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Review Article

MACROECONOMIC SHOCKS AND LEVERAGE EFFECT ON MALAYSIAN ISLAMIC REAL ESTATE INVESTMENT TRUST STOCK RETURN

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Abstract

Over the past decade, Malaysia's Islamic capital market is emerging in achieving a total worth of 1.9 million or 61 percent of the overall Malaysian capital market as per December 2018. The establishment of Islamic Real Estate Investment Trust (REIT) gained a demand from investors in the Islamic capital market that claims to be a safe investment as it attached to the real estate to generate the source of income. Nevertheless, the Islamic REITs are structured and operating in accordance with the Shariah principle laid out by the Malaysia securities commission, as it is beneficial to the potential investors given its high liquidity and diversification opportunity compared to investing in physical property. In addition, although Islamic REIT is deemed to have a stable return given the real estate portfolio, there is still risk inherent such as an impact of the external forces. Therefore, the impact of macroeconomic factors shocks towards Islamic REITs is significant to the investors, policy makers and government to outline their relationship and facilitate their future growth. However, the evidence published on the listed Islamic REITs stock return in Malaysia is very limited and has seldom been modelled. The Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model and Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) model employed in this study to analyze the Islamic REIT stock return. The empirical finding show that the Islamic REITs exhibit an unstable behavior and volatility would take a longer time to respond to a shock in the market. Nevertheless, the magnitude of changes in price level of Islamic REITs tends to be greater in responding to new market information. Furthermore, it points out that the leverage effect of all the macroeconomic shocks towards Axis REIT and mix macroeconomic finding leverage effect for Aqar REIT and KLCC REIT in Malaysia. Nutshell, this study provides a discussion of Islamic finance to set a basis for Malaysian Islamic REIT, the regulatory framework, and conceptual model property trust funds in Malaysia.

Keywords: Malaysia Islamic REIT, Stock Return, Volatility and Leverage Effect

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INTRODUCTION

The Islamic capital market experienced an outstanding growth since year 2000 in Malaysia. The Islamic capital market size has reached 59.26% out of total capital market which is worth RM1,931.14 million as at December 2018 (Securities Commission of Malaysia, 2018). The capital market in Malaysia is unique among Asia as the market consists of conventional capital markets and Islamic capital markets. The Islamic capital market exists to provide a more systematic platform for fund mobilization, especially among Muslims who want to avoid being involved in the activities that are prohibited in Islam, such as gambling and contract ambiguity. Other than Islamic equity and Sukuk, one of the investment tools offered in the Islamic capital market is REITs. In November 2015, the Malaysian government issued the Islamic REITs guidelines proposed by the Shariah Advisory Council to shape the Islamic REIT to the Shariah principles and differ from the conventional REITs in terms of issuance and the underlying real estate (Dusuki, 2015). Islamic REITs and Conventional REITs share common features in terms of the management company, property manager, trustee and valuation method. However, Islamic REITs can only earn profit through halal activities in order to be compliant with Shariah principles. It means Islamic REITs are monitoring strictly on Shariahcompliant investment vehicles. Hence, a brand-new real estate investment creates an opportunity to investors who are willing to invest in Shariah-compliant instruments without owning the properties (Zainuddin and Nordin, 2016).

The Malaysian government has taken the initiative to promote Islamic REITs actively as an investment vehicle to develop the Islamic capital market. The Islamic REITs which are invested in income generating real estate based on Shariah compliance have become more popular as an alternative Islamic investment vehicle. The first Islamic REIT called Al'Aqar Healthcare REIT was introduced on 28 June 2006 (Ripian & Ahmad, 2016). Al'Aqar Healthcare REIT which focused on hospital and healthcare facilities was the first Malaysian company that launched Islamic REITs. It was also the first listed Islamic REIT in the world. Then, Al-Hadharah Boustead REIT was the second Islamic REIT listed in Bursa Malaysia, subsequently delisted on 2017. According to Hussin et al. (2016), Al-Hadharah Boustead REIT was involved in palm oil plantations and became the first Islamic plantation REIT in Malaysia. The third Islamic REIT introduced in Malaysia was AXIS REIT. It was the first Islamic office and industrial assets REIT that initially launched as conventional REIT in August 2005 but transformed to be Shariah compliant in December 2008 (Hussin et al., 2016). As stated in Ripian and Ahmad (2016), in May 2013, Malaysia issued KLCC REIT which was the world's first stapled REIT that stapled two or more entities into a new financial instrument. Furthermore, KLCC REIT combined the current

shares of KLCC Property Holdings Bhd (KLCCP) and was made up of three major components: Petronas Twin Towers, Menara 3 Petronas and Menara ExxonMobil. KLCC REIT is registered and traded on the main board of Bursa Malaysia (Wong, 2016). Furthermore, the Al-Salam REIT which joined Bursa Malaysia on September 2015, is a well-established conglomerate with interests in various property sectors such as healthcare, plantations, food and restaurant services, and real estate property. Table 1 shows the market capitalization and portfolio value for each of the listed Islamic REIT in Malaysia as at December 2018. It is noted that the market capitalization of the four Islamic REITs are above RM1 billion except for the newcomer Al-Salam REIT. Nevertheless, the KLCC REIT with stapled portfolio value of RM15 billion is the top in the list and the total portfolio value of the four Islamic REIT are RM20 billion. The Islamic REITs market continue to develop and reach RM19 billion of Islamic market capitalization which is 41.40% of the Islamic market (Securities Commission Malaysia, 2018). This shows that the Islamic REITs are developing well after the first introduction in year 2006 under the monitoring of the Securities Commission.

Table 1: Malaysia Islamic Real Estate Investment Trusts as at December 2018.

Islamic REIT	Establishment	Market Capitalization (RM' million)	Portfolio Value (RM' million)	Assets Type
Al-Aqar Healthcare REIT	August 2006	1,041	1,462	Healthcare
Al-Salam REIT	September 2015	580	928	Diversified
Axis REIT	June 2005	1,848	2,482	Office
KLCC REIT	May 2013	15,598	15,724	Retail
Total		19,067	20,596	

Sources: Respective Islamic REIT Annual Report 2018

According to Lee and Pai (2010), there is substantial literature that has investigated the volatility forecasting in financial products. However, the volatility of Islamic REITs has seldom been modelled and predicted as compared to the studies on Islamic performance by Ong et al., 2012; Hamzah et al., 2010; Ong, Teh and Chong, 2011; and Rozman et al., 2015. Furthermore, Ahmad et al. (2015) emphasized that research papers based on Islamic REITs are comparably lesser than conventional REITs or any other REITs, due to different stock pricing and establishment date of REITs. Therefore, the evidence published on the stock return of listed Islamic REITs in Malaysia is very limited. A barrier was created for Islamic REITs investors to have better understanding towards REITs stock price volatility due to lack of information. According to Pham (2012), the volatility of Islamic REITs' stock price is the main concern of the investors to invest in the Islamic REITs market given the price fluctuation and benefits across regional diversification. Nevertheless, the stock prices are more difficult to forecast with the occurrence of market risk fluctuation and based on the random walk theory. However, there are researchers who also indicated that economic conditions are unable to be foreseen with the existence of uncertainty and its impact towards Islamic REITs as in the study of Hussin et al., 2017. In fact, the economy cycle can have time varying effect on the REITs and it is related to conditional volatility of macroeconomic risks.

