC firms that engaged in derivatives is crucial and needs special attention and process. Table 2 and Table 3 present the process of selecting the ShC firms and non-ShC firms. Initially there were 686 of total ShC firms as of December 2017 as stated in Table 2. As this study focuses only on the seven sectors, the number of ShC firms was reduced to 686. Since the study requires firms to consistently be ShC from 2000-2017, as recommended by (Ramli and Haron 2017), only 59 firms using derivatives remain at the end of the screening process. Table 3 shows the list of selected listed non-ShC firms. After the filtering process, there were 141 non-ShC firms that consistently engaged in derivatives (2000-2017).

Table 4 presents the summary of descriptive statistics for the firms, together with the comparison between ShC and non-ShC firms. Based on the two-sample *t*-test, there is significant evidence to conclude the difference in mean of firm value between the two categories of firms (p<0.01). The mean firm value of ShC is higher (1.15898) compared to non-ShC (1.09677). A mean of foreign currency derivatives is 13.8156 (ShC), which is not significantly different from 13.578 (non-ShC). This means both categories of firms used almost the same value of derivatives for hedging, on average. Other variables such as managerial ownership, firm growth, industry effect and industry diversification also show significant different between the firms. Table 2 and Table 3 present the correlation matrix between the independent variables.

TABLE 2. List of Selected Listed ShC Firms (2000-2017)

	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
No. of traded stocks in Bursa Malaysia	791	811	860	889	947	1011	1029	991	980
No. of Shari'ah compliant firms	606	642	684	722	787	857	886	853	855
No. of consistently Shari'ah compliant firms that engaged in derivatives (2000-2017)	59	59	59	59	59	59	59	59	59

	Year								
	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of traded stocks in Bursa Malaysia	959	961	946	923	914	905	901	904	905
No. of Shari'ah compliant firms	855	846	846	817	653	673	667	672	686
No. of consistently Shari'ah compliant firms that engaged in derivatives (2000-2017)	59	59	59	59	59	59	59	59	59

TABLE 3. List of Selected Listed non-ShC Firms (2000-2017)

	Year								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
No. of traded stocks in Bursa Malaysia	791	811	860	889	947	1011	1029	991	980
No. of non-Shari'ah compliant firms	185	169	176	167	160	154	143	138	125
No. of non-Shari'ah compliant firms that consistently engaged in derivatives (2000-2017)	141	141	141	141	141	141	141	141	141

	Year								
	2009	2010	2011	2012	2013	2014	2015	2016	2017
No. of traded stocks in Bursa Malaysia	959	961	946	923	914	905	901	904	905
No. of non-Shari'ah compliant firms	104	115	100	106	261	232	234	232	219
No. of non-Shari'ah compliant firms that consistently engaged in derivatives (2000-2017)	141	141	141	141	141	141	141	141	141

TABLE 4. Summary of descriptive statistics – ShC and non-ShC firms

Variables	ShC		Non-ShC		Difference	
	Mean	SD	Mean	SD	Mean	t-statistic
Dependent variable Firm value	1.15898	1.10673	1.09677	1.41970	0.0622*	
Explanatory variable Foreign currency derivatives	13.8156	2.50217	13.5783	3.00408	0.1013	2.38
Control variables						
Ownership	0.01713	0.01948	0.01517	0.16248	0.0019**	-1.21
Firm size	14.1097	1.80343	14.2780	2.13067	0.1683	-0.51
Firm risk	0.29897	0.15723	0.32438	0.17484	0.1240	-2.17
Leverage	0.25382	0.28236	0.57518	1.73319	0.3213	-2.14
Firm Access to financial market	0.825	0.38049	0.72362	0.44743	0.3775	2.35
Firm growth	0.08751	0.16491	0.11493	0.43867	0.0264**	-5.7
Industry effect	2.65999	0.69135	2.72476	0.88192	0.0647*	-1.37
Industrial diversification	0.11593	0.09573	0.14041	0.11722	0.0012**	-0.41

