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A Study on the Performance and Risk Diversification Benefits of Real Estate Investment Trusts in Malaysia

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ABSTRACT

An evaluation of M-REITs utilizing the Sharpe, Treynor and Jensen measures was conducted from 2007 to 2015 to investigate the risk diversification benefits of REITs. The results indicate that all selected M-REITs outperform the FBM Property Index. The beta values are less than one, implying that M-REITs are less risky than the market. Low R-squared values, however, suggest that M-REITs are poorly diversified showing the potential for diversification opportunities. A portfolio consisting few different M-REITs may result in better performance. The findings of this research can provide a clearer understanding of REITs performance to portfolio managers and investors.

Keywords: Diversification, market risk, performance ratings, Real Estate Investment Trusts, unsystematic risk

INTRODUCTION

Prior to 1960 investing in properties refers to the buying of physical properties or public listed property stocks or real estate linked debt securities/bonds issued by real estate project developers (Anuar & Soi, 2011). The successful development of a wide range of investments in the real estate sector, led to a remarkable beginning of Real Estate Investment Trusts (REIT hereafter). Globally, REITs have been on the rise since its early inception in the United States (1960) and subsequent adoptions in Australia (1970s), Europe and Asia (1990s-2000s).

Real Estate Investment Trusts (REITs) are an asset class that invests in real estate through property or mortgages. It is often

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traded on major exchanges similar to a stock, allowing investors (also known as unit holders) to acquire ownership in real estate ventures, own and in some cases, operate commercial properties such as apartment complexes, hospitals, hotels, housing, industrial facilities, infrastructure, nursing homes, office buildings, shopping malls, timberlands and warehouses. Certain REITs strategically design their investment portfolios by focusing on property locations or types (Lee, Ali, & Lee, 2006). REITs provide investors with an extremely liquid stake in real estate, and providing investors with most of its profits as dividends with benefits of diversification and long-term capital appreciation. Since REITs receive special tax consideration, they, on average, pay out at least 90% of the total annual income to their investors (Securities Commission Malaysia, Aug 2008).

Malaysian REITs or M-REITs, previously acknowledged as Listed Property Trusts (LPTs) performed poorly and experienced slow growth due to impediments both from the underlying local structure and regulatory impediments (Newell, Ting, & Champing, 2002). Changes occurred after the Asian Economic Crisis 1997/98 when Asian countries collaboratively made significant developments in new economic and financial policies and legislations (Husni, 2010). After a decade of successive improvements with revisions in REITs guidelines, the former term LPT was renamed Malaysian REIT (M-REIT). Since the first listing of M-REIT, i.e. Axis REIT, on the main board of Bursa Malaysia in August 2005, the market has grown by leaps and bounds in terms of both market capitalization and the number of listed REITs. In 2013, the KLCC REIT became Malaysia's largest REIT with investment properties of RM14.7 billion. This accounted for three times the size of IGB REIT's of RM 4.6 billion. To date, there are 17 REITs listed on Bursa Malaysia (Appendix 1) with combined market capitalization of RM37.545 billion, total asset value of RM 45.728 billion, total net asset value of RM 31.187 billion as at 31st Dec 2015 (Securities Commission Malaysia, 2015).

With increasing domestic and foreign investors showing interest in M-REITs, market capitalization has been gradually increased over the years. However, market sentiments especially among individual investors is still relatively mild even with continuous listings of M-REITs on Bursa Malaysia.

Limited studies have been conducted to evaluate the performance of all M-REITs stock relative to the broader equity market. This deviates from studies carried out on mutual funds in Malaysia as M-REITs are dividend yield based investments, it is still questionable whether the dividend yields are more significant than domestic inflation levels. It is also debatable if the potential of M-REITs for achieving portfolio diversification is significant as for most fund managers' exposure to this asset class is nominal. This is indispensable as in recent years the increasing inflationary pressure has questioned the effectiveness

of M-REITs as a hedging tool for domestic and foreign investors (NAREIT Brief, 2014; Kloosterman, 2009).

The objective of this study is:

1. To evaluate the investment performance of M-REITs using Sharpe, Treynor and Jensen measures and analysing the results against market indices - FBM Property Index, FBMKLCI Index, and FBMEMAS Index;
2. To determine the risk diversification effectiveness of M-REITs as an investment portfolio.

This paper begins with a review of the literature in Section 2. Data and methodology employed is presented in Section 3. Section 4 highlights the findings and final comments in Section 5.