Furthermore, the Islamic REIT faced an issue where it appears unattractive to an investor as the Malaysian REITs will remain volatile due to global conditions, as announced by Malaysian REIT Managers Association chairman, Datuk Jeffrey Ng in a press release (theStar, 17 July 2019). He highlighted that an investor should consider the uncertainty before the share prices become volatile and the rapid rise of the interest rate would prompt the sell down of REITs in early next year. On the other hand, the Malaysian economic conditions are full of uncertainty which are related to the government policies which have a significant impact on macroeconomic indicators given the changes in the new government in the 14th general election (Moniruzzaman and Farzana, 2018). In line with the macroeconomic indicators, Kuwornu and Owusu-Nantwi (2011) emphasized that stock market price fluctuation is influenced by macroeconomic variables such as inflation rate and exchange rate. The authors urged a further exploration on the impacts of exchange rate fluctuations and systematic risk on the REITs stock return.

Moreover, according to Preis et al. (2012), a financial asset such as stock often possessed a leverage effect that explains a negative shock is greater than a positive shock given for a period of time. The leverage effect is the phenomenon of a future volatility negatively correlated with past returns. In such a case, according to the past studies, the authors investigated the existence of leverage effect for stock market in different countries (Black, 1976; Christie, 1982). In fact, Suska (2015) found that leverage effect is asymmetrical where the value of the Islamic REITs' stock decreases will lead to increases in volatility. The decreases of leverage effect also result in decreasing of risk. In addition, Chen and Wang (2006) stated that the leverage effect on volatility of stock market is more significant in market downward movement compared to upward movement. Nevertheless, a dynamic model of volatility that only captures leverage is difficult to find in such a way that the resources themselves are restricted in only examining the impact of macroeconomic risks on the stock market. Hence, this study attempts to determine the volatility persistence and leverage effect of macroeconomic shocks such as inflation, exchange rate, interest rate, money supply and economic growth on Islamic REITs market given its Shariah-compliant characteristics.

LITERATURE REVIEW

Islamic Real Estate Investment Trusts

In July 2006, the establishment of world's first Islamic REIT in Malaysia have initiated the growth of Islamic capital market and offered a new perspective in term of financial management. The Shariah compliant requirements makes a structural difference between Islamic REIT and conventional REIT where Islamic REIT regulated under tight supervision of property investment under Malaysia securities commission. Islamic REIT appears as an alternative investment channel for investors that interested in Shariah compliant properties investment. In fact, Islamic REIT basically invests their fund into well-developed sets of Shariah compliance portfolio that involves property securities such as residential, commercial, and warehouses. (Malaysia International Islamic Finance Centre, 2013). Securities Commission Malaysia 2005 Guidelines defines Islamic REITs as collective investment scheme in real estate, in which the tenant(s) operates permissible activities according to the Shariah principles" (Malaysia International Islamic Finance Centre, 2013). The investment activities included the property leasing and acquisition on Shariah-compliant basis. An Islamic REIT consciousness accept new investments that operate that considered non-Shariah compliance activities (Securities Commission Malaysia, 2005). However, in term of investments on mixture of both Shariah-compliant and non-compliant activities, the total rental income portion that generated from non-permissible businesses relative to Islamic REIT total turnover are required to be less than 20%

(Zainuddin & Nordin, 2016). There are several rental activities are considered non permissible activities in Shariah perspective. First of all, Islamic REIT investment should avoid engaging in interest-based (riba) businesses and services since it violates the Shariah principles (Malaysia International Islamic Finance Centre, 2013). Islamic REIT will employ Takaful scheme for property investment protection, but the conventional insurance scheme is applicable when Takaful plans are unable to achieve the insurance coverage (Securities Commission Malaysia, 2005). Furthermore, property business involves haram elements such as alcohol, tobacco, gaming, gambling is prohibited in Islamic REIT. Besides, the decision on investments qualifications of non-space using activities must depend on ijtihad, the discussion of Islamic jurists for legal ruling based on Shariah principles (Zainuddin & Nordin, 2016).

A strong regulatory framework in Malaysia plays an important role in governance and investors protections. An Islamic REIT in Malaysia is regulated by Securities Commission that provides clear guideline and incentives for Islamic REIT growth. According to Islamic structure, a typical Islamic REIT consists of investor, REIT manager, Shariah Advisory Committee, trustee, and regulatory authorities (Securities Commission Malaysia, 2005). The establishment of Islamic REIT investment must be approved by Shariah advisory committee in term of Shariah perspective. Shariah Advisory Council was formed by Bank Negara Malaysia under Section 16b of the Central Bank of Malaysia Act 1958 to ensure Shariah compliance in Islamic products (Laws of Malaysia, 2006). Furthermore, rules and regulation for Islamic REIT was formulated on November 2005 that applicable in global Islamic financial sector. An Islamic REIT should comply with the Shariah principles and also the rules in Securities Commission of Malaysia.

Stock Volatility Persistence and Leverage Effect

According to Gatheral (2011), volatility is a type of rate or yield which the market price of an investment fluctuates for a given set of return. Volatility used to measure the risk of the securities by using standard deviation or option pricing formula to estimate the increases or decreases of return of underlying assets that may be happening in a short period of time. If the price of securities fluctuates rapidly in short period of time, it is considered as high volatility and encounter in high risk (Gatheral, 2011). Mitra (2009) stated that volatility show the dynamic pricing of securities because it is the key variables in controlling an asset price. According to Schiller (1981), the stock market is a famous leading indicator of the economy which involve the market volatility that can be applied to macroeconomic variables and measured of market efficiency.

In the study of Zhou and Kang (2011), sated that REIT's volatility can be forecasting by comparing the relative performance from the Autoregressive Fractionally Integrated Moving Average (ARFIMA) model and Fractionally Integrated Generalized AutoRegressive Conditionally Heteroskedastic (FIGARCH) model. In which the two models to be considered as long memory model can provide the best prediction for the REIT's volatility. Their findings recommended that the best model should be adopted to predict REIT's volatility is long memory model. According to Osmadi and Razali (2014), the authors provided a study about the performances of Islamic REITs during the global financial crisis from 2007 to 2009. Their study result showed that Islamic REITs are more volatile than conventional REIT when dealing with the global financial crisis.

On other hand, Sing, Tsai and Chen (2012) mentioned that the volatility persistence will cause the stock price of REIT to increase. Nevertheless, the declining of REIT stock price will be happened when volatility persistence encounter negative shocks. Beg and Anwar (2012) indicated that the volatility for stock price may only last for a few hours while the volatility for financial asset can last longer. Fakhfekh et al. (2016) explained that the volatility persistence should be investigated to estimate the propagation of shocks and economic downturn that would affect whole financial systems. The determination of volatility persistence is important to estimate the effect of a changing volatility. Diebold (1986) pointed out that high persistence in volatility may be bias in case there are structural shifts in the conditional volatility and it perhaps the increases in outlier returns would result by large volatility shocks. The expectation of volatility many periods in the future will be affected by the volatility clustering. The time series of financial asset returns always display the volatility clustering characteristic shows that the large price changes tend to cluster together will result in persistence of the amplitudes of price changes.

Macroeconomic Indicators

Liu, Loudon and Milunovich (2012) suggested that inflation has a statistically significant positive effect towards REIT which implying that REIT returns have stronger correlation with inflation. REIT returns will also be affected by inflationary expectations although the real estate provides a hedge against inflation. The study further was supported by Kodongo (2017) which stated that changes in inflation are significant and positively affect risks of REITs returns. Nevertheless Marfatia, Gupta, & Cakan (2017) reported that the inflation has significant negative impact on the REIT returns because REITs are known to be sensitive to inflation across the world. The interconnectedness of the international real and financial economy will strengthen the impact of inflation in the post-2000. Furthermore, Ewing and Payne (2005) also support Marfatia et al (2017) statement by explaining there is expected with an aggregate price shock when the prices are slow to adjust. Therefore, an inflation leads to lower expected return of REIT. Nishigaki (2007) also reveal that when inflation rate rises, the REIT performance will drop in the long period.

