Performance, Integration, and Resilience: An Empirical Analysis of Malaysian REITs

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Mahfuzur Rahman[1]

Leong Jeih How[2]

Syed Faisal Shah[3]

Mohamed Albaity[4]

Abstract

This study empirically investigates the performance dynamics and strategic investment implications of Malaysian Real Estate Investment Trusts (M-REITs) within an evolving financial landscape. Utilizing data from 2005 to 2018, the research employs regression and correlation analysis to evaluate M-REIT performance through dividend yield and total returns. The study is innovatively structured across two dimensions: it segments the data into sub-periods to assess the impact of the Global Financial Crisis (GFC). It conducts a comparative panel analysis between Conventional and Islamic REITs. The analysis reveals that M-REITs provide superior dividend yields compared to government bonds and private debt securities, affirming their appeal for long-term investors. Furthermore, while domestic equity markets show a strong correlation with M-REIT returns, a significant positive relationship exists with regional REIT markets, particularly Singapore (S-REITs), indicating a level of regional integration. The paper offers original value by providing a novel dual-perspective on the market, yielding actionable strategic insights for investors seeking diversification and stable income, and highlighting the strategic importance of regional linkages and the unique Islamic finance component within the REIT structure.

Keywords

Malaysian REITs (M-REITs), Strategic Investment, Dividend Yield, Financial Crisis, Islamic Finance, Regional Integration, Correlation Analysis.

[1,4]Department of Finance and Economics, College of Business Administration, University of Sharjah, Sharjah 27272, United Arab Emirates
[2]Faculty of Business and Economics, University of Malaya, 50603 Kuala Lumpur, Malaysia
[3]Westminster International University, Uzbekistan
Corresponding author:
Mahfuzur Rahman, Email: mrahman@sharjah.ac.ae

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Introduction

Real Estate Investment Trusts (REITs) were established in the United States in 1960, providing investors with access to income-producing real estate. The global REIT industry has since expanded to 37 countries, reaching a collective market capitalization of nearly US$1.7 trillion by the end of 2018 (EYGM Limited, 2018). Japan introduced modern REITs in Asia, followed by significant growth in Hong Kong and Singapore. Despite challenges from the global financial crisis, major Asian economies have seen considerable expansion in their REIT markets. REITs narrow the gap between average and wealthy investors by allowing average investors to participate in large-scale commercial, residential, and industrial properties, which high-net-worth individuals or funds previously dominated. REITs generate steady long-term returns from income-producing real estate, including shopping malls, hospitals, plantations, industrial properties, warehouses, hotels, and office blocks. They offer investors innovative financial instruments combining stock market liquidity with bond-like yields, serving as an alternative to fixed deposits.

Although Malaysia's equity market capitalization is relatively small compared to Japan, Singapore, and Australia, it was the first Asian country to pioneer REITs through listed property trusts (LPTs). The first LPT, Arab Malaysian First Property Trust, was listed on Bursa Malaysia three decades ago, followed by Amanah Harta Tanah PNB. However, growth stalled until Amanah Harta Tanah PNB2 was listed in 1997. During the Asian financial crisis of 1997 1998, LPTs failed to keep pace with economic recovery due to restrictive investment guidelines, unfavorable tax policies, small capital values, and a weakened Malaysian Ringgit, which limited new acquisitions and led to perceived slow returns.

In 2005, the Securities Commission Malaysia introduced practical guidelines to strengthen the legal framework and corporate governance for newly rebranded M-REITs. Since then, the market has grown significantly - from three REITs with a market capitalization of RM 1.8 billion in 2005 to 18 REITs valued at RM 46.48 billion by December 2017 (Securities Commission Malaysia, 2017). Despite promising performance, underlying challenges remain, including increased asset disposals in 2019 to improve cash flow, reduce leverage, and address oversupply in the commercial real estate market. M-REITs perform best when property values rise, though broader economic factors influence stock prices. As trust funds, REITs are often compared to stock markets and yield-based investments like government and corporate bonds (Lean & Smyth, 2012; Mueller & Pauley, 1995; Wejendra & Wong, 2017). Malaysian investors commonly benchmark M-REIT returns against Malaysian Government Securities (MGS). Technological advancements have made it easier for investors to diversify regionally. Disruptive technology allows Malaysians to access major global markets quickly, making regional factors significant drivers of M-REIT performance. External elements such as monetary policy, fiscal policy, and government regulations also impact REIT market growth (Liow & Zhou, 2012; Ambrose & Linneman, 2001; Stevenson, 2013).

Although REITs have a long history in the U.S., Japan was the first Asian country to establish a REIT market in 2000, followed by Singapore, South Korea, Thailand, Taiwan, Malaysia, and Hong Kong. Since rebranding in 2005, Malaysian REITs have grown significantly, offering stock-like liquidity and bond-like yields. While REITs in developed markets like the U.S., Australia, and Europe are well-researched and supported by trade associations (e.g., NAREIT, EPRA), Bursa Malaysia only launched a REIT Index in October 2017 to benchmark M-REIT performance. Although M-REITs are unique in including both conventional and Islamic REITs, research on the market remains limited. Previous studies include Ting's (1999) analysis of pre-rebranding LPT returns and Wong's (2015) examination of M-REITs from 2005 to 2013.

This study extends the observation period to 2018, analyzing the dynamic interrelations between M-REITs, interest rates, equity markets, and regional REIT markets, thereby building on earlier work by Ting (1999) and Wong (2015).

REITs are innovative financial vehicles offering alternative investment opportunities. Globally, REITs reached approximately US$1.7 trillion, with the U.S. market alone valued at US$1.15 trillion in 2017 (EYGM Limited, 2018). Although M-REITs have a smaller market capitalization than established markets, this research analyzes their dynamic relationships, focusing on the evolution of global and Asian REIT markets and the impact of Malaysian government regulations (Newell & Osmadi, 2010). The study evaluates the industry up to 2018, examining connections among M-REITs, interest rates, equity markets, and global REITs using regression analysis to explore variable interactions.

The subsequent section reviews relevant literature to address these objectives and introduces the proposed research hypotheses. This is followed by a detailed presentation of the research methodology and data analysis procedures. The paper concludes with a discussion of the findings and the conclusion.

Literature Review

Performance of Conventional and Islamic M-REITs

Prior studies from Newell & Osmadi (2010) found that conventional REITs and Islamic REITs showed no difference in returns. Conversely, Muhammad N. (2016) stated that Islamic REITs outperformed conventional REITs due to Shariah principles nurturing competitive advantages for Islamic funds. A study comparing returns between conventional and Islamic REITs in major stock exchanges, including London, Singapore, and Malaysia, found empirical evidence that non-Shariah-compliant REITs showed significantly higher returns than Shariah-compliant REITs relative to US interest rates (Morad & Masih, 2015). In line with these studies, this study empirically investigates conventional and Islamic REITs by separating the data into two panels to compare their performance and returns. Dividend performance, capital returns, correlation analysis, and regression analysis are the determinants of investigation that will lead to the conclusion in a later section.

Performance of M-REITs in Pre-, During, and Post-Global Financial Crisis (GFC) Period

Globally, the recent financial crisis has affected most of the world's economies. During the GFC, the Malaysian stock exchange, FBMKLCI, experienced a 45% drop in its index, which reduced investor confidence. Investors were affected and worried about their investments in the Malaysian capital market, with some even expecting the collapse of certain economies. Using the Treynor and Sharpe ratios to measure REIT portfolio performance, Lee & Leong (2015) concluded that the effect of the GFC was insignificant on the performance of M-REITs. Conversely, a similar research methodology using the Treynor and Sharpe ratios by Ong (2012) found that most M-REITs underperformed their market portfolio in the pre-, during, and post-GFC periods.