LITERATURE REVIEW

The thirty years since 1980 saw a number of research conducted that projected REITs' importance and effectiveness in portfolio diversification and performance, along with their risk and return profiles. In a study conducted by Smith and Shulman (1976) it was found that REITs provide higher returns than the market index and saving accounts for the 1963-1973 periods. Other studies showed REITs underperformed the market portfolio were Kuhle, Walther and Turtleback, (1986), Goebel and Kim (1989) and Kim, Mattila and Zheng, (2002a). Titman and Warga (1986) and O'Neal and Page (2000) did not find any evidence that REITs under or overperformed the market benchmark.

Studies from Kuhle, Walther and Wurtzebach, (1986), Gyourko and Nelling (1996), Paladino and Mayo (1998) and Georgiev, Gupta and Kunkel, (2003) found little or no diversification benefits of including REITs in an existing investment portfolio. Lee and Stevenson's (2005) findings indicated that diversification benefits could be derived when REITs were added into an existing portfolio that comprises a mixture of several other assets.

Utilizing common measures of performance such as Jensen (1968), Sharpe (1966) and Treynor (1965), Myer and Webb's (1993) revealed that the performance of real estate funds are not significantly affected by the selection of real estate market indices The findings employed Jensen's alpha measures based on multifactor market model and several real estate market indices. Benefield, Anderson and Zumpano, (2009), examined the differences in risk-adjusted performance between diversified and specialized REITs, and found that the performance of REITs depended much on overall market conditions. Results arising from favorable market conditions exhibited better performance on diversified REITs while less favorable market conditions favored specialized REITs. Eichholtz et al. (2000), based on Jensen's alpha, found that diversified REITs underperformed specialized REITs using both single and multifactor market models.

In Malaysia case studies and evidence on the performance of REITs can be found

in Kok and Khoo (1995), Ting (1999) and Newell, Ting and Acheampong, (2002). Hamzah et al. (2010) showed that M-REITs underperformed the market portfolio during pre-crisis (1995-1997) and post-crisis (1998-2005) period, but outperformed during the financial crisis period (1997-1998). Treynor (1965) and Jensen (1968), Ong (2012) and Aik (2012) also indicated that M-REITs underperformed the market during pre- and post-crisis period but outperformed during crisis period. Results from Ong et al. (2011) which is based on the assessment of net asset value (NAV) of thirteen M-REITs, and revealed that M-REITs are on average traded at NAV premium, i.e. overpriced.

To identify the determinants affecting the performance of M-REITs, Tiong and Rohaya (2015) found that the underperformance of M-REITs is strongly correlated with property types and asset allocation ratios. Anuar and Soi (2011), however, found that total revenue of the underlying real estate assets is the key factor.

The results of Low and Anwar (2014), using Sharpe (1966), Treynor (1965), Jensen (1968), and M-squared (1997) measures indicated that beta values of 12 M-REITs are all less than one and their total risk mostly arising from an unsystematic risk component. The low R-squared values for M-REITs suggested low reliability of beta coefficients, i.e. an indication that M-REITs were very poorly diversified.

METHODS

A sample consisting of 16 M-REITs was used in this study. The number of observations are reflected in Appendix 1 (certain REITs have shorter study period due to different listing dates). Weekly returns were collected from the Bloomberg database. The 3-month Malaysian Treasury Bill is used as the proxy for risk-free rate. The FBM Kuala Lumpur Property Index's weekly returns is utilized as a proxy for market return. Both the 3-month T-bill and market returns were sourced from the Bloomberg database. To make the reported 3-month T-bill rate (an annualized holding period yield) consistent with the weekly returns of M-REITs and market index, it is turned into a weekly equivalent using the formulation of $(1+\text{annualized yield})^{1/52}$.

Total risk or variance of return for each M-REIT is broken down into its systematic and unsystematic risk components. This followed the equation as shown in Levy and Sarnat (1984) and employed by Kim et al. (2002b) and Low and Anwar (2014) in the context of M-REITs.

$$\sigma_i^2 = \beta_i^2 . \sigma_m^2 + \sigma_e^2 \quad (1)$$

where σ_i^2 is the total risk or the variance of return for M-REIT *i*; β_i is beta of M-REIT *i*; σ_m^2 is the variance of return of the market portfolio; $\beta_i^2 . \sigma_m^2$ is the systematic risk of M-REITs *i*; and σ_e^2 is the unsystematic risk of M-REITs *i* which represents the portion of the total risk that can be diversified away. A measure of diversifiability can be calculated by taking the ratio of unsystematic risk to total risk for instant σ_e^2 / σ_i^2 (Levy and Sarnat, 1984; Kim et al., 2002b). The ratio implies whether further diversification is needed

and it is equivalent to the value of one minus the R-squared (1 – R-squared). If the ratio is approaching 0, it indicates that less unsystematic risk remains in the portfolio and the portfolio's risk constitutes mainly of systematic risk which is not diversifiable. However, if the ratio is approaching 1, it signifies that the portfolio has a large proportion of unsystematic risk remaining to be diversified away.