Moreover, Fang et al (2016) stated that there is a clear negative impact of inflation rate on the REIT and insignificant relationship in Japan REIT. This is due to Japan as a developed country and its inflation is high. The demand of Japanese investors for REITs does not significantly reduced although there is increase in inflation rate in Japan, which leads not to affect its REIT index in the short time period. Therefore, author mentioned that, inflations has no impact on the underlying real estate in the REIT. In the study of Olweny and Omondi (2011) also found out that there was leverage effect which the volatility rises more when the price drops drastically than the following price rise of the similar magnitude. It takes a short time for the effect of shocks to wear off followed by a crisis that happen in the market.

The effect of exchange rate on Islamic REIT markets plays an important role in performing risk management strategies for financial market participants (Ewing, 2005). There are a plenty of research explored about the relationship between exchange rate and REITs' stock price. Most of the literature review mentioned that the changes in the value of exchange rate will result greater impact on the REITs price (Hussin et al, 2017). According to Maysami and Koh (2000), there is a positive relationship between foreign exchange rate and REITs' stock price when an increase the reserves and money supply caused the declining of interest rates could appreciate the currency of dollar and increasing the REITs' stock price. Besides that, Ibrahim and Aziz (2003) also found that the positive relationship fall between exchange rate and REITs prices significantly affect the movement of the REITs' stock price.

According to Loo, Anuar, and Ramakrishan (2016), examine the significant impact of several macroeconomic variables that impact on short and long-term interest rates with the Asian REIT market. The authors concluded that, the developing REIT markets such as Malaysia, Thailand, and South Korea have higher sensitivity towards the macroeconomic environment uncertainty as compared to developed REIT markets that consist of Japan, Hong

Kong and Singapore. According to Mohamad (2016), study proved that interest rate has significant positive impacts on the REITs performances in Malaysia. Furthermore, in the study of Yusuf, Hussin, and Ramli (2015) said that, the existence of relationship between Islamic REIT with Islamic Interbank Rate. According to Allen et al. (2000), the scholars' research reported that REITs are more sensitive to changes with long-term basis instead of short-term interest rates and claimed to have stronger correlation with long term interest rate variation as compared to shorter term in the post global financial crisis context.

On the other hand, Osmadi and Razali (2014) evidenced that the negative impacts of interest rate that tends to deteriorate the performance of REITs. According to Dusuki (2015), the author reported that mortgage REITs more likely to have negative relationship with market interest rate fluctuations since the it held mortgages which the prices fluctuates opposite direction of interest rates. Besides, Wong (2016) claimed that there is a weak correlation between REITs and the variation of local interest rate where it unable to prove that REITs are pure yield-play instrument. Kola and Kodongo (2017) proved that macroeconomic risk is not fully related to expected return of REITs. However, they found that there is inverse relationship between the conditional covariance and expected returns of REITs portfolio and the uncertain fluctuation of macroeconomic variable such as de-trended short-term interest rates. Other than that, Kawaguchi et al. (2017) identified the volatility implications of equity REIT stock prices and documented a negative leverage effect in the pre and post Greenspan era, but not during the Greenspan era. These scholars claim that the positive elasticity of variance with respect to the value of equity during the Greenspan era can be explained by a decline in the spread between the interest rate on commercial mortgages and 10-year Treasuries.

According to Ahearne et al. (2005), real estate price increased when the central banks tightening monetary policy to influence the economic situations. This shows positive relationship between the money supply and real estate price as it related to the central bank's monetary policy. This is because when the expansionary monetary policy is implemented, the loan-making ability of commercial bank will increase which lead to the increase in money supply in the market. The supply of credit to the real estate sector will increase as well and the demand of real estate will increase lead to the growth in price of real estate (Xu & Chen, 2011). However, it also changes the public inflation expectation which the increase in money supply may lead to inflation due to rising in price of real estate. Besides, the money supply is also affected by the supply of mortgage credit. If the central bank decreases the real estate specific credit policy on mortgage down payment requirements, the mortgage credit supply will increase and lead to increase in real estate price. There is a stronger impact on real estate price growth by the implementation of central bank's monetary policy as compared to deregulated markets (Xu & Chen, 2011).

Furthermore, Lee and Lee (2014) stated that money supply is positive coefficient in United Kingdom and France as an increase in money supply will benefit the investors in which the real estate stock responses to the changes of monetary policy. Besides that, Rushid & Kim (2008) mentioned that money supply has negative relationship with the real estate stock depend on more pro-cyclical monetary policies. According to Lee et al. (2011), there is no evidence found on the influence of money supply to the property stocks in Malaysia and Taiwan as the real estate stock prices are random walk and depend on other factors.

According to the study of Mohamad, Saad and Bakar (2014), Gross Domestic Product (GDP) is one of the key factors that affect REITs return. The authors said that an increment in GDP lead to more cash available to be invested in assets such as real estate. As a country performs well in economy, its GDP will show good statistical pattern and hence this infers the enhancement of overall well-being of a nation. This is supported by the findings of Kamweru and Ngui (2017), in which the increase in GDP results a better performance in real estate industry. Moreover, the Kamweru and Ngui (2017) claimed that GDP per capita plays an important role in examining REITs performance on these countries, such as Hong Kong, Singapore, Japan and United Kingdom. Furthermore, Kamweru and Ngui (2017) concluded that there is a positive correlated relationship between them (Leone, 2010). The findings are in accordance to Liow and Yang (2005), in which the author stated the relation of several macroeconomic risks that includes GDP have long run impact in Asian markets. Besides, the research carried out by Hussin et al. (2012) also mentioned that there is a positive impact of economic growth on Islamic stock market in Malaysia. This is further explained by Azmin and Shariff (2016) highlighted that a growing economy lead to positive impact on REITs value and increase the rental received. In the other word, if countries possess different economic condition, in relation to the REITs return also offers difference level of rates (Alias & C.Y., 2011). Based on the research by Yunus (2012), GDP is one of the factors that drives real estate return positively for ten other international market in the manner of short-term impact, given that the diverse of economic development across countries.

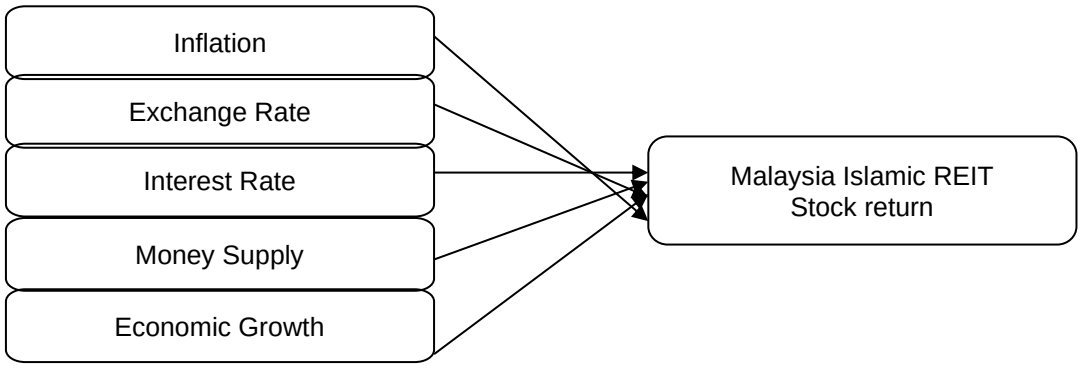

Figure 1: Conceptual Framework

The conceptual framework of this study as illustrated in figure 1, which are intended to guide this research as connection between identified variables and i-REIT stock return in Malaysia. The development of the conceptual framework underpinned by the

literature and empirical finding with the research gap as highlighted in the background of study. Briefly, this study was confined to five variables comprise of inflation, exchange rate, interest rate, money supply and economic growth. Nonetheless, the study derived five hypotheses a proposition that tentatively explain the facts of i-REIT in Malaysia.