Other comprehensive research conducted by Yuksel, Asli, Umit, and Hakki (2017) in major European countries such as France, Germany, and the UK found an inconsistent correlation between REITs and the GFC. A global REIT market analysis covering North America, Europe, Africa, the Middle East, Asia Pacific, and Oceania clearly showed global REIT markets' contagion (Chang & Chen, 2014). However, these findings require further investigation because imbalanced market capitalization between Europe and the Asia Pacific exhibits different propagation mechanisms; therefore, this research fills the gap by uncovering the dynamic inter-relationship between independent variables and M-REITs during the sub-periods of the GFC.

Dividend Yields and Total Returns

There is a lack of supporting research on M-REITs that focuses on two important questions for average investors: what is the profitable growth if investors invest in REITs, and what are the total returns for investors who invest in M-REITs from 2005 to 2018? Since the research by Ting (1999) on listed property trusts in Malaysia from 1991 to 1997, no further research has used total returns to assess M-REITs' performance. Moss & Prima (2014), using annualized returns to study REIT performance in Asian markets, found that Malaysia's REIT annualized returns pre-GFC, during GFC, and post-GFC were relatively stable at 13.2%, -12.9%, and 19.3%, respectively. Thus, this research fills the gap by studying M-REIT performance after rebranding in 2005, using the methodology of total capital returns and annualized returns from previous studies.

M-REITs and Interest Rates

Correlation analysis of REIT markets has been conducted and well-publicized in many financial literatures. An intensive study by Ling, Webb, and Myers (2003) on the US REIT market analyzed seven interest rate proxies widely used in REIT literature. The OLS results for the entire 27-year sample period suggest that only changes in bond yields (particularly HIGH) have a significant impact on the returns of equity REITs. However, other interest rates and indices, such as long-term corporate bonds and NASDAQ/NYSE/ASE indices, have an insignificant impact on US REITs. Mueller & Pauley (1995), who conducted research on the United States REIT market with long-term,

medium-term, and short-term interest rates, discovered that REIT price movements had a low correlation with changes in interest rates and a low correlation with the stock market. However, their findings from the US financial market were based on historical data collected from 1972 to 1993. In Australia, a study on the impact of interest rate movements on A-REITs across three economic cycles, before, during, and after the GFC, found that before the GFC, A-REITs did not exhibit sensitivity to interest rate movements. In addition, long-term interest rates significantly negatively impacted A-REIT returns (Chang & Chen, 2014).

In the Malaysian context, many researchers have used correlation analysis to examine M-REITs' performance (Wong, 2015; Lean & Smyth, 2012). Lean & Smyth (2012) showed dynamic linkages between REITs, interest rates, and stock prices in Malaysia from 2006 to 2009. Their study was consistent with a spiraling upturn in both interest rates and stock markets; however, a decline in the stock market could burst the Malaysian real estate bubble. Contradictory research results from Wong (2015) indicate that M-REIT returns are insignificantly correlated with changes in interest rates and are only partially correlated with changes in the long-term interest rate rather than the short-term interest rate. Thus, this research reassesses M-REIT returns by replicating the research methodology from Wong (2015) with an extended observation period from 2005 to 2018 to fill the research gap on the dynamic relationship between M-REITs and interest rate proxies.

M-REITs and Equity Market

M-REIT returns are significantly and positively correlated with changes in the local equity market (Wong, 2015). In global REIT research, most researchers have focused on correlation analysis, volatility, and NAV approaches to examine REIT performance. The National Association of Real Estate Investment Trusts (NAREIT) reported an update on REIT correlations in 2017, stating that the correlation of Equity REIT returns is always different from non-REIT stocks, providing an experienced trader’s insight into the global REIT market. Research found that global and US REITs are not perfectly correlated with the equity market, although they provide similar liquidity advantages (Case, 2017).

According to Lee, Chien, and Lin (2012), when examining the causal relationship between Taiwan REITs and the stock market, they found that individual T-REITs reflected the shock effect from the subprime mortgage crisis. However, the results were complex, as some REITs led while others lagged in stock price indices due to different business natures and market capitalization. Prior studies showed that stock market indices correlate with REIT price movements through the wealth effect and the credit-price effect. The wealth effect explains that investors who profit from the stock market will diversify their investments into REITs and real estate. The credit-price effect indicates that when real estate prices increase, REIT companies will have significant unrealized capital gains, leading investors to bid up the stock value of the REIT firm (Lean & Smyth, 2012).

M-REITs and Global REIT Markets

REIT markets have remained relatively strong through multiple crises, providing steady dividends and income to unitholders. Case (2018) showed a low correlation between different REIT markets and concluded that REITs bring diversification benefits to investors. REITs pose a unique multiple-layer diversification. Through REITs, investors can access different real property investments, asset location diversification, and REIT types (conventional or Islamic). A global REIT strategy offers additional diversification, providing access to different currencies, regulatory frameworks, economic cycles, and monetary policies. Akinsomi, Coskun, Gil-Alana, & Yaya (2018) investigated international REIT markets in BRICS (Brazil, Russia, India, China, and South Africa) and discovered that individual REIT indices had a high degree of persistence between BRICS and three other developed REIT markets (Australia, the United States, and the United Kingdom).

Hypothesis Development

REITs are financial instruments that provide stable income to investors and offer liquidity benefits similar to the equity market. Although REITs conform to the characteristics of stocks, they also provide steady dividends with characteristics similar to yield-based instruments like bonds. This study provides several implications of REITs for stakeholders such as investors, researchers, monetary policy makers, and bankers. When investors assess stocks or REITs, fundamental and technical analysis are used to investigate their intrinsic value. In this study, distribution yields and total returns are important REIT performance indicators (Bursa Malaysia, 2018; Jakpar, Tinggi, Tak, & Ruzlan, 2018; Newell & Osmadi, 2010). Therefore, the development of the first hypothesis replicates the methodology of Ting (1999) to make a comparative analysis of the total returns of listed property trusts. Additionally, the methodology of using dividend yield to compare M-REIT performance follows Olanrele, Said, and Daud (2015). The following hypothesis is formed accordingly:

H1: Dividend yields and total capital returns are outperformance indicators when comparing M-REITs with bonds.

A strengthening US dollar typically exerts upward pressure on the Kuala Lumpur Interbank Offered Rate (KLIBOR) and Interest Rate Swaps (IRS). These determinants could indirectly affect Malaysian Government Securities (MGS) yields. REIT prices are based on yield spreads; thus, an increase in the risk-free rate will affect the REIT outlook. Unitholders usually expect lower REIT prices or indices when the risk-free rate is higher, given that REITs are sensitive to interest rate movements. The development of the second hypothesis replicates the prior methodology of Wong (2015) and Ling, Webb, and Myer (2003). The following hypothesis is formed accordingly:

H2: There is a significant and negative relationship between changes in interest rates and M-REIT returns.

According to research by Liow & Zhou (2012) on Asian REIT markets, stock markets, global REIT market volatility, direct property market returns, and global stock market returns were correlated with the China REIT market. Studies on Malaysian REITs show that M-REITs strongly correlate with the local stock market and property sector indices. Furthermore, M-REIT returns showed a significant correlation with S-REIT returns. Thus, correlation analysis is performed to empirically investigate M-REITs, leading to the following hypotheses, replicating the research methodology of Wong (2015):

H3: A significant and positive relationship exists between local equity market indices, local property sector indices, and M-REIT returns.