Another risk dimension is the standard deviation. A standard deviation value measures the amount of dispersion or variability from the mean. A high standard deviation relates to a high amount of investment risk. It can be formulated as

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n}(X_i-\mu)^2}{n-1}} \quad (2)$$

Where X_i is % weekly returns; μ is the % mean return for the year; and n is the sample period (years).

To evaluate the performance of M-REITs, Sharpe (1966), Treynor (1965) and Jensen's (1968) alpha are applied.

The Sharpe ratio of M-REIT i is interpreted as the average excess return of an M-REIT divided by its standard deviation of return as indicated below:

$$S_i = \frac{r_i - r_f}{\sigma_i} \quad (3)$$

r_i is the average return; r_f is the average risk free rate; and σ_i is the average standard deviation.

The Treynor ratio is a risk-adjusted performance assessment measure comparable with the Sharpe Ratio. Both Treynor and Sharpe measures how worthwhile an investment tool is by paying the shareholders for a given degree of the risk. They differ as Sharpe uses standard deviation to measure risk while Treynor uses beta. The Treynor measures the average excess return to the systematic risk of M-REIT i as shown below:

$$T_i = \frac{r_i - r_f}{\beta_i} \quad (4)$$

Where r_i is the average return; r_f is the average risk free rate; and β_i the beta coefficient of each M-REIT.

Jensen's alpha measures the rate of the return attributed to the market volatility as measured by the M-REIT's beta in relation to the market beta by using the Capital Asset Pricing Model (CAPM). Each M-REIT's Jensen's alpha follows the regression specification to estimate:

Jensen's alpha = Portfolio Return − [Risk Free Rate + Portfolio Beta x (Market Return − Risk Free Rate)]

$$\alpha_i = R_i - [R_f + \beta_i(R_m - R_f)] \quad (5)$$

where α_i is the Jensen's Alpha for M-REIT i; R_i is the return of M-REIT i; R_f is the risk-free rate; β_i is the beta coefficient of M-REIT i; and R_m is the return of market portfolio.

A statistical measurement that serves as the indication of fund or security movement is the *R-squared*. The benchmark is the Malaysia Treasury Bill is the 3-month Treasury Bill while for M-REITs, the benchmark is the FBM Kuala Lumpur

Property Index. It can be formulated as below:

$$R = \frac{\beta_i^2 . \sigma_m^2}{\sigma_i^2} \quad (6)$$

where β_i^2 is the square of portfolio *i*'s beta coefficient; σ_m^2 is the variance of return of the market portfolio; $\beta_i^2 . \sigma_m^2$ is the systematic risk component of M-REIT *I*; and σ_i^2 is the variance of return of the portfolio *i*. R-squared values range from 0 to 100. A R-squared of 100 indicates that all movements of M-REIT are completely explained by the movements of the FBM Kuala Lumpur Property Index. A high R-squared value (> 85) indicates that the M-REIT's performance patterns follow the market benchmark while M-REIT with a low R-squared value (< 70) indicates that the M-REIT's performance is less in line with the market benchmark.

RESULTS AND A DISCUSSION

In the period between November 2007 and December 2015 each M-REIT and market portfolio represented by the FBM Kuala Lumpur Property Index is shown in Table 1. The overall average weekly return of all the M-REITs is 0.152%, a return higher compared to the average weekly return of

Table 1
Summary of descriptive statistics

No	M-REITs	Average weekly return (%)	Standard deviation (%)	Minimum weekly return (%)	Maximum weekly return (%)
1	Amanah Harta Tanah PNB	0.095%	1.699%	-8.783%	8.783%
2	Al-'Aqar Healthcare REIT	0.206%	2.448%	-9.568%	17.960%
3	AmFirst Real Estate Investment Trust	0.088%	1.707%	-8.755%	7.596%
4	AmanahRaya Real Estate Investment Trust	0.071%	2.702%	-16.042%	13.036%
5	Atrium Real Estate Investment Trust	0.119%	1.783%	-8.615%	5.761%
6	Axis Real Estate Investment Trust	0.295%	2.535%	-14.320%	8.762%
7	CapitaLand Malaysia Mall Trust	0.223%	2.550%	-8.004%	9.580%
8	Hektar Real Estate Investment Trust	0.096%	2.693%	-13.353%	11.441%
9	IGB Real Estate Investment Trust	0.076%	1.800%	-4.786%	5.909%
10	KLCC Real Estate Investment Trust	0.125%	2.880%	-10.490%	16.325%
11	MRCB-Quill REIT	0.155%	1.535%	-8.215%	5.767%
12	Sunway Real Estate Investment Trust	0.272%	2.053%	-6.234%	6.676%
13	Pavilion Real Estate Investment Trust	0.295%	2.456%	-6.204%	7.540%
14	Tower Real Estate Investment Trust	0.071%	1.868%	-8.338%	7.654%
15	UOA Real Estate Investment	0.121%	2.167%	-7.402%	12.408%
16	YTL Hospitality REIT	0.116%	1.556%	-7.210%	6.766%
	Average	0.152%	2.152%		
	Market Portfolio: FBM Property Index	0.064%	2.552%	-12.353%	11.342%