RESEARCH METHODOLOGY

Research Design

The study aims to examine the volatility persistence and leverage effect of macroeconomic variables on Islamic REITs stock return. Therefore, the study is based on quantitative research to derive the empirical results of volatility and leverage effect of Islamic REITs stock return. According to Kruger (2003), quantitative data allows the research to replicate the vast amount of information and facilitate comparisons across categories and over time. Secondary data has been chosen to study the relationship between the endogenous and exogenous variables and empirical results are needed to provide for the exogenous variables, which make this research design best suited to the study. The data of endogenous and exogenous variables which is the Malaysian Islamic REITs stock prices and macroeconomic variables are collected from Bloomberg terminal respectively. This study retrieves quarterly data of 52 observations from the period of 2006 to 2018.

The historical stock price of Malaysian Islamic REITs at the end of trading day of March, June, September and December from the period of 2006 to 2018 are collected from Al'Aqar Healthcare REIT, AXIS REIT and KLCC REIT, expressed in Ringgit Malaysia from Bloomberg Terminal. The Al-Salam REIT listed on September 2015 was excluded from the study sample as the sample sizes for the respective i-REIT were less than a minimum of 30 observation period for mean and deviation estimates as specified in the central tendency theorem. In order to calculate the percentage change of i-REIT stock return, the equation is as follows: $\Delta\, i - REIT = \frac{Stock\ price\ t - stock\ price\ t-1}{stock\ price\ t-1}$

Where,

- Δ i-REIT = Percentage changes of i-REIT stock monthly return between $_t$ period and $_{t-1}$ period.
- Stock price $_t$ = The i-REIT closing stock price at end of the trading month $_t$.
- Stock price $_{t-1}$ = The i-REIT closing stock price at end of the trading month $_{t-1}$.

The quantification of macroeconomic variables for this study and the justification of proxy, measurement, unit of measurement and source if data as in Table 2.

Table 2: Malaysia Islamic Real Estate Investment Trusts as at December 2018.

Macroeconomic variables	Proxy	Measurement	Unit of Measurement	Sources of data
Inflation	Consumer Price Index	(Current Period Price of the Basket)/(Base Period Price of the Basket)×100	Index	Statistic Department of Malaysia
Exchange Rate	United State Dollar to Malaysia Ringgit	The quotation price of USD / MYR	Rate	Bloomberg terminal
Interest Rate	Islamic interbank rate	The quotation rate between Interbank	Rate	Bank Negara Malaysia
Money Supply	M3	Short term deposits + money market funds + coins and notes + other liquidity money equivalents	Monetary value	Bank Negara Malaysia
Economy Growth	Gross Domestic Product	Private consumption + gross investment + government investment + government spending + (exports – imports).	Nominal value	Statistic Department of Malaysia

Data Analysis

Unit Root Test

The unit root test is used to determine the order of each of the variable's integration. The series of data are collected to check the stationarity to prevent the result to be invalid. The mean, variance, and covariance of series are constant across different periods which indicate that the variables are in stationary trend (Gujarati & Porter, 2009). Hence, the stationary variables will provide more accurate results as compared to non-stationary variables. Most economists will argue that a macroeconomic time series contains unit root and its fluctuation over time might suggest a non-stationary trend. It is equally important to have a stationary time series to avoid biased results which is called spurious regression (Ling et al, 2013). Hence, the Augmented Dickey-Fuller (ADF) test is used to analyze the stationarity of the variables. Besides, Phillips-Perron (PP) test will also be applied to strengthen the accuracy of result.

Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model

Autoregressive Conditional Heteroscedasticity model is a stationary non-linear model which first proposed by Engle (1982), which is one of the most commonly used method to specify the volatility. The natural extension of the model was extended by Bollerslev (1986) and Taylor (1986) independently called it as GARCH model. This model allows the conditional variances to be independent upon previous own lags to overcome the limitations of ARCH model and make it more realistic. The heteroscedastic features and volatility of parameters can be captured by GARCH model and to reduce the chances of multicollinearity problem between the estimates, it only includes fewer parameters as compared to ARCH model. Furthermore, the GARCH model only can be used if there is a presence of ARCH effect by looking at the F statistics and Obs*R squared (LM statistics). It is the improved version of the ARCH model by combining the MA (moving average). In addition, the volatilities also can be determined by coefficients of final output whether it is affected by new information (α_1) or moving average (α_2) effect by itself. The regression for this study as follow:

$$LnREITs_t = \beta_0 + \beta_1 CPI_t + \beta_2 lnEXC_t + \beta_3 IIR_t + \beta_4 M3_t + \beta_5 lnIPI_t + \varepsilon_t$$

$\varepsilon_t \sim N\ (0, \alpha_0 + \varepsilon_1 \mu^2_{t-1})$

Where,

$LnREITs_t$ = natural logarithm of Malaysia Islamic REITs stock
β_0 = Intercept term
CPI_t = Inflation Rate
$lnEXC_t$ = natural logarithm of exchange rate
IIR_t = Interest Rate
$M3_t$ = Money Supply
$lnIPI_t$ = natural logarithm of economic growth
ε_t = residuals

The GARCH model estimation for this study as follow:

$Y_{j.t} = \mu + \beta_1 \sum_{i=1}^{n} Y_{j,t-1} + \varepsilon_t$

$h_{j,t} = \alpha_0 + \alpha_1 \varepsilon^2_{j,t-1} + \beta\ h_{j,t-1} + \varepsilon_t$

Where,
$Y_{j.t}$ = excess return of Islamic REITs
ε_t = residuals
$h_{j,t}$ = conditional variance
μ, α_0 = constant
α_1 = coefficient of ARCH term
β = coefficient of GARCH term

The persistence of a traditional GARCH model refers to the sum of two parameters, α and β should be less than one. The volatility considered as explosive if the sum is greater than one.

Exponential Generalized Autoregressive Conditional Heteroscedasticity (EGARCH) model

GARCH model is often being used by financial institutions to estimate and measure the volatility of an investments. However, since traditional GARCH models could not detect the leverage effect and explain asymmetry error distribution, which it refers to the impact of the bad news is greater than good news generated on volatility. Therefore, this study employs the extended version of GARCH model proposed by Nelson (1991), Exponential GARCH (EGARCH) model to capture these asymmetric impacts. This modified model is to capture the extent of the effect on future volatility. The variance equation of EGARCH model can be expressed as follows: $log\ \sigma_t^2 = \omega + \alpha_1 \left\{ \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| - \sqrt{\frac{2}{\pi}} \right\} + \beta\ log\ log\ (\sigma_{t-1}^2) + \gamma\ \varepsilon_{t-1}$

Where,
ω = intercept
α_1 = the coefficient of ARCH term at particular time
γ = indicator of leverage effect
β = persistence in conditional volatility

The variance of EGARCH of γ ≥ 0 indicate that the impact of the shocks on the Islamic REITs price is rather asymmetric or the existence of volatility clustering, whereas if γ is negative and significant, this indicates that the leverage effect is present between the endogenous and exogenous variable. In addition, β accounts for the stationarity of a series of data in which to determine the time of the volatility takes to the shocks in the market. (Ezzat, 2012).