H4: A significant relationship exists between global equity market indices and M-REIT returns.

H5: A significant relationship exists between the regional REIT market and M-REIT returns.

Methodology

Data

The research design outlines the methodological framework established to achieve the objectives of this study. The primary aim is to address the defined research questions, with the objectives representing the specific accomplishments targeted. Data for this study were collected from DataStream and individual REIT company annual reports from 2005 to 2018. The sample consists of all 18 REITs listed on Bursa Malaysia during this period: AHP, ALAQAR, ALSREIT, AMFIRST, ARREIT, ATRIUM, AXREIT, CMMT, HEKTAR, IGBREIT, KLCC, KIP, MQREIT, PAVREIT, SUNREIT, TWRREIT, UOAREIT, and YTLREIT. ALSREIT, AXREIT, KLCC, and ALAQAR are classified as Islamic REITs. The dataset is further classified into two panels - conventional and Islamic REITs - and is also segmented into sub-periods relative to the Global Financial Crisis (GFC) for comparative analysis.

Research Design

The primary objective of this study is to investigate the performance of M-REITs. A quantitative methodology was selected to achieve this objective, specifically to analyse M-REIT price movements by calculating dividend yields and capital returns. This approach facilitates further analysis of the correlations with interest rates and stock markets, and the computation of total returns and dividend yields from 2005 to 2018. Furthermore, established quantitative research designs were replicated and extended for deeper investigation.

The study employs a two-panel research structure to account for the composition of the M-REIT market, which consists of both conventional and Islamic REITs. The first panel segregates the data for a comparative performance analysis between the 14 conventional REITs and the 4 Islamic REITs listed on Bursa Malaysia. The second panel examines

performance across phases of the Global Financial Crisis (GFC), dividing the sample into three distinct periods: pre-GFC (April 2005 to December 2007), during the GFC (January 2008 to December 2009), and post-GFC (January 2010 to December 2018).

M-REIT performance in these periods is assessed using dividend yield and calculated total returns. Following the methodology of Ting (1999), which employed a risk-return analysis framework, returns are computed based on the formula:

$$Total\ REIT\ Return = \frac{(P_1 - P_0) + D}{P_0}$$

P_0 = Initial REIT Price

P_1 = Ending REIT Price

D = Dividends

In addition, Ting's (1999) research further analyzes the dynamic relationship between listed property trusts with the domestic stock market and property indices, which are somewhat relevant to our correlation analysis in the latter part of the elaboration of research methodology.

The computation of the dividend performance of M-REITs follows this research. By replicating the method used by Olanrele, Said, & Daud (2015), the dividend returns are computed as follows:

$$Distribution\ Yield\ = \frac{Income\ distribution\ paid\ a\ REIT\ unit\ holder}{REIT's\ price\ paid\ by\ the\ unit\ holder}$$

The dynamic relationships between M-REITs, interest rates, regional REIT markets, and stock markets were analyzed over time. Short-term interest rates were proxied by the 3-month, 6-month, and 1-year Kuala Lumpur Interbank Offered Rates (KLIBOR). Medium-term rates were represented by 2-year and 5-year Interest Rate Swaps (IRS), 5-year Malaysia Government Securities (MGS), and 5-year AAA and BBB-rated Private Debt Securities (PDS). Long-term rates were proxied by 10-year MGS, IRS, and PDS. The global and local equity markets were represented by the S&P 500 and FBMKLCI indices, respectively.

This study replicates the methodology of Wong (2015), which builds on earlier work by Ling, Webb, and Myer (2003). Correlation analysis was first conducted to identify highly correlated variables from these interest rates, equity market, and regional REIT market proxies. These selected proxies were then used to analyze their relationship with the M-REIT index across different subsets (all M-REITs, conventional, and Islamic) and sub-periods (pre-GFC, during GFC, post-GFC).

Table 1. Listed Malaysia Real Estate Investment Trusts as of 31st December 2018.

REIT Name	Stock Abbreviations	Stock Code	REIT Type	IPO Date	Market Cap. (Debut) RM ('million)	Market Cap. (till 31-12-2018) RM ('million)	Portfolio
AL - 'AQAR HEALTHCARE	ALAQAR	5116	Islamic	10-Aug-2006	323	965	Hospital, Nursing College, Hotel
AL - SALAM	ALSREIT	5269	Islamic	29-Sep-2015	540	467	Commercial Retail, Office, Industrial Purposes
AMANAH HARTANAH PNB	AHP	4952	Conventional	28-Dec-1995	N/A	172	Retail, Office
AMANAH RAYA	ARREIT	5127	Conventional	26-Feb-2007	165	470	Industrial, Office, Hotel, Institutions, Retail
AMFIRST	AMFIRST	5120	Conventional	21-Dec-2006	429	412	Office, Retail, Hotel
ATRIUM	ATRIUM	5130	Conventional	4-Feb-2007	122	136	Industrial, Warehouse, Office
AXIS	AXREIT	5106	Islamic	3-Aug-2005	257	1,930	Office, Industrial
CAPITAMALLS MALAYSIA	CMMT	5180	Conventional	16-Jul-2010	1,400	2,065	Retail
HEKTAR	HEKTAR	5121	Conventional	4-Dec-2006	336	600	Retail
IGB	IGBREIT	5227	Conventional	21-Sep-2012	4,250	6,115	Retail
KLCC	KLCC	5235SS	Islamic	9-May-2013	13,086	13,829	Retail, Office
KIP	KIP	5280	Conventional	6-Feb-2017	465	404	Retail
MRCB QUILL	MQREIT	5123	Conventional	8-Jan-2007	195	1,136	Commercial, Carparks, Office, Industrial
PAVILION	PAVREIT	5212	Conventional	7-Dec-2011	2,700	4,980	Retail, Office
SUNWAY	SUNREIT	5176	Conventional	8-Jul-2010	2,412	5,213	Retail, Hotel, Office
TOWER	TWREIT	5111	Conventional	12-Apr-2006	254	258	Office
UOA	UOAREIT	5110	Conventional	30-Dec-2005	262	554	Office
YTL HOSPITALITY	YTLREIT	5109	Conventional	16-Dec-2005	998	1,994	Commercial, Convertible Preference Units of REITs

Subsequently, regression analysis was employed to test the impact of the selected independent variables, interest rate changes, equity market returns, and regional REIT market returns on M-REIT returns using the following multifactor model:

$$\Delta\, MREIT_t = \alpha + \beta_1\, \Delta FBMKLCI + \beta_2\, \Delta FBMKLPRP_t + \beta_3\, \Delta STIR + \beta_4\, \Delta MTIR + \beta_5\, \Delta LTIR + \beta_6\, \Delta SREIT_t + \beta_7\, \Delta HKREIT_t + \beta_8\, \Delta JREIT_t + \beta_9\, \Delta AREIT_t + e$$

M-REIT	=	Daily returns for the M-REIT Indices.
FBMKLCI	=	Daily returns for the FTSE-Bursa Malaysia Composite Indices.
FBMKLPRP	=	Daily returns for the FTSE-Bursa Malaysia Property Indices.
STIR	=	Daily change in yield in the short-term interest rate proxies.
MTIR	=	Daily change in yield in the medium-term interest rate proxies.
LTIR	=	Daily change in yield in the long-term interest rate proxies.
SREIT	=	Singapore REIT Indices.
HKREIT	=	Hong Kong REIT Indices.
JREIT	=	Japan REIT Indices.
AREIT	=	Australia REIT Indices.