0.064% for market portfolio. For the study period, Axis REIT performed best with the highest average weekly return of 0.295% outperforming all other M-REITs, while Amanah Raya REIT performed with the lowest average return of 0.071%.

Risk features of M-REITs are reflected in Table 2. M-REITs' beta values were all less than one with an average of 0.17318. The M-REITs' low beta values were less risky than the market being backed by the underlying real estate properties. All M-REITs R2 values, with an average of 0.05711, were extremely low. This indicated that all the M-REITs are very poorly diversified. On average, the total risk of M-REITs that is due to unsystematic risk is very much higher than that of systematic

Table 2
M-REITs risk features

No	REITs	Beta β_i	R-squared	Total risk σ_i^2	Systematic risk $\beta_i^2 \cdot \sigma_m^2$	Unsystematic risk σ_e^2	Diversifiability measure $\frac{\sigma_e^2}{\sigma_i^2}$
1	Amanah Harta Tanah PNB	0.062	0.009	2.885	0.025	2.860	0.991
2	Al-'Aqar Healthcare REIT	0.030	0.001	5.994	0.006	5.988	0.999
3	AmFirst Real Estate Investment Trust	0.236	0.125	2.914	0.364	2.551	0.875
4	AmanahRaya Real Estate Investment Trust	0.106	0.010	7.299	0.073	7.226	0.990
5	Atrium Real Estate Investment Trust	0.205	0.086	3.179	0.273	2.906	0.914
6	Axis Real Estate Investment Trust	0.212	0.045	6.425	0.292	6.133	0.955
7	CapitaLand Malaysia Mall Trust	0.186	0.035	6.503	0.225	6.278	0.965
8	Hektar Real Estate Investment Trust	0.088	0.007	7.252	0.051	7.201	0.993
9	IGB Real Estate Investment Trust	0.182	0.067	3.242	0.216	3.026	0.933
10	KLCC Real Estate Investment Trust	0.206	0.033	8.296	0.277	8.019	0.967
11	MRCB-Quill REIT	0.217	0.130	2.356	0.306	2.050	0.870
12	Sunway Real Estate Investment Trust	0.242	0.091	4.213	0.382	3.831	0.909
13	Pavilion Real Estate Investment Trust	0.225	0.055	6.030	0.330	5.701	0.945
14	Tower Real Estate Investment Trust	0.260	0.127	3.489	0.442	3.048	0.873
15	UOA Real Estate Investment	0.171	0.040	4.694	0.189	4.505	0.960
16	YTL Hospitality REIT	0.142	0.054	2.420	0.131	2.289	0.946
	Average	0.173	0.057	4.824	0.224	4.601	0.943

risk, i.e. 4.60064 and 0.22383 respectively. The diversibility values which range from 0.87028 to 0.99901, with an average of 0.94289, further support that there are notable opportunities for diversification.

The risk-adjusted performance results and rankings of each M-REIT as indicated using Sharpe, Treynor and Jensen measures have been tabulated in Table 3. The observed differences in performance ranking orders are attributed to the assumption of risk measures, standard deviation of return against beta. As earlier indicated, the R-squared values for M-REITs depict low