DATA ANALYSIS AND DISCUSSION

The empirical analysis utilizing the data collected from Bloomberg complies with the research objectives and is directed by Eviews 10. In addition, unit root test is employed to reduce the chances of the model suffering econometric problems and the Ordinary Least Squares (OLS) method is not efficient and no longer valid to capture the effect of financial data. Hence, GARCH model will be applied that is specifically designed to capture the effect of heteroscedasticity. The ARCH-LM test is applied to ensure the GARCH model is correctly specified and the impacts of each exogenous variable on the three different Islamic REITs will also be carried out. Furthermore, the research also adopted the EGARCH model to capture the leverage effect of macroeconomic variables toward the different three Islamic REITs.

Table 3: Unit Root Analysis

Variables	ADF		PP	
	First Difference		First Difference	
	Without Trend	With Trend	Without Trend	With Trend
LNAQAR	-5.8218(0)***	-5.9423(0)***	-5.8261(1)***	-5.9434(1)***
LNAXIS	-6.4297(0)***	-6.4800(0)***	-6.4328(2)***	-6.4816(2)***
LNKLCC	-4.4033(0)***	-4.3522(0)***	-4.3838(2)***	-4.3355(2)***
CPI	-6.3365(7)***	-7.2787(7)***	-5.8027(4)***	-5.7065(4)***
LNEXC	-5.6093(0)***	-5.5533(0)***	-5.6093(0)***	-5.5612(1)***
IIR	-5.2896(1)***	-5.2883(8)***	-5.2896(0)***	-5.2883(0)***
M3	-6.1379(0)***	-6.0629(0)***	-7.2523(12)***	-7.1051(12)***
LNIPI	-3.842528(3)**	-3.8933(3)**	-5.9578(2)***	-5.8880(3)***

*, **, *** indicates the rejection of the null hypothesis at 10%, 5%, 1% significance levels. Number in parentheses is the number of lags. Lag lengths for the ADF unit root are based on Schwarz information criterion. The bandwidth for the PP unit root is based on the Newey-West estimator using the Default (Barlett kernel).

The unit root tests include time trend and without a linear time trend as in Table 3 the result indicate that all variables are stationary at first differencing. Therefore, the result of ADF and PP test shows that study data achieve stationary and it is reliable to use for the research to strengthen the accuracy. Furthermore, Table 4 shows that the residuals are not serially dependent for all three Islamic REITs by referring the result of Ljung-Box Q-statistics. This result implies that the three models are free from autocorrelation problem and the result of ARCH-LM test indicates that all the models are not suffering heteroscedasticity problems. Therefore, the GARCH model for all Islamic REITs are correctly specified and sufficient to draw a solid conclusion between endogenous variables and Islamic REITs.

Table 4: Ljung-Box Q-statistics

Diagnostics Checking			
Q^2 statistic(1)	0.0123 (0.912)	0.4401 (0.507)	0.3740 (0.541)
Q^2 statistic(15)	8.8465 (0.885)	14.399 (0.496)	21.920 (0.110)
Q^2 statistic(30)	21.906 (0.857)	35.359 (0.230)	38.016 (0.149)
ARCH-LM(1)	-0.01963 (0.1613)	0.096157 (0.1508)	-0.09762 (0.1593)

Table 5: The analysis of GARCH Model for Three Islamic REITs Stock Return

	Aqar REIT	**Axis REIT**	**KLCC REIT**
Conditional Mean Equation			
Constant	-2.8657*** (0.4879)	-3.4517*** (0.4401)	-4.4245*** (0.6285)
CPI	-0.007331 (0.09391)	-0.03306*** (0.0113)	-0.0195*** (0.0075)
LNEXC	0.539371*** (0.1471)	0.50083*** (0.1397)	-0.4393 (0.1917)
IIR	0.05610 (0.03938)	0.2177*** (0.04803)	0.07562 (0.0632)
M3	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)
LNIPI	0.5850*** (0.1018)	0.7249*** (0.09784)	1.0643*** (0.6285)
Conditional Variance Equation			
Constant	0.001489 (0.001828)	0.00135 (0.001733)	0.002486 (0.0.0032)
ARCH term, α	1.25258** (0.5921)	1.2452* (0.695365)	1.1677 (0.7157)
GARCH term, β	0.06932 (0.2398)	0.07816 (0.18597)	0.1066 (0.2428)
Σ α + β	1.32190	1.32336	1.2743

The standard error is reported in parenthesis. ***(**)* denote statistical significant at the 1%, 5%, and 10% levels, respectively

Table 5 shown the result of GARCH Model for three Islamic REITs Stock Return. The GARCH model for Aqar REIT result shows that exchange rate, money supply and economic growth are statistically significant while inflation rate and interest rate are not significant to explaining Aqar REIT stock return at α = 0.01. Furthermore, there is a negative relationship between inflation rate and Aqar REIT stock return, while there is a positive relationship between exchange rate, interest rate, money supply, economic growth and the price of Aqar REIT stock return. The estimated coefficients of ARCH (1.25258) term is significant while GARCH (0.06932) term is not significant in variance equation at the α = 0.05 for GARCH (1,1) model. The volatility persistence of 1.3219 for the price of Aqar REIT stock return is relatively high which is measured by the sum of ARCH and GARCH coefficients. This indicated that the volatility persistence of the price of Aqar REIT is unstable.

The GARCH model for Axis REIT result shows that all exogenous variables are statistically significant to explaining Aqar REIT stock return at α = 0.01. There is a negative relationship between inflation rate and Aqar REIT stock return while there is a positive relationship between exchange rate, interest rate, money supply, economic growth and the price of Aqar REIT stock return. The estimated coefficients of ARCH (1.2452) term is significant while GARCH (0.07816) term is not significant in variance equation at the α=0.1 for GARCH (1,1) model. The volatility persistence of 1.3219 for Axis REIT price is relatively high which is measured by the sum of ARCH and GARCH coefficients. This indicated the variance is non-stationary.

The GARCH model for KLCC REIT result shows that inflation rate, money supply and economic growth are statistically significant while interest rate and exchange rate are not significant. There is a negative relationship between inflation rate and exchange rate towards KLCC REIT stock return, while there is a positive relationship between interest rate, money supply, economic growth and the KLCC REIT stock return. The estimated coefficients of ARCH (1.1677) term is significant while GARCH (0.1066) term is not significant in variance equation at the α=0.01 for GARCH (1,1) model. The volatility persistence of 1.2734 for the price of KLCC REIT is relatively high which is measured by the sum of ARCH and GARCH coefficients. This indicated the variance is explosive.

Table 6: The Analysis of EGARCH model for Aqar REIT Stock Return

Aqar REIT					
	CPI	EXC	IIR	IPI	M3
Conditional Mean Equation					
Constant	0.7038*** (0.05564)	2.3966*** (0.0905)	-0.3374*** (0.06619)	-0.4185*** (0.0615)	0.5190*** (0.01934)
β	0.01909 (0.01645)	-4.3829*** (0.3237)	0.4587*** (0.02446)	0.01106***	$6.83*10^{-6}$***

				(0.0005)	($3.10*10^{-7}$)
Conditional Variance Equation					
Constant	-2.6582 (2.0860)	-2.4917*** (0.9027)	-2.8708*** (0.8709)	-2.9020 (1.8745)	-4.9724*** (1.6445)
ARCH term, α	2.5264 (1.6606)	1.6875* (0.8769)	2.1615*** (0.8338)	1.2487** (0.5837)	1.3445 (0.8884)
Gamma term, γ	0.3082 (0.7939)	-0.3875 (0.5251)	0.06691 (0.57410)	-0.3398 (0.3580)	-0.2140 (0.5027)
GARCH term, β	0.9181* (0.3332)	0.7634*** (0.1884)	0.7051*** (0.1855)	0.5478 (0.4529)	0.1044 (0.3825)

The standard error is reported in parenthesis. ***(**)* denote statistical significant at the 1%, 5%, and 10% levels, respectively

The EGARCH model for Aqar REIT result shows that all exogenous variables except inflation rate are statistically significant to explain the Aqar REIT stock return at α=0.01 as in Table 6. Furthermore, there is a negative relationship between exchange rate and Aqar REIT stock return while there is a positive relationship between inflation rate, interest rate, money supply, economic growth and Aqar REIT stock return. In Table 6, the leverage effects γ for exchange rate, economic growth and money supply are negative and insignificant at α=0.05, indicating that good news generates less volatility of exchange rate, economic growth and money supply than bad news for the price of Aqar REIT stock return.