Independent variables are regressed against the M-REITs and individual beta, as described by Myers et al. (2013). Significance levels are determined using regression analysis. According to Myers et al. (2013), the outcome of a single dependent variable can be predicted using multiple regression, an extension of simple linear regression that involves two or more independent variables. Multiple regression functions are employed to assess the overall fit of the model and to evaluate the relative contribution of each predictor to the total variance explained. Finally, robustness checks are conducted using SPSS. It is essential to observe how conclusions may change under different assumptions. The robustness check indicates that the independent variables are well-fitted using a multiple regression model, particularly since this research involves discrete data with numerous categories.

Results

Historical data from Bloomberg, Datastream, and REIT annual reports were systematically analyzed. Distribution yield is calculated as distributable income per unit (DPU) divided by the share price, using year-end closing prices from 2005 to 2018. Total returns encompassing price changes and all dividends were computed for each REIT to provide a more comprehensive performance measure.

Tables 2 and 3 show that nearly 30% of the 18 M-REITs were diversified across property types. Focused REITs generally exhibited better distribution yields than diversified ones, with retail-based REITs outperforming non-retail. Premier retail M-REITs like Pavilion

REIT and IGB REIT provided average yields of 4.34% and 4.96% respectively, while smaller retail REITs like Hektar REIT and KIP REIT averaged above 7.18%. MRCB-Quill REIT was a top performer with yields above 8.09%. During the Global Financial Crisis (GFC), most M-REITs offered higher yields as they maintained dividends despite lower share prices, trading at a discount to NAV. On average, conventional REITs yielded 6.66%, higher than Islamic REITs at 5.10%.

Tables 4 and 5 present the total returns since IPO. Axis REIT recorded the highest first-day return at 34.4%, followed by MRCB Quill REIT (16.25%) and Pavilion REIT (13.33%), while AmFirst REIT had the lowest (-10.96%). KIP REIT showed the highest average monthly return (1.74%), though its recent listing in 2017 necessitates a more extended observation period. Other strong performers included AmFirst REIT (1.01%) and MRCB Quill REIT (1.04%), with annualized returns above 10.0%. Among Islamic REITs, Al-'Aqar Healthcare REIT (5.65%) and Axis REIT (6.52%) outperformed.

Total returns were calculated as capital gains since IPO plus accumulated distributions. Most M-REITs delivered substantial returns, with Axis REIT achieving the highest at 171.13%. In contrast, younger REITs like KIP REIT (-13.80%) and I-Salam REIT (-4.30%) posted negative returns, suggesting a need for long-term operational efficiency. This indicates REITs are suitable for long-term investors. A comparison between panels showed conventional REITs outperformed Islamic REITs, with average total returns of 96.66% versus 83.23%.

Descriptive Statistics

Before conducting correlation and regression analyses, this study used SPSS to review the descriptive statistics of key variables. The equity indices included the Malaysia REIT Index, FBM Kuala Lumpur Composite Index (comprising the 30 largest companies on Bursa Malaysia), FBM Kuala Lumpur Property Index, and S&P 500 Composite Index. Regional REIT indices from Singapore, Japan, Australia, and Hong Kong were also included, with the U.S. REIT index representing the global market. For long-term interest rates (under 10 years), the study analyzed Malaysia Government Securities (MGS), Private Debt Securities (PDS) with AAA and BBB ratings, and Interest Rate Swaps (IRS). The same instruments are applied for medium-term rates (under 5 years) with shorter maturities. For short-term rates (under 1 year), the Kuala Lumpur Interbank Offered Rate (KLIBOR) was measured at 1-year, 6-month, and 3-month intervals. A total of 3,571 daily return data points were collected. The term structure of interest rates was created by calculating the differences between the MGS's 10-year interest rate and KLIBOR's 3-month interest rate. Credit spreads were calculated by comparing the yields between MGS's and PDS's 10-year bonds. In summary, equity market indices had mean returns that were generally higher than those of government and corporate bonds, with the Malaysian equity market exhibiting less volatility compared to other regional markets. Tables 6 and 7 present the descriptive statistics.

Table 2: M-REITs distribution yield

DISTRIBUTION YIELD (%)															
CONVENTIONAL REIT															
	YEAR														
REIT NAME	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**Average**
AMANAH HARTA PNB	7.04	6.9	6.71	6.82	8.5	7.22	6.86	6.98	6.79	6.43	6.32	6.8	4.74	7.12	6.80
AMANAH RAYA	NA	NA	NA	5.79	10.09	6.15	7.75	7.76	7.92	7.72	7.07	7.08	6.46	6.52	7.30
AMFIRST	NA	NA	NA	6.28	8.93	8.33	8.01	7.76	6.93	7.49	7.22	6.67	5.04	6.94	7.24
ATRIUM	NA	NA	NA	9.34	13.44	7.32	8.08	7.33	6.77	6.72	6.53	7.71	5.36	6.99	7.78
CAPITALAND MALAYSIA	NA	NA	NA	NA	NA	NA	NA	5.58	4.31	5.94	5.94	5.99	5.77	7.15	5.81
HEKTAR	NA	NA	2.03	7.65	11.33	7.92	7.69	7.5	6.76	6.95	6.91	6.95	6.56	7.87	7.18
IGB	NA	NA	NA	NA	NA	NA	NA	NA	1.32	5.95	5.7	5.46	5.18	6.17	4.96
KIP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.55	8.55
MRCB QUILL	NA	NA	NA	0.27	5.34	8.73	7.25	7.61	7.35	7.29	7.35	6.79	7.30	8.21	6.75
PAVILION	NA	NA	NA	NA	NA	NA	NA	0.38	4.2	5.33	5.1	4.9	4.74	5.72	4.34
SUNWAY	NA	NA	NA	NA	NA	NA	3.02	5.74	5.19	5.72	5.11	5.54	5.32	5.98	5.20
TOWER	NA	NA	5.4	6.73	10.05	8.26	8.4	7.75	7.68	7.33	5.45	5.77	5.77	6.03	7.05
UOA	NA	NA	7.39	6.55	9.64	8.1	7.33	7.18	7.43	7.57	6.83	6.84	5.85	6.11	7.24
YTL HOSPITALITY	NA	NA	4.42	6.35	9.02	7.75	7.42	7.59	6.56	8.31	8.03	7.22	4.97	6.84	7.04
TOTAL AVERAGE	**7.04**	**6.90**	**5.19**	**6.17**	**9.01**	**6.79**	**6.46**	**5.97**	**5.53**	**6.27**	**5.87**	**5.92**	**5.07**	**6.29**	**6.66**

Table 3: M-REITs distribution yield, continued.

DISTRIBUTION YIELD (%)															
ISLAMIC REIT															
	YEAR														
REIT NAME	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Average
AL - 'AQAR HEALTHCARE	NA	NA	2.86	7.62	6.05	6.48	6.78	6.3	5.78	5.65	5.46	5.07	3.37	6.42	5.65
AL - SALAM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.23	5.71	7.14	4.69
AXIS	NA	2.78	9.49	8.17	12.28	7.72	6.74	6.41	5.04	5.61	5.1	5.12	5.08	5.28	6.52
KLCC	NA	NA	NA	NA	NA	NA	NA	NA	2.28	4.51	4.69	0.85	3.74	5.01	3.51
TOTAL AVERAGE	NA	**2.78**	**6.18**	**7.90**	**9.17**	**7.10**	**6.76**	**6.36**	**4.37**	**5.26**	**5.08**	**3.07**	**4.48**	**5.96**	**5.10**

Note: Table 3 shows the dividend performance of individual REITs listed in Bursa Malaysia during the observation period from 2005 to 2018.