Note: *, ** represent significance at level p<0.1, p<0.01

TABLE 5. Correlation coefficients among variables for ShC firms

	Q	ROA	ROE	FC	MO	SIZE	RISK	LEV	ACCESS	GROW	INDEFF	INDDIV	DUMYEAR
Q	1.0000												
ROA	0.4399***	1.0000											
ROE	0.4893***	0.5333***	1.0000										
FC	-0.0265	0.0288	0.0099	1.0000									
MO	-0.1636***	-0.0431	-0.0780**	0.0065	1.0000								
SIZE	0.2579***	0.0570 *	0.0971***	-0.1579***	-0.2349***	1.0000							
RISK	-0.2980***	-0.2588***	-0.2142***	0.0418	0.1914***	-0.4380***	1.0000						
LEV	-0.0046	-0.0243	0.1319***	-0.0252	0.0043	0.0934***	-0.0343	1.0000					
ACCESS	0.1837***	0.2489***	0.2329***	0.0615	-0.0728**	0.2586***	-0.4380***	0.0628*	1.0000				
GROW	0.0252	-0.0202	-0.0210	-0.0116	-0.0927***	0.0982***	-0.0154	0.0395	-0.0875***	1.0000			
INDEFF	-0.3669***	-0.1750***	-0.1612***	0.0573	0.0561 *	-0.3707***	0.2486***	0.0218	-0.0700 **	-0.0429	1.0000		
INDDIV	-0.0223	-0.0547 *	-0.0269	0.0055	-0.0043	0.1771***	-0.0776**	0.0440	0.1433***	0.1087***	0.1637***	1.0000	
DUMYEAR	-0.0086	0.0425	0.0264	0.0519	-0.0200	0.0029	0.1504***	0.0121	0.0097	-0.0161	0.0211	-0.0159	1.0000

Note: *, **, *** represents the significance at level $p<0.1$, $p<0.05$, $p<0.01$

TABLE 6. Correlation coefficients among variables for non-ShC Firms

	Q	ROA	ROE	FC	MO	SIZE	RISK	LEV	ACCESS	GROW	INDEFF	INDDIV	DUMYEAR
Q	1.0000												
ROA	0.3211***	1.0000											
ROE	0.1172***	0.2071***	1.0000										
FC	-0.0093	-0.0063	0.0222	1.0000									
MO	0.2207***	-0.2245***	-0.4080***	0.0046	1.0000								
SIZE	-0.0446**	0.0402 *	0.0062	0.0176	-0.1172***	1.0000							
RISK	-0.0942***	-0.1732***	-0.0636***	0.0111	0.1621***	-0.3617***	1.0000						
LEV	0.0837***	0.0155	0.0361	0.1209***	-0.0094	0.2086***	-0.0150	1.0000					
ACCESS	0.0993***	0.2479***	0.1005***	-0.1384***	-0.2520***	0.2003***	-0.4214***	-0.0524**	1.0000				
GROW	-0.0142	0.0091	0.0013	0.1112***	-0.0175	0.0259	-0.0493**	0.0581**	0.0072	1.0000			
INDEFF	-0.0063	-0.0038	0.0246	0.0330	0.1421***	-0.2243***	0.1555***	-0.0212	-0.1882***	0.0161	1.0000		
INDDIV	-0.0341	0.0029	0.0039	0.0031	0.0364	0.0352	0.0017	0.0083	-0.0449**	-0.0127	0.0204	1.0000	
DUMYEAR	-0.0458**	0.0719***	0.0209	0.3127***	-0.0214	-0.0425*	0.1551***	-0.0096	0.0085	-0.0119	0.0996*	-0.0171	1.0000

Note: *, **, *** represents the significance at level $p<0.1$, $p<0.05$, $p<0.01$

The correlation coefficients among the variables are low denoting no concern on multicollinearity in the dataset.

REGRESSION RESULTS AND ROBUSTNESS TEST

Table 7 presents results on the influence of hedging on firm value. Foreign currency derivatives significantly contribute to higher firm value (Q) of ShC (p<0.01), therefore H_1 is supported. This finding provides evidence on the effective risk management strategies via derivatives adopted by the firm, hence increasing firm value. This is coherent with the findings of past studies (e.g., Allayannis & Ofek 2001; Bartram et al. 2011; Lau 2016; Tanha & Dempsey 2017; Zamzamir@Zamzamin et al.2021). This finding confirmed that there is a significant difference in financial performance between ShC firms and non-ShC firms. This is due to the ShC firms bound by Islamic principles and their performance is believed to be comparable with the conventional firms (Ariffin 2012) and the performance of ShC firms is similar to the performance of non-ShC firms during the economic crisis (Bakar and Ali 2014). Abdul-Rahim et al. (2019) claimed that ShC firms are twice as likely as conventional firms to use hedging instruments, and ShC status does