Table 7: The Analysis of EGARCH model for Axis REIT Stock Return

Axis REIT					
	CPI	EXC	IIR	IPI	M3
Conditional Mean Equation					
Constant	1.6803*** (0.05531)	2.2294*** (0.1821)	-0.4549*** (0.1603)	-0.2446* (0.1344)	0.9770*** (0.03635)
β	-0.01432 (0.02306)	-2.5318*** (0.6290)	0.6845*** (0.0534)	0.01260*** (0.001164)	$7.18*10^{-6}$*** ($4.93*10^{-7}$)
Conditional Variance Equation					
Constant	-1.4253** (0.6900)	-2.3667*** (0.8259)	-2.5348*** (0.6363)	-2.8537 (1.7540)	-2.8018* (1.6270)
ARCH term, α	0.6354 (0.4429)	1.7784** (0.8759)	1.6734*** (0.5769)	1.5363** (0.6454)	1.4798*** (0.5762)
Gamma term, γ	-0.6137* (0.3157)	-0.1603 (0.5458)	-0.6246 (0.4853)	-0.03740 (0.3925)	-0.3981 (0.3833)
GARCH term, β	0.7779*** (0.1428)	0.7182 (0.2571)	0.7030*** (0.1581)	0.5614 (0.4342)	0.5176 (0.4408)

The standard error is reported in parenthesis. ***(**)* denote statistical significant at the 1%, 5%, and 10% levels, respectively

The EGARCH model for Axis REIT result is shown in Table 7. The analysis shows that all exogenous variables are statistically significant to explain the price of Axis REIT at α=0.01 except inflation rate. There is a negative relationship between inflation rate, exchange rate and Axis REIT stock return. On the other hand, there is a positive relationship between exchange rate, interest rate, money supply, economic growth and the Axis REIT stock return. Furthermore, in Table 7, the leverage effects γ are negative for all variables that are insignificant at α=0.05, which means that negative shock raises more volatility than positive shocks for the price of Axis REIT stock return.

Table 8: The Analysis of EGARCH model for KLCC REIT Stock Return

KLCC REIT					
	CPI	EXC	IIR	IPI	M3
Conditional Mean Equation					
Constant	2.3558*** (9.7*10)	18.7034*** (1.1544)	2.0592*** (0.1653)	-5.2460*** (0.8685)	2.2276*** (0.1362)
β	-0.0769*** (0.0000)	-50.1354*** (3.7623)	0.1153* (0.06141)	0.07622*** (0.006986)	$3.94*10^{-5}$*** ($1.88*10^{-6}$)
Conditional Variance Equation					
Constant	0.7474*** (0.0000)	-1.5330*** (0.5637)	-2.01382 (1.2774)	-0.9624 (0.6940)	-0.8742 (0.5841)
ARCH term, α	-1.0149*** (0.0000)	1.8318** (0.7346)	2.1121* (1.2453)	0.7831 (0.7496)	0.8093 (0.5258)
Gamma term, γ	0.6482*** (0.002046)	0.3248 (0.4679)	0.7975 (0.8255)	0.3004 (0.3687)	-0.3176 (0.3496)
GARCH term, β	0.9023*** (0.0000)	0.7561** (0.3186)	0.7265*** (0.2711)	-0.2608 (0.7840)	0.6355 (0.4204)

The standard error is reported in parenthesis. *** (**)* denote statistical significant at the 1%, 5%, and 10% levels, respectively.

In Table 8, KLCC REIT result shows that all variables are statistically significant to explain KLCC REIT stock return at α=0.10. Furthermore, there is a negative relationship between inflation rate, exchange rate and KLCC REIT stock return while there is a positive relationship between interest rate, money supply, economic growth and KLCC REIT stock return. Moreover,

in Table 8, the leverage effect of money supply is negative and insignificant at α=0.05, which means that negative shock generates higher volatility of money supply than positive shocks for the price of KLCC REIT stock return.

Table 9: Summary of Analysis for GARCH and EGARCH Model

	Aqar REIT	**Axis REIT**	**KLCC REIT**
Volatility Persistence	1.32190	1.32336	1.2743
	Relationship		
Inflation rate	**-**	**-**	**-**
Exchange rate	**+**	**+**	**-**
Interest rate	**+**	**+**	**+**
Money supply	**+**	**+**	**+**
Economic growth	**+**	**+**	**+**
	Leverage Effect		
Inflation rate	NO	YES	NO
Exchange rate	YES	YES	NO
Interest rate	NO	YES	NO
Money supply	YES	YES	YES
Economic growth	YES	YES	NO

(+) show positive relationship while (-) show negative relationship. (YES) indicated that positive shock or good news accruing toward i-REIT volatility while (NO) negative shock or bad news accruing toward i-REIT volatility.

In table 9, all the three Islamic REITs exhibit an unstable behavior in such a way that the sum of alpha and beta is more than 1, the volatility would take a longer time to respond to a shock in the market. Nevertheless, the magnitude of changes in price level of Islamic REITs tends to be greater in responding to new market information. On the other hand, inflation rate is deemed to have a negative relationship with all the three Islamic REITs stock return. This negative evidence is consistent with Marfatia, Gupta and Cakan (2017), who mentioned that inflation is one of the financial issues that concerns economists across the world. On the volatility persistence, the finding is the same with Ewing & Payne (2005) and Nishigaki, (2007) that a slow adjustment of stock price caused by expectations of price shock might be unable to perform in sustained periods. Furthermore, the analysis shows that inflation rate has no leverage effect on Aqar REIT and KLCC REIT. It argued that the stock prices of REITs react significantly when it declines during the period as compared to the rise in prices in a similar manner. For instance, bad news generates the shock magnitude to the Islamic REITs model. On the other hand, Axis REIT stock return is influenced by the good news accruing toward stock return volatility. Therefore, it is essential for policy makers to intervene by carrying out monetary policies to minimize the effect of inflation especially on the bad news in regard to the inflation indicator.

The exchange rate shows a positive relationship with the Aqar and Axis REITs stock return, while KLCC REITs have a negative relationship. The empirical studies by Maysami and Koh (2000) and Ibrahim and Aziz (2003) argued that the appreciation of the currency of a country will lead to the increase of REIT's stock price, and foreign investors need more of their local currency to exchange for foreign currency for the REIT stock purchases. However, Ajayi and Mougoue (1996) and Ngo (2016) stated that the negative relationship between the exchange rate and REITs' stock return is because foreign investors might find out that it is much more expensive to invest in foreign REITs due to foreign exchange rate volatility. In table 9, the exchange rate has leverage effect with Aqar and Axis REITs, but not KLCC REITs. Therefore, government intervention on a country's exchange will keep the currency rate fluctuating in a desired range. The positive shock of the exchange rate is sensitive to Islamic REITs stock price.

On the interest rate, it shows a positive relationship with the three Islamic REITs. The result is consistent with the study of Mohamad (2016) and Yusuf, Hussin & Ramli (2015). The rationale behind this result is explained by investors receiving higher returns when there is adjustment on interest rate. Furthermore, investors may be attracted to the high interest of Islamic REITs and the demand for it leads to increase in REIT's stock prices. On the other hand, interest rate has no leverage effect on Aqar and KLCC REITs, but it does on Axis REIT. Therefore, there is a sudden shock in the REITs stock price when the interest rate decreases, hence the government tends to implement monetary policy within the range, and it leads to sustainability of economy.