Table 4: M-REITs total returns

CAPITAL RETURNS									
	CONVENTIONAL REIT								
REIT NAME	IPO DATE	IPO PRICE (RM)	FIRST DAY CLOSING PRICE (RM)	FIRST DAY RETURN	CLOSING PRICE 31-DEC-2018	SINCE IPO	AVERAGE MONTHLY	ANNUALISED	TOTAL RETURNS SINCE IPO
AMANAH	28-Dec-1995	-	-	-	0.7800	N/A	0.57%	7.74%	N/A
AMANAH RAYA	26-Feb-2007	0.8950	0.9800	9.50%	0.8200	-8.38%	0.76%	8.65%	78.57%
AMFIRST	21-Dec-2006	0.9030	0.8040	-10.96%	0.5250	-41.86%	1.01%	12.79%	48.64%
ATRIUM	4-Feb-2007	1.0000	0.9350	-6.50%	1.1100	11.00%	0.59%	6.73%	105.06%
CAPITALAND	16-Jul-2010	1.0000	0.9800	-2.00%	1.0100	1.00%	0.64%	5.26%	67.74%
HEKTAR	4-Dec-2006	1.0170	1.0070	-0.98%	1.1100	9.14%	0.67%	8.32%	125.87%
IGB	21-Sep-2012	1.2500	1.3900	11.20%	1.7300	38.40%	0.21%	1.28%	78.20%
KIP	6-Feb-2017	1.0000	1.0400	4.00%	0.7500	-25.00%	1.74%	3.51%	-13.80%
MRCB QUILL	8-Jan-2007	0.8430	0.9800	16.25%	1.0600	25.74%	1.04%	12.02%	136.10%
PAVILION	7-Dec-2011	0.9000	1.0200	13.33%	1.6400	82.22%	0.43%	3.03%	139.64%
SUNWAY	8-Jul-2010	0.9000	0.8850	-1.67%	1.7300	92.22%	0.51%	4.19%	161.11%
TOWER	12-Apr-2006	1.0700	1.0500	-1.87%	0.9200	-14.02%	0.74%	10.05%	86.20%
UOA	30-Dec-2005	1.1500	1.1800	2.61%	1.3100	13.91%	0.61%	8.16%	122.25%
YTL	16-Dec-2005	0.9600	1.0300	7.29%	1.1800	22.92%	0.61%	8.20%	120.99%
AVERAGE RETURN									**96.66%**

Table 5: M-REITs total returns, continued.

CAPITAL RETURNS									
	ISLAMIC REIT								
REIT NAME	IPO DATE	IPO PRICE (RM)	FIRST DAY CLOSING	FIRST DAY RETURN	CLOSING PRICE 31-DEC-	SINCE IPO	AVERAGE MONTHLY	ANNUALISED	TOTAL RETURNS
AL - 'AQAR HEALTHCARE	10-Aug-2006	0.9500	0.9850	3.68%	1.3100	37.89%	0.40%	4.92%	134.16%
AL - SALAM	29-Sep-2015	1.0000	1.0500	5.00%	0.8050	-19.50%	0.96%	9.55%	-4.30%
AXIS	3-Aug-2005	1.2500	1.6800	34.40%	1.5600	24.80%	0.72%	9.73%	171.13%
KLCC	9-May-2013	7.2500	7.6800	5.93%	7.6600	5.66%	0.23%	1.15%	31.95%
AVERAGE RETURN									83.23%

Note: *AHP was re-classified from property trust to REIT in August 2005, and KLCCP REIT was converted into an Islamic REIT in May 2013. There are 18 listed Malaysian REITs (M-REITs) as of 31st December 2018, and they are shown in Column 1. The table depicts the conventional and Islamic M-REITs. Column 2 shows the listing date of the respective M-REITs with their listing price in column 3. The next two columns show the closing price of the M-REITs on their first trading day and their respective returns. Meanwhile, Column 6 presents the closing price of the M-REITs as of 31 December 2018, followed by average monthly return, annualized return, and total capital returns in the next three columns. The total capital returns are calculated based on the differences in prices as of 31 December 2018, inclusive of dividends since IPO.

Table 6: Descriptive Statistics of Key Variables

Descriptive Analysis	Daily Return M-REIT Index	FBMKLCI Index	FBMKLPRP Index	S&P 500 Composite Index	S-REIT Index	HK-REIT Index	J-REIT Index	A-REIT Index	US-REIT Index
Mean	0.0103%	0.0209%	0.0118%	0.0278%	0.0208%	0.0424%	0.0145%	0.0061%	0.0410%
Median	0.0000%	0.0100%	0.0000%	0.0300%	0.0200%	0.0000%	0.0000%	0.0200%	0.0000%
Minimum	-8.48%	-9.50%	-9.22%	-9.03%	-16.26%	-12.41%	-11.14%	-16.87%	-19.01%
Maximum	10.49%	4.35%	6.41%	11.58%	22.66%	10.60%	11.18%	11.07%	47.46%
Std. Deviation	0.0097	0.0070	0.0095	0.0117	0.0131	0.0117	0.0143	0.0167	0.0221
Skewness	0.28	-0.97	-0.49	-0.12	1.01	-0.19	0.02	-0.82	3.19
Kurtosis	12.01	13.88	9.95	12.38	37.82	10.58	7.86	10.80	73.25

a. Multiple modes exist. The smallest value is shown

Table 7: Descriptive Statistics of Key Variables, continued.

Daily Changes															
Descriptive Analysis	**PDS AAA 10Y Bond Yield**	**PDS AAA 5Y Bond Yield**	**PDS BBB 10Y Bond Yield**	**PDS BBB 5Y Bond Yield**	**MGS 10Y Bond Yield**	**MGS 5Y Bond Yield**	**IRS 10Y Interest Yield**	**IRS 7Y Interest Yield**	**IRS5Y Interest Yield**	**IRS2Y Interest Yield**	**KLIBOR 6M**	**KLIBOR 3M**	**KLIBOR 1M**	**Term Structure**	**Credit Spread**
Mean	-0.0038%	0.0007%	0.0032%	0.0003%	0.0018%	0.0044%	-0.0022%	-0.0009%	-0.0008%	0.0049%	0.0095%	0.0090%	0.0098%	-0.9856%	0.0114%
Median	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%	0.0000%
Minimum	0.00%	0.00%	-10.26%	-7.91%	-13.89%	-15.88%	-8.86%	-8.45%	-7.20%	-16.15%	-19.31%	-19.69%	-18.60%	-4.00%	1.50%
Maximum	0.46%	0.34%	11.76%	9.35%	29.73%	22.32%	6.62%	6.89%	6.92%	9.15%	9.03%	8.47%	9.94%	4.00%	18.57%
Std. Deviation	2.8529	1.8262	0.0095	0.0076	0.0111	0.0095	0.0109	0.0106	0.0092	0.0085	0.0054	0.0055	0.0054	0.0070	0.0150
Skewness	0.04	0.04	1.07	0.60	9.08	4.60	-0.52	-0.24	0.05	-2.62	-20.29	-20.51	-18.72	-53.25	1.21
Kurtosis	380.03	63.10	49.90	46.48	261.03	169.77	9.51	7.70	10.56	62.95	806.82	803.30	762.93	3069.94	44.82

Empirical Results

The tables below present the results of a multifactor regression analysis investigating M-REIT sensitivities to interest rates, equity markets, and regional REIT markets. The analysis, consistent with prior sections, uses Panel A (all M-REITs), Panel B (conventional), and Panel C (Islamic). Significant variables from correlation analysis were selected: IRS 10-year (long-term), PDS BBB 5-year (medium-term), and KLIBOR 3-month (short-term) as interest rate proxies. Local equity markets were represented by the FBM KLCI and FBM KL Property Index; the S&P 500 and US REIT index were excluded due to insignificance. Regional REIT indices from Singapore, Japan, Australia, and Hong Kong were included.