not prevent respected firms from employing contractual hedging to manage risk exposure. Mohamad et al. (2014) argued that due to the Shari'ah issues pertaining to harmonization, jurisdiction, characteristic and nature of the organization, there should be significant different in financial performance between ShC firms and non-ShC firms. Despite the ShC firms being restricted to only ShC business and investment activities, their risk management strategies are found to be similar to the non-ShC firms as both are subject to the same market risk (Bakar & Ali 2014). Conversely, the result shows foreign currency derivatives significantly contribute to lower value of non-ShC firms. The negative influence could be due to several reasons, among others, the inefficient hedging by the firms (Bae & Kim 2016; Nelson et al. 2005) and the many constraints involving the foreign exchange risk management (Bae & Kim 2016). Several control variables are found to significantly influence firm value, such as managerial ownership, firm size, risk, leverage, growth, industry effect and industry diversification. Table 7 also demonstrates the test of the validity of instrument (Hansen Test) and the test of AR (2) in residuals. The Hansen Test proves the over-identifying conditions are correctly specified for both regressions. In term of AR

TABLE 7. Impact of derivatives on firm value

Variables	(ShC)	(Non-ShC)
Tobin's Q (-1)	0.597***	0.311***
	(6.95)	(9.68)
Explanatory variable Foreign currency derivatives	0.0553***	-0.0285**
	(3.38)	(-2.39)
Control variables		
Ownership	-5.005***	-4.770**
	(-3.38)	(-2.32)
Firm size	-0.206***	-0.00912
	(-3.57)	(-0.25)
Firm risk	0.576**	0.0102
	(2.18)	(0.06)
Firm leverage	-0.171**	0.270***
	(-2.19)	(10.66)
Firm access to financial market	0.163	0.0696
	(1.38)	(0.55)
Firm growth	2.380***	-0.122***
	(5.41)	(-2.73)
Industry effect	-0.206***	-0.217***
	(-2.70)	(-5.67)
Industrial diversification	0.951*	2.064**
	(1.74)	(2.04)
Year Dummy	Yes	Yes
No of observations	193	416
AR (1)	0.050	0.020
AR (2)	0.554	0.262
Hansen Test	0.506	0.159

Notes: *, **, *** represent significance at level p<0.1, p<0.05, p<0.01; *z*-statistics are in parenthesis.

(2), the result shows the absence of serial correlation in the residuals for both regressions. This result fulfils the standard for validating the GMM estimation.

Table 7 also provides evidence on the better financial performance of ShC firms compared to the non-ShC firms. First, there is significant positive evidence on the influence of hedging on the value of ShC firms, in contrast to the negative influence of hedging on non-ShC firms. This result is consistent with Ismail et al. (2015) and support the argument that ShC firms are more resilient in risk management compared to their counterpart (Mitchell 2010; Nafis & Mohammad Shadique 2016). Furthermore, during the financial crisis, Islamic finance is more resilient to economic uncertainties compared to conventional finance (Nafis & Mohammad Shadique 2016). This notion is strengthened further by the difference in firm value between the two categories of firms. As reported in the descriptive statistics, the mean Q of ShC (1.15898) is found to be significantly higher than the mean Q of non-ShC firms (1.09677). Second, this study provides evidence that financial derivatives usage fails to protect value in the case of non-ShC firms.

Instead, engagement in derivatives causes reduction in firm value. Since Shari'ah principle is the basic tenet in risk management therefore the same principles should also be applied on ShC firms in their risk management practices involving derivatives hedging (Rosman & Abdul Rahman 2015). Thus, it supports the argument (H_2) that the financial performance of ShC firms is better than the non-ShC firms.