The analysis in table 9 shows that money supply affects the three Islamic REITs stock return. The result is consistent with the research of Ahearne et al. (2005). They reported that by implementing the monetary policy, it will lead to the increase in money supply and promote overall demand growth and furthermore to higher real estate prices. Specifically, expansionary monetary policy will be deployed by losing the loan requirement to encourage lending and investment to create upward pressure on the money supply available in the economy. This is further explained by Xu and Chen (2011) by highlighting that the supply and demand force is the key element to the growth in the price of real estate. In addition, the evidence also correlates to the study of Lee and Lee (2014), who emphasized that money supply is a significant coefficient in UK and France real estate markets. This implied that there is a direct relationship between these two variables in such a way that good news influenced stock price volatility dramatically. The rationale is that an increase of mortgage loan creates more opportunities to invest in real estate market as huge amount of money circulates in the economy. Furthermore, real estate market is deemed to be a safe investment and it boosts investors' confidence.

According to Bouchouicha and Ftiti (2012), GDP growth of a country has a positive relationship with the price level of property and equity stocks. Higher economic growth indicates a nation's well-being is strengthened. This leads to more cash being available to be pumped into asset investment, for instance, real estate industry. This is also in accordance with the study of Mohamad, Saad and Bakar (2014) by highlighting that REIT stock price is determined by the GDP growth as key factor. There are more evidences that can be found in the studies of Leone (2010), Liow & Yang (2005), and Hussin et al. (2012) who mentioned that a positive impact on REIT stock price is influenced by a growing state of economy and generated rental collection. In addition, table 9 shows that economic growth has leverage effect on the

price of Aqar and Axis REIT, but not KLCC REIT, as GDP usually acts as the yardstick of measuring economic development of a country. Theoretically, higher economic growth will result in an increase in residents' incomes. Then, they tend to spend more on luxury goods for example, in the real estate industry which is claimed to be a profitable investment. This allows the demand to rise and subsequently, higher prices on the real estate. This further demonstrates that the health of the economy reflects on the real estate market.

CONCLUSION

In a nutshell, the economic development of Malaysia has been significantly boosted by the improvement of Islamic finance witnessed in recent years. The relationship among the various macroeconomic variables and Malaysian Islamic REITs in the Malaysian economy should be given necessary attention by researchers to make sure that the stability of Islamic stock improves and therefore remains competitive to drive the economic growth of the country. Therefore, the objectives of this study and its findings are not only important to academicians and investors, but also to policy makers. It is the hope of the researcher that this study will deepen the knowledge of investors and those looking to invest in real estate. To policy makers, this study provides the knowledge for formulating economic and government policies necessary for stabilizing and stimulating the economy of a country. Nevertheless, this study provides a discussion of Islamic finance to set a basis for Malaysian Islamic REIT, the regulatory framework, and conceptual model property trust funds in Malaysia. This review lays a theoretical framework for establishing the study relevance and foundation basis and contribution to the Islamic finance literature review.

REFERENCES

1. Ahearne, Alan, G., Ammer, John, Doyle, Brian, M., et al. (2005). House prices and monetary policy: a cross country study, board of governors of the Federal Reserve System. *International Finance Discussion Papers*.
2. Ahmad R., Nurul A., Muhammad R., & Hishamuddin A. (2015). The Potential of Islamic Real Estate Investment Trusts In Malaysia. *PERINTIS E-Journal, 5*(2), 13-30.
3. Allen, M. T., Madura, J. & Springer, T.M. (2000). REIT characteristics and the sensitivity of REIT returns. *Journal of Real Estate Finance and Economics, 21*(2), 141-152.
4. Azmin, N. A. M., & Shariff, A.M. (2016). The Relationship of Macroeconomic Variables with REITs' Performance: The Case of Malaysian Companies. *Journal of Applied Environmental and Biological Sciences, 6*(6S), 1-7.
5. Beg, A. & Anwar, S. (2012). Detecting volatility persistence in GARCH models in the presence of the leverage effect. *Quantitative Finance*, 1-9.
6. Chen, Y.S. & Wang, S.T. (2006). The empirical evidence of the leverage effect on volatility in international bulk shipping market. *Maritime Policy and Management,* 31(2), 109-124.
7. Diebold, F.X. (1986). Modelling the Persistence of Conditional Variances: a Comment. *Econometric Reviews*, 5, 51–56.
8. Dusuki, A. W. (2015). Practice and Prospect of Islamic Real Estate Investment Trusts (IREITs) in Malaysian Islamic Capital Market. *Journal of Islamic Economics, Banking and Finance, 6*(2), 25-40.
9. Ewing, B. & Payne, J. (2005). The response of real estate investment trust returns to macroeconomic shocks. *Journal of Business Research, 58*(3), 293-300.
10. Fakhfekh, M., Hachicha, N., Jawadi, F., Selmi, N. & Cheffou, A. I. (2016).Measuring volatility persistence for conventional and Islamic banks: An FI-GARCH approach. *Emerging Markets Review,* 27, 84-99.
11. Fang, H., Chang, T. Y., Lee, Y. H., & Chen, W. J. (2016). The impact of macroeconomic factors on the real estate investment trust index return on Japan, Singapore and China. *Investment Management and Financial Innovations, 13(4-1),* 242-253.
12. Gatheral, J. (2011). The volatility surface: a practitioner's guide (Vol. 357). John Wiley & Sons.
13. Gujarati, D. N. & Porter, D. C. (2009). Basic econometrics (5th ed). USA: McGraw-Hill. Boston, MA: McGraw-Hill/Irwin.
14. Hamzah, A. H., Rozali, M. B., & Tahir, I. M. (2010). Empirical investigation on the performance of the Malaysian real estate investment trusts in pre-crisis, during crisis and post-crisis period. *International Journal of Economics and Finance*, *2*(2), 62-69.
15. Hussin, M. Y. M., Husaini, N. H., Muhammad, F., Razak, A. A., & Hadi, F. S. A. (2017). Integration of Islamic real estate investment trusts in Malaysia: Is it an issue for investors?. Geografia: *Malaysian Journal of Society and Space*, 12(7).
16. Hussin, M. Y., Muhammad, F., Razak, A. A., Hadi, F. S., & Gan, P. (2017). The Role of Macroeconomic Variables in the Islamic Real Estate Investment Trusts (I-REIT) Market in Malaysia. *International Journal of Academic Research in Business and Social Sciences, 7*(4).
17. Hussin, M.Y., Muhammad, F., Abu, M.F. & Awang, S.A. (2012). Macroeconomic Variables and Malaysian Islamic Stock Market: A Time Series Analysis. *Journal of Business Studies Quarterly, 3*(4), 1-13.
18. Ibrahim, M. H., & Aziz, H. (2003). Macroeconomic variables and the Malaysian equity market: A view through rolling subsamples. *Journal of Economic Studies, 30*(1), 6-27.
19. Kamweru, E., & Ngui, M. (2017). Effects of Interest Rates on the Performance of Real Estate Industry in Kenya: A Case of Nairobi County. *International Journal of Finance, 2*(6), 35-39.
20. Kawaguchi, Y., Sa-Aadu, J., & Shilling, J. D. (2017). REIT Stock Price Volatility and the Effects of Leverage. *Real Estate Economics*, *45*(2), 452-477.
21. Kola, K., & Kodongo, O. (2017). Macroeconomic risks and REITs returns: A comparative analysis. *Research in International Business and Finance, 42*, 1228-1243. doi:10.1016/j.ribaf.2017.07.061
22. Kruger, D. J. (2003). Integrating quantitative and qualitative methods in community research. *The Community Psychologist*, *36*(2), 18-19.
23. Laws of Malaysia. (2006, April 6). Income Tax Act 1967. Retrieved from http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act 53.pdf
24. Lee, C. L. & Lee, M. L. (2014). Do European real estate stocks hedge inflation? Evidence from developed and emerging markets. *International Journal of Strategic Property Management, 18*(2), 178–197.
25. Lee, Y., & Pai, T. (2010). REIT volatility prediction for skew-GED distribution of the GARCH model. *Expert Systems with Applications*, 37, 4737-4741.
26. Leone, V. (2010). From Property Companies to Real Estate Investment Trusts: The Impact of Economic and Property Factors in the UK Commercial Property Returns. *SSRN Electronic Journal*. doi:10.2139/ssrn.1651082
27. Ling, T. Y., Nor, A. H., Saud, N. A., & Ahmad, Z. (2013). Testing for Unit Roots and Structural Breaks: Evidence from Selected ASEAN Macroeconomic Time Series. *International Journal of Trade, Economics and Finance,* 230-237. doi:10.7763/ijtef.2013.v4.292
28. Liu, J., Loudon, G. and Milunovich, G. (2012). Linkages between international REITs: the role of economic factors. *Journal of Property Investment & Finance, 30*(5), 473-492.
29. Loo .W. K., M. A. Anuar, and S. Ramakrishan. (2016).Integration between the Asian REIT markets and macroeconomic variables. *Journal of Property Investment and Finance 34*, 68-82.