Tables 8,9,10 show the regression results. Model 1 is the full model. Models 2, 3, and 4 isolate the effects of domestic equity, interest rates, and regional REIT markets, respectively. The analysis uses 3,587 daily data points from April 2005 to December 2018. For Panel A (all M-REITs), Model 1's R^2 of 0.179 indicates the variables explain approximately 18% of the variability in M-REIT returns, comparable to findings in US markets (Allen, Madura, & Springer, 2000). The FBM KLCI and FBM Property indices were statistically significant ($p<.0005$). The IRS 10-year rate was also significant ($p<.0005$) but inversely related to returns. Among regional markets, Singapore (S-REIT) and Australia (A-REIT) REITs showed positive significance ($p<.0005$). The Durbin-Watson statistics of 2.202 suggest no autocorrelation. The coefficient of 0.212 for FBM KLCI implies a 0.212% increase in M-REIT returns for every 1% market rise, aligning with Allen et al. (2000). Conversely, a 1% increase in the IRS 10-year rate decreased returns by 0.054%.

Single-factor analysis revealed the local equity market explained about 16% of returns overall, but this varied by period: 26% pre-GFC, decreasing to 10.7% during, and 16.4% post-GFC. The influence of regional REIT markets increased from 9.1% to 11.8% from the GFC to the post-GFC periods. Interest rates had a minimal effect ($R^2 < 1\%$), with the IRS 10-year rate being the dominant proxy, leading to only partial support for the interest rate hypothesis. S-REITs had the strongest regional influence, with a 1% increase associated with a 0.074% rise in M-REIT returns.

Panel B (conventional REITs) yielded similar results to Panel A. Local equity and S-REIT returns were significant ($p<.0005$), explaining 10.5% and 6% of returns, respectively. Regional REIT markets explained 7.7% of returns during the GFC and 7.3% post-GFC. Interest rates were statistically insignificant for conventional REITs. Panel C (Islamic REITs) behaved differently. The full model explained only 1.1% of return variability over the entire period, with no significant proxies. Variability was higher pre-GFC ($R^2=24.7\%$), with local equity markets being significant ($p<.0005$), but this dropped to below 1.5% during and after the GFC. Islamic REITs also showed a unique sensitivity, being more responsive to the FBM KLCI than the property index, a pattern that reversed post-GFC (See Table 11-16).

In summary, M-REITs are primarily sensitive to domestic equity markets and regional REITs, particularly S-REITs, with a weak, inverse relationship to long-term interest rates. The diminished influence of these factors on Islamic REITs supports the argument by Morad and Masih (2015) and Muhammad N. (2016) that their Shariah-compliant nature offers distinct portfolio diversification characteristics, especially during crises, as the selected factors explained only 7.6% of their total variability.

Table 8: Results of Regression Analysis and Correlation Analysis between M-REITs and selected Independent Variables

Panel A: M-REIT (All)	Whole Period (Apr 2005 - Dec 2018)								Pre GFC (Apr 2005 - Dec 2007)							
	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.000	0.988	0.0000	0.961	0.0001	0.496	0.000	0.779	0.000	0.469	0.000	0.504	0.0002	0.588	0.000	0.996
FBMKLCI	0.212	0.000	0.262	0.000					0.223	0.000	0.282	0.000				
FBMPRP	0.146	0.000	0.166	0.000					0.229	0.000	0.256	0.000				
KLIBOR3M	-0.035	0.021			-0.047	0.004			0.023	0.483			-0.002	0.951		
PDSBBB5Y	0.040	0.008			0.045	0.008			0.005	0.879			0.064	0.088		
IRS10Y	-0.054	0.000			-0.042	0.012			-0.068	0.037			-0.095	0.011		
SREIT	0.074	0.000					0.179	0.000	0.036	0.373					0.154	0.000
HKREIT	0.037	0.025					0.080	0.000	0.080	0.019					0.101	0.001
JREIT	0.003	0.865					0.012	0.473	0.047	0.185					0.050	0.081
AREIT	0.059	0.001					0.114	0.000	0.049	0.206					0.123	0.000
R	0.423[a]		0.398[a]		0.078[a]		0.300[a]		0.527a		0.507[a]		0.112[a]		0.391[a]	
R^2	0.179		0.159		0.006		0.090		0.278		0.257		0.013		0.153	
Durbin-Watson	2.202		2.189		2.131		2.178		2.186		2.188		2.129		2.162	

Table 9: Results of Regression Analysis and Correlation Analysis between M-REITs and selected Independent Variables, continued

Panel A: M-REIT (All)	GFC (Jan 2008 - Dec 2009)								Post GFC (Jan 2010 - Dec 2018)							
	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.000	0.717	0.000	0.817	-0.0003	0.540	0.000	0.835	0.000	0.915	0.000	0.819	0.0001	0.484	0.000	0.904
FBMKLCI	0.217	0.002	0.243	0.000					0.241	0.000	0.298	0.000				
FBMPRP	0.047	0.486	0.045	0.380					0.103	0.000	0.142	0.000				
KLIBOR3M	-0.113	0.006			-0.136	0.002			-0.024	0.195			-0.017	0.412		
PDSBBB5Y	0.019	0.650			0.011	0.793			0.045	0.014			0.049	0.017		
IRS10Y	-0.038	0.354			-0.003	0.946			-0.048	0.009			-0.041	0.046		
SREIT	0.097	0.058					0.170	0.001	0.152	0.000					0.254	0.000
HKREIT	-0.037	0.442					0.005	0.913	0.037	0.066					0.075	0.000
JREIT	-0.056	0.220					-0.051	0.270	0.024	0.205					0.029	0.152
AREIT	0.130	0.010					0.192	0.000	0.041	0.065					0.072	0.002
R	0.387[a]		0.328[a]		0.137[a]		0.301[a]		0.450[a]		0.405[a]		0.067[a]		0.343[a]	
R^2	0.150		0.107		0.019		0.091		0.203		0.164		0.004		0.118	
Durbin-Watson	2.302		2.302		2.197		2.299		2.208		2.169		2.117		2.177	

Table 10: Results of Regression Analysis and Correlation Analysis between M-REITs and selected Independent Variables, continued

Correlations[c]										
		FBMKLCI	FBMPRP	KLIBOR3M	PDSBBB5Y	IRS10Y	SREIT	HKREIT	JREIT	AREIT
MREIT	Pearson Correlation	**.381****	**.354****	**-.049****	**.044****	**-.043****	**.268****	**.181****	**.112****	**.232****
	Sig. (2-tailed)	.000	.000	.003	.008	.009	.000	.000	.000	.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=3587

Note: Three panels are presented horizontally with Panel A showing the results for the composite M-REIT index; Panel B, the conventional M-REIT index; while Panel C, the Islamic M-REIT index. *, ** and *** represent significant levels of 10%, 5% and 1% respectively. Tables 7 (A, B & C) shows the results of the regression analysis on the identification of factors that drive M-REIT returns in Panel A. There are four columns, which present the results for the whole and three subsample periods, under each panel. Within each sample period, there are four additional columns that show the results for each individual model. Model 1 is the full model as shown in Equation 1 while the other three models are factor-specific models which are variations of Model 1. Tables followed by the correlations for selected independent variables regressed over M-REITs.