This study performs a robustness test for a consistency of result (Q) with alternative measurements (ROA and ROE), reported in Table 8. Hedging contributes significantly to the value of ShC firms (ROE) (p<0.01), consistent with Q. However, ROA reports a significant negative (p<0.01). The negative coefficient of ROA indicates that firms tend to increase the use of derivatives when their operating margin is low (Lau 2016) and in weak corporate governance, as well as less liquid derivatives seem to have played major roles in the effective use of derivatives (Nguyen & Faff 2010). As for the non-ShC firms, hedging caused value reduction for both ROA and ROE (p<0.01), further validated the result on Q.

TABLE 8. Robustness test for the impact of derivatives on firm value

Variables	ROA		ROE	
	ShC	Non-ShC	ShC	Non-ShC
Firm value (-1)	0.230***	0.247**	0.281***	0.155***
	(13.48)	(2.2)	(9.73)	(3.16)
Foreign currency derivatives	-0.00363***	-0.00486***	0.0108***	-0.0166***
	(-2.74)	(-3.25)	(3.22)	(-3.21)
Control variables				
Ownership	-1.964***	-0.254	-0.123	-1.418**
	(-3.52)	(-0.94)	(-0.23)	(-2.08)
Firm size	-0.0182***	0.0118**	-0.0193	-0.0232**
	(-5.33)	(1.97)	(-1.33)	(-1.97)
Firm risk	-0.0254	0.0564*	0.00161	0.0233
	(-0.75)	(1.76)	(0.02)	(0.60)
Firm leverage	-0.00511	-0.000803	0.0342	0.00221
	(-0.43)	(-0.66)	(0.69)	(0.26)
Firm access to financial market	0.130***	0.108	0.101***	0.216
	(5.38)	(1.49)	(2.77)	(1.32)
Firm growth	0.0295	0.0379	-0.554***	0.0685**
	(0.48)	(1.42)	(-4.48)	(2.24)
Industry effect	0.0119*	-0.00174	-0.0305	0.0175
	(1.93)	(-0.32)	(-1.45)	(1.28
Industrial diversification	-0.0389	0.181	-0.465***	0.115
	(-0.48)	(1.58)	(-3.05)	(0.40)
Year Dummy	Yes	Yes	Yes	Yes
No of observations	197	418	200	417
AR (1)	0.099	0.047	0.030	0.238
AR (2)	0.105	0.632	0.494	0.482
Hansen Test	0.408	0.748	0.945	0.212

Notes: *, **, *** represent significance at level p<0.1, p<0.05, p<0.01; *z*-statistics are in parenthesis.

CONCLUSION

This study examines the influence of foreign currency derivatives usage on the performance of firms in Malaysia. This study provides significant evidence that ShC firms performed better than the non-ShC firms in risk management using financial derivatives. The current study also differs from the previous studies in Malaysia on risk management of firms in general. With the comparison between the firms, the study fills the gap in the existing literature by offering new insight on the role played by risk management practice via hedging on firm value in Malaysia. Hedging does not necessarily benefit firms as demonstrated in the current study, hedging efficiency also matters in ensuring firms are fully benefited from their risk management strategies. Results of the study are robust to the various measurements of firm value (Tobin's Q, ROA, ROE), and the use of system GMM estimator controls the endogeneity issues. This study concludes that derivatives significantly contribute to firm value of ShC firms and out-performed the non-ShC firms. This study also provides evidence on the benefit of industrial diversification on firm value for both firms. This study confirms that hedging increases firm value as proposed by the hedging theory. Hedging efficiency is also pertinent in ensuring the ShC firms benefited the most out of their risk management strategies through foreign currency derivatives. The findings also gives another note that risk management strategies adopted by the ShC firms and its risk taking significantly contribute to higher firm value, in contrast to the non-ShC firms.

The current study is not exhaustive in the sense that its sample is limited to only 59 ShC firms engaging in derivatives during the study period. This is relatively smaller sample against the 141 non-ShC firms coupled with the low number of local firms engaged in derivatives for hedging. Due to this constraint, it may cause limitation on generalization of the results and representation of the whole population. For future study, researchers may investigate further the role of managerial ownership on hedging decision considering manager's decision can influence firm value (Ameer 2009) and managers tend to engage in hedging to maximize shareholders' value (Lievenbrück & Schmid 2014). Besides, the different effect of hedging on value between the two categories of firms from the Malaysian context provides important contribution. This context of analysis can be extended to other countries around the world that offer both ShC and non-ShC investments.

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