30. Malaysia International Islamic Finance Centre. (2013). Islamic Real Estate and Investment Trusts. A promising asset class for wealth management. Retrieved from http://www.mifc.com/index.php?ch=28&pg=72&ac=60&bb=uploadpdf
31. Marfatia, H. A., Gupta, R., & Cakan, E. (2017). The international REIT's time-varying response to the U.S. monetary policy and macroeconomic surprises. *The North American Journal of Economics and Finance, 42*, 640-653.
32. Maysami, R. C., & Koh, T. S. (2000). A vector error correction model of the Singapore stock market. *International Review of Economics & Finance*, *9*(1), 79-96.
33. Mitra, S. (2009). A Review of Volatility and Option Pricing. Retrieved July 8, 2018, from https://arxiv.org/pdf/0904.1292.pdf
34. Mohamad, N. (2016). The Performance of Shariah Real Estate Investment Trust and Conventional Real Estate Investment Trust in Malaysia. *Indonesian Capital Market Review, 8*, 1-11.
35. Mohamad, N. E., Saad, N. M., & Bakar, S. (2014). Risk and Real Estate Investment Trust (REITs) Return: Evidence from Listed Public Trust. *Indonesian Capital Market Review, 3*(1). doi:10.21002/icmr.v3i1.3620
36. Moniruzzaman, M., & Farzana, K. F. (2018). Malaysia'14th General Election: End of an epoch, and beginning of a new?. *Intellectual Discourse*, *26*(1), 207-228.
37. Nishigaki, H. (2007) An analysis of the relationship between US REIT returns. *Economics Bulletin, 13* (1), 1-7
38. Olweny, T. & Omondi, K. (2011). The Effect of Macro-economic factors on Stock Return Volatility in the Nairobi Stock Exchange, Kenya. *Economics and Finance Review*, 1(10) , 34 -48.
39. Ong T.S., The B.H., & Chong M.P. (2011). A study on the performance of Malaysian real estate investment trusts from 2005-2010 by using net asset value approach. *International Journal of Economics Resources*, *2*(11), 1-15.
40. Osmadi, A., & Razali, M. N. (2014). Assessing the Financial and Management Strength of Islamic Real Estate Investment Trusts (I-Reits) During The Global Financial Crisis (Gfc). *PERINTIS E-Journal, 4*(1), 48-69.
41. Owusu-Nantwi, V., & Kuwornu, J. K. (2011). Analyzing the effect of macroeconomic variables on stock market returns: Evidence from Ghana. *Journal of Economics and International Finance*, *3*(11), 605-615.
42. Pham, A. K. (2012). The dynamics of returns and volatility in the emerging and developed Asian REIT markets. *Journal of Real Estate Literature*, *20*(1), 79-96.
43. Preis, T., Kenett, D. Y., Stanley, H. E., Helbing, D., & Ben-Jacob, E. (2012). Quantifying the behavior of stock correlations under market stress. *Scientific reports*, *2*, 752.
44. R. Schiller. (1981) The Uses of Volatility Measures in Assessing Market Efficiency. *Journal of Finance*, *36*(2):291–304.
45. Ripian N., Ahmad N.W. (2016). The Performance of Islamic REITs in Malaysia: Case of Al- 'Aqar Healthcare REIT. *Proceeding of the 2nd International Conference on Economics & Banking 2016*. Kolej Universiti Islam Antarabangsa Selangor.
46. Rozman, A. T., Azmi, N. A., Ali, H. M., & Razali, M. N. (2015). The performance and significance of Islamic REITs in a mixed-asset portfolio. *Jurnal Teknologi*, *77*(26), 1-9.
47. Rushid, M. & Kim, J. H. (2008). In long run relationship between real estate stock return and inflation in Australia. *37th Australian conference of economists, Queensland*, Australia.
48. San Ong, T., Teh, B. H., Soh, C. H., & Yan, Y. L. (2012). Malaysian real estate investment trusts: a performance and comparative analysis. *International Journal of Economics and Finance*, *4*(5), p73.
49. Securities Commission Malaysia. (2005, November 21). Guidelines for Islamic Real Estate Investment Trusts. Retrieved from https://www.sc.com.my/guidelines-forislamic-real-estate-investment-trusts/
50. Securities Commission of Malaysia (2018). Commission Annual Report 2017. Securities Commission, Kuala Lumpur.
51. Siemann, C. (2011). Promoting Equity for REIT Investors. Seton Hall Legis. J., 36, 271.
52. Sing, T. F., Tsai, I. C. & Chen, M. C. (2012). Volatility Persistence in Equity REIT Market. *Research Gate*.
53. Suska, J. (2015). Modelling leverage effect in a financial time series. Retrieved from: www.wneiz.pl/frfu.
54. Wednesday, 17 Jul 2019 REITs sector likely to have bumpy ride, Read more at https://www.thestar.com.my/business/business-news/2019/07/17/reits-sector-likely-to-have-bumpy-ride/#HCoDthyj07moRhKl.99
55. Wong, M. Y. (2016). Malaysia REITs: First Decade Development and Returns Characteristics. *International Real Estate Review, 19*(3), 371-409.
56. Xu, X. E. & Chen, T. (2011). The effect of monetary policy on real estate price growth in China. *Pacific-Basin Finance Journal, 20,* 62-77.
57. Yusuf, Y. A., Hussin, M. M., & Ramli, N. R. (2015). Amanah Pelaburan Hartanah Islam (I-REIT) di Malaysia: Analisis hubungan keseimbangan dengan pemboleh ubahmakroekonomi. *Malaysian Journal of Society and Space, 11*(4), 60-73.
58. Zainuddin, Z., & Nordin, N. (2016). Addressing Governance Issue in Islamic Real Estate Investment (I-Reits): A Case Study for Oic Country -Malaysia. *International Journal of Islamic Business, 1*(1), 60-75.
59. Zhou, J., & Kang, Z. (2011). A comparison of alternative forecast models of REIT volatility. *Journal of Real Estate Finance and Economics*, 42, 275–294.