Table 11: Results of Regression Analysis and Correlation Analysis between Conventional M-REITs and selected Independent Variables

Panel B: M-REIT (Conventional)	Whole Period (Apr 2005 - Dec 2018)								Pre GFC (Apr 2005 - Dec 2007)							
	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.000	0.624	-0.0001	0.641	0.0000	0.924	0.000	0.809	0.000	0.370	-0.0003	0.402	0.0001	0.704	0.000	0.809
FBMKLCI	0.193	0.000	0.235	0.000					0.218	0.000	0.276	0.000				
FBMPRP	0.096	0.000	0.112	0.000					0.232	0.000	0.259	0.000				
KLIBOR3M	-0.027	0.091			-0.036	0.029			0.023	0.474			-0.002	0.963		
PDSBBB5Y	0.033	0.038			0.036	0.031			0.005	0.875			0.064	0.088		
IRS10Y	-0.040	0.011			-0.030	0.070			-0.069	0.033			-0.096	0.010		
SREIT	0.064	0.001					0.148	0.000	0.039	0.344					0.148	0.000
HKREIT	0.020	0.238					0.055	0.002	0.081	0.018					0.055	0.002
JREIT	0.028	0.098					0.036	0.037	0.041	0.246					0.036	0.037
AREIT	0.039	0.037					0.085	0.000	0.048	0.220					0.085	0.000
R	0.344[a]		0.324[a]		0.060[a]		0.246[a]		0.524[a]		0.505[a]		0.113[a]		.388[a]	
R^2	0.118		0.105		0.004		0.060		0.275		0.255		0.013		0.151	
Durbin-Watson	2.159		2.149		2.118		2.147		2.159		2.163		2.114		2.138	

Table 12: Results of Regression Analysis and Correlation Analysis between Conventional M-REITs and selected Independent Variables, continued

	GFC (Jan 2008 - Dec 2009)								Post GFC (Jan 2010 - Dec 2018)							
Panel B: M-REIT (Conventional)	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.000	0.421	-0.0003	0.500	-0.0005	0.313	0.000	0.515	0.000	0.773	0.0000	0.873	0.0001	0.828	0.000	0.820
FBMKLCI	0.207	0.004	0.264	0.000					0.211	0.000	0.255	0.000				
FBMPRP	0.039	0.566	0.050	0.460					0.044	0.088	0.076	0.004				
KLIBOR3M	-0.105	0.012			-0.127	0.004			-0.013	0.510			-0.007	0.725		
PDSBBB5Y	0.018	0.662			0.011	0.800			0.035	0.072			0.037	0.075		
IRS10Y	-0.037	0.378			-0.004	0.923			-0.028	0.152			-0.023	0.267		
SREIT	0.086	0.099					0.153	0.003	0.125	0.000					0.202	0.000
HKREIT	-0.029	0.547					0.010	0.833	0.013	0.543					0.041	0.055
JREIT	-0.054	0.239					-0.050	0.289	0.065	0.001					0.068	0.001
AREIT	0.120	0.019					0.178	0.000	0.017	0.456					0.041	0.086
R	0.359[a]		.305[a]		.128[a]		.278[a]		0.349[a]		.309[a]		.044[a]		.270[a]	
R^2	0.129		0.093		0.016		0.077		0.122		0.096		0.002		0.073	
Durbin-Watson	2.240		2.245		2.166		2.246		2.153		2.119		2.096		2.141	

Table 13: Results of Regression Analysis and Correlation Analysis between Conventional M-REITs and selected Independent Variables, continued

Correlations[c]									
		FBMKLCI	FBMPRP	KLIBOR3M	PDSBBB5Y	IRS10Y	SREIT	HKREIT	JREIT	AREIT
MREITCON	Pearson Correlation	**.315****	**.280****	**-.037***	**.036***	-.031	**.221****	**.142****	**.113****	**.186****
	Sig. (2-tailed)	.000	.000	.025	.032	.061	.000	.000	.000	.000

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=3587

Note: Three panels are presented horizontally with Panel A showing the results for the composite M-REIT index; Panel B, the conventional M-REIT index; while Panel C, the Islamic M-REIT index. *, ** and *** represent significant levels of 10%, 5% and 1% respectively. Tables 8 (A, B & C) shows the results of the regression analysis on the identification of factors that drive conventional M-REIT returns in Panel B. There are four columns, which present the results for the whole and three subsample periods, under each panel. Within each sample period, there are four additional columns that show the results for each individual model. Model 1 is the full model as shown in Equation 1, while the other three models are factor-specific models, which are variations of Model 1. Tables followed by the correlations for selected independent variables regressed over conventional M-REITs.

Table 14: Results of Regression Analysis and Correlation Analysis between Islamic M-REITs and selected Independent Variables

Panel C: M-REIT (Islamic)	Whole Period (Apr 2005 - Dec 2018)								Pre GFC (Apr 2005 - Dec 2007)							
	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.001	0.392	0.0007	0.379	0.0008	0.339	0.001	0.389	0.000	0.874	0.0000	0.906	0.0004	0.333	0.000	0.630
FBMKLCI	-0.004	0.882	0.006	0.804					0.220	0.000	0.276	0.000				
FBMPRP	0.076	0.002	0.082	0.001					0.204	0.000	0.230	0.000				
KLIBOR3M	-0.008	0.633			-0.010	0.534			0.020	0.551			-0.004	0.920		
PDSBBB5Y	0.007	0.666			0.009	0.590			0.004	0.900			0.059	0.112		
IRS10Y	-0.022	0.180			-0.020	0.230			-0.059	0.073			-0.085	0.023		
SREIT	0.016	0.443					0.037	0.067	0.027	0.510					0.175	0.000
HKREIT	0.027	0.136					0.035	0.055	0.073	0.038					0.111	0.003
JREIT	-0.047	0.008					-0.046	0.009	0.060	0.102					0.079	0.043
AREIT	0.023	0.250					0.032	0.110	0.049	0.213					0.148	0.000
R	0.105[a]		0.086[a]		.025[a]		0'.077[a]		.497[a]		.478[a]		.102[a]		.371[a]	
R^2	0.011		0.007		0.001		0.006		0.247		0.228		0.010		0.138	
Durbin-Watson	2.012		2.006		2.005		2.012		2.221		2.219		2.150		2.198	

Table 15: Results of Regression Analysis and Correlation Analysis between Islamic M-REITs and selected Independent Variables, continued