Table 3
Risk-adjusted performance measures and rankings

REITs	Sharpe Ratio	Ranking	Treynor Ratio	Ranking	Jensen's Alpha	Ranking	Average-score ranking
Axis Real Estate Investment Trust	0.659	1	1.253	2	0.269	1	1
Sunway Real Estate Investment Trust	0.539	2	0.72506	3	0.16540	2	2
Pavilion Real Estate Investment Trust	0.39703	3	0.68778	4	0.14911	3	3
Al-'Aqar Healthcare REIT	0.3522	4	4.52947	1	0.13738	5	4
CapitaLand Malaysia Mall Trust	0.31067	5	0.6772	5	0.11846	6	5
KLCC Real Estate Investment Trust	0.2869	6	0.63591	6	0.13750	4	6
MRCB-Quill REIT	0.27193	7	0.30586	10	0.05899	7	7
YTL Hospitality REIT	0.1847	8	0.32115	9	0.04828	11	9
Atrium Real Estate Investment Trust	0.1654	9	0.22872	12	0.05016	10	11
UOA Real Estate Investment	0.14147	10	0.28535	11	0.05072	9	10
Hektar Real Estate Investment Trust	0.12631	11	0.61086	7	0.05566	8	8
Amanah Harta Tanah PNB	0.08709	12	0.37616	8	0.02152	12	12
AmFirst Real Estate Investment Trust	0.06789	13	0.07784	14	0.01445	13	13
IGB Real Estate Investment Trust	0.04407	14	0.06923	15	0.01022	16	15
Tower Real Estate Investment Trust	0.02988	15	0.03402	16	0.01376	14	16
AmanahRaya Real Estate Investment Trust	0.02365	16	0.09548	13	0.01210	15	14
Market Portfolio: FBM Property Index	-0.005		-0.015				

values implying low reliability of the beta coefficients. As such, Treynor and Jensen's result measures are less reliable. Despite three measures present fairly consistent rankings, average scores are computed to make an objective comparison based on the average-score rankings. The top three noticeable M-REITs are Axis, Sunway, and Pavilion REITs that outperform other M-REITs in the market. The last three M-REITs with relatively poor risk-adjusted performance are Amanah Raya, IGB and Tower REITs that may appear to be less attractive to the investors. By comparing Table1 and Table 3 for the risk-adjusted and -unadjusted returns, the rankings of top three and last three remain. Sharpe and Treynor ratios of FBM Property Index are both in negative values as the property market as a whole underperform during the sample period.

CONCLUSION AND IMPLICATION

This study examined the performance of 16 M-REITs across different industries over an 8-year study period from Nov 2007 and December 2015 using Sharpe, Treynor, and Jensen measures. The results of risk-adjusted and unadjusted returns indicate consistency in the performance of M-REITs. However, the Sharpe ratio tends to exhibit a more reliable indication as low R-squared values implying low reliability in beta coefficients and hence, Treynor ratio and Jensen's alpha are less reliable. Low R-squared values also imply that M-REITs are poorly diversified and therefore showing tremendous diversification opportunity. This finding is further supported by diversifiability measure, as on average, 94.3% of the total risk of M-REITs comes from unsystematic risk component. The beta values of the M-REITs are all less than one (i.e. less risky than the market) since they are secured by underlying real estate properties.

Risk-adjusted and -unadjusted returns present identical results in terms of their performance. All selected samples of M-REITs outperform the market benchmark. This result is not consistent with previous studies. FBM Property Index is employed in this study to represent the real estate sector while FTSE Bursa Malaysia KLCI is employed by other studies examining the Malaysian context. However, it is consistent with the findings that investing in M-REITs provide better returns than real estate properties arising from diversification possibilities of M-REIT portfolio.

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APPENDIX 1

Study period for each M-REIT

		Study Period		
No	REITs	From	Till	Observations
1	Amanah Harta Tanah PNB	24/8/2010	28/12/2015	282
2	Al-'Aqar Healthcare REIT	7/11/2007	28/12/2015	425
3	AmFirst Real Estate Investment Trust	7/11/2007	28/12/2015	425
4	AmanahRaya Real Estate Investment Trust	7/11/2007	28/12/2015	425
5	Atrium Real Estate Investment Trust	7/11/2007	28/12/2015	425
6	Axis Real Estate Investment Trust	7/11/2007	28/12/2015	425
7	CapitaLand Malaysia Mall Trust	16/7/2010	28/12/2015	252
8	Hektar Real Estate Investment Trust	7/11/2007	28/12/2015	425
9	IGB Real Estate Investment Trust	21/9/2012	28/12/2015	172
10	KLCC Real Estate Investment Trust	2/4/2013	28/12/2015	144
11	MRCB-Quill REIT	23/8/2010	28/12/2015	280
12	Sunway Real Estate Investment Trust	8/7/2010	28/12/2015	287
13	Pavilion Real Estate Investment Trust	7/11/2007	28/12/2015	212
14	Tower Real Estate Investment Trust	7/11/2007	28/12/2015	425
15	UOA Real Estate Investment	7/11/2007	28/12/2015	425
16	YTL Hospitality REIT	7/11/2007	28/12/2015	425