Panel C: M-REIT (Islamic)	GFC (Jan 2008 - Dec 2009)								Post GFC (Jan 2010 - Dec 2018)							
	Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT		Model 1 Full		Model 2 Market		Model 3 Interest Rate		Model 4 REIT	
	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
(Constant)	0.000	0.509	0.0004	0.738	0.0003	0.661	0.000	0.453	0.001	0.437	0.0009	0.445	0.0010	0.416	0.001	0.464
FBMKLCI	0.146	0.047	0.192	0.776					-0.020	0.479	-.008	0.760				
FBMPRP	0.040	0.566	0.049	0.713					0.077	0.005	.082	0.003				
KLIBOR3M	-0.079	0.067			-0.095	0.030			-0.007	0.741			-0.006	0.767		
PDSBBB5Y	0.012	0.783			0.007	0.868			0.005	0.812			0.008	0.705		
IRS10Y	-0.025	0.555			0.000	1.000			-0.028	0.170			-0.026	0.207		
SREIT	0.075	0.157					0.127	0.014	0.026	0.331					0.041	0.111
HKREIT	-0.033	0.500					-0.004	0.934	0.029	0.202					0.035	0.122
JREIT	-0.036	0.449					-0.033	0.485	-0.071	0.001					-0.069	0.001
AREIT	0.093	0.076					0.137	0.008	0.017	0.497					0.021	0.400
R	.276[a]		.305[a]		.128[a]		.217[a]		.114[a]		.077[a]		.028[a]		.091[a]	
R^2	0.076		0.054		0.016		0.047		0.013		0.006		0.001		0.008	
Durbin-Watson	2.019		2.023		2.166		2.020		2.014		2.000		2.002		2.014	

Table 16: Results of Regression Analysis and Correlation Analysis between Islamic M-REITs and selected Independent Variables, continued

Correlations[c]										
		FBMKLCI	FBMPRP	KLIBOR3M	PDSBBB5Y	IRS10Y	SREIT	HKREIT	JREIT	AREIT
MREITIS	Pearson Correlation	**.064****	**.086****	-.011	.009	-.020	**.053****	**.048****	-.019	**.048****
	Sig. (2-tailed)	.000	.000	.507	.595	.223	.002	.004	.247	.004

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=3587

Robustness Check

In the final section of regression analysis, a robustness check was performed on the regression analysis to ensure the quality assurance of the research and to verify the results. Panel A in Table 17 presents the eigenvalues and percentages of each principal component, and Panel B shows the factor loadings of the identical principal components. Among the nine independent variables, PC 1 to PC 3, which contributed 50% of the explanatory power, carry an eigenvalue that is above one.

From the summary obtained in Panel B, PC1, which has an explanatory power was 28% can deduce that principal component 1 (PC1) was highly correlated with the local equity market and the regional REIT markets. It was followed by PC3 (10.24%), which shows there is a relationship between M-REIT returns and interest rates (long-term and short-term). Among the independent variables, FBM KLCI, FBM KL Property Indices, Singapore REIT market, and Australia REIT market contribute the most explanatory power to M-REIT returns.

In a nutshell, M-REIT's performance was significantly driven by all these factors. Stock market proxies were strongly correlated to M-REIT returns, and the index movement of regional REIT markets was positively and significantly correlated to M-REIT returns as well. Despite the weak and significant correlation, interest rate proxies were somehow correlated to M-REIT returns, but in a weaker form. Finally, Table 18 below has a summary of hypotheses.

Table 17: Principal Component Analysis of the Selected Independent Variables

	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9
Panel A: Eigenvalues and explanatory power of each principal component									
Eigenvalue	2.803	1.096	1.024	0.998	0.983	0.891	0.735	0.700	0.426
% explained	28.03%	10.96%	10.24%	9.98%	9.83%	8.92%	7.35%	7.00%	4.26%
Panel B: Principal components of independent variables									
FBMKLCI	**.793**	**.344**	.028	-.116	-.081	.060	-.161	-.222	.069
FBMPRP	**.742**	**.427**	.032	-.116	-.091	.060	-.196	-.272	.037
SREIT	**.736**	-.203	.052	.051	.060	-.135	-.193	.249	-.539
AREIT	**.668**	**-.325**	.031	.051	.014	-.045	-.259	.448	.417
IRS10Y	.025	-.043	**.755**	.175	-.612	.025	.146	.034	-.009
PDSBBB5Y	.027	.236	-.067	**.954**	.145	-.019	-.072	-.047	.021
KLIBOR3M	-.072	.286	**.638**	-.119	.689	-.040	.051	.110	.027
JREIT	**.431**	**-.539**	.099	.099	.232	.595	.141	-.276	-.008
HKREIT	**.550**	**-.309**	.010	.046	.111	-.592	.365	-.310	.087

Note: Panel A reports the eigenvalue of each principal component as well as its respective explanatory power. Meanwhile, Panel B shows the factor loading of each independent variable on each of the principal components. Three principal components (i.e., PC1, PC2, and PC3) with an eigenvalue that is each above one are selected for the subsequent regression analysis. Based on the bold factor loadings, PC1 implies the general equity market factor, PC2 signifies the interest-rate factor, and PC3 represents the hybrid factor.

Table 18: Summary of the Results

Hypothesis	**Results**
H1 Distribution yields and total returns are significant performance indicators for M-REITs to compare with bonds.	**Supported**
H2 There is a significant and negative relationship between changes in interest rates and M-REIT returns.	**Partially Supported**
H3 There is a significant and positive relationship between local equity market indices, local property sector indices, and M-REIT returns.	**Supported**
H4 There is a significant relationship between global equity market indices and M-REIT returns.	**Not Supported**
H5 Regional REIT markets' returns are significant factors in explaining returns of M-REITs.	**Supported**

Discussions and conclusions

This study provided an empirical investigation into the structure and performance of Malaysian Real Estate Investment Trusts (M-REITs). The market's development has been significantly shaped by regulatory evolution, notably the guidelines implemented by the Securities Commission Malaysia in 2005 and revised in April 2018. These revisions have enhanced the M-REIT framework by introducing tax benefits, increasing transparency, and allowing eligible REITs to acquire vacant land for development. Malaysia holds the distinction of pioneering Islamic REITs compliant with Shariah law, and the proposed launch of the world's first Airport REIT further underscores the market's innovative trajectory and potential for future growth.

The analysis of distribution yields and total returns indicates that M-REITs are suitable for long-term investment, exhibiting less volatility than general equities. When compared to stable yield instruments, M-REITs generally offer higher returns than fixed deposits and Malaysian Government Securities (MGS). While compared to Employee Provident Fund (EPF) dividends and corporate bonds, performance varies by individual REIT, the average dividend yield of M-REITs (6.6% for conventional, 5.9% for Islamic) surpasses that of AAA-rated government bonds and private debt securities (averaging 4.2% and 4.0%, respectively). These findings support Hypothesis 1.

Hypothesis 2 receives only partial support. The relationship between interest rates and M-REIT returns is inconsistent, varying across long-, medium-, and short-term rates and between economic cycles. Both direct and inverse relationships were observed, making the overall effect uncertain. Conversely, the results strongly support Hypothesis 3, confirming a significant positive correlation between M-REIT returns and the local equity market (FBM KLCI). However, Hypothesis 4 is rejected, as M-REITs were insignificantly correlated with the global equity market (S&P 500). Finally, Hypothesis 5 is generally supported, with regional REIT markets, particularly Singapore (S-REIT), showing a significant, though moderately weak, positive correlation with M-REIT returns.

Despite achieving its objectives, this study has limitations that suggest avenues for future research. First, the relatively short history of the M-REIT market compared to mature markets like the US limits long-term validation. Second, the impact of property-type diversification (e.g., offices, retail, hotels, future airport REITs) and asset location on performance warrants deeper investigation. Third, expanding the analysis to include other Asian and Islamic REIT markets (e.g., in Kuwait, Bahrain, and the UAE) could provide a more comprehensive understanding of regional dynamics and diversification opportunities for international investors. A fourth limitation is the omission of key performance indicators such as the management expense ratio, portfolio turnover ratio, and gearing ratio. Future research could incorporate these metrics to better assess the operational efficiency and financial management of M-REITs, though this would require robust methodological justification from existing literature.

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