EVALUATING THE FINANCIAL PERFORMANCE METRICS OF REAL ESTATE INVESTMENT TRUSTS: IDENTIFYING APPROPRIATE METRICS FOR INVESTMENT ANALYSIS

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Abstract

This study assesses the effectiveness of commonly used financial performance metrics, return on assets (ROA), return on equity (ROE), funds from operations (FFO), and Tobin's Q, in evaluating the financial health of real estate investment trusts (REITs) within the unique regulatory context of Malaysia, thereby identifying the most contextually relevant indicator for emerging REIT markets. The study uses a sample of 17 of the 19 listed REITS on the Malaysian Stock Exchange from 2017 to 2023 to derive a panel dataset. The study employed a static panel regression approach, utilising a two-stage least squares (2SLS) method as an estimation technique. The empirical findings demonstrate that the regression model accounts for approximately 52.4% of the variance observed in the net asset value (NAV). ROE shows a statistically significant positive effect with NAV ($\beta = 15.657$, $p = 0.026$), emphasising its relevance as the most appropriate financial performance indicator within this context. Tobin's Q exhibits a statistically significant negative association with NAV. To address the issue of multicollinearity, ROA and FFO were instrumented using their predicted values. This research addresses a critical gap in existing literature by rigorously evaluating the relevance and effectiveness of conventional financial performance metrics within the unique regulatory and market context.

Keywords: Financial Performance, Malaysian REITs, ROA, ROE, Tobin's Q, FFO

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1. INTRODUCTION

Real estate investment trusts (REITs) were established by Congress in the United States in 1960 (Goddard & Marcum, 2012). REITs oversee assets like office buildings, retail centres, and industrial warehouses. They also manage residential properties, such as apartment complexes and condominiums; healthcare facilities, including hospitals and senior living communities; specialised properties, like data centres and cell towers; and agricultural properties, including palm oil plantations. According to Adnan et al. (2021), REITs earn a substantial part of their income from rent and lease payments in their properties. REITs can generate revenue through property sales, financing, and development projects (Mueller & Anikeeff, 2001). REITs are compelled by regulatory requirements to dispense at least 90% of their taxable income to shareholders through dividends. Despite being exempt from corporate-level taxes, shareholders must pay taxes on dividends at their respective tax rates. As a requirement for a company to be listed as REIT, it must allocate at least 75% of its assets to real estate investments and generate at least 75% of its gross income from real estate-related operations, be an entity that is taxable as a corporation, be managed by a board of directors or trustees, have at least 100 shareholders after its first year of existence, have no more than 50% of its shares held by five or fewer individuals (Cicmil, 2023; Feng et al., 2022). Investing in REITs provides investors with a diversified real estate portfolio spanning different property types, geographic locations, and market sectors, thereby reducing the risk associated with direct ownership of individual properties (Khalifaturofi'ah & Setiawan, 2025; Pavlov & Wachter, 2011).

Although a variety of well-established investment performance indicators, such as return on assets (ROA), return on equity (ROE), funds from operations (FFO), and Tobin's Q, are routinely applied in corporate finance, their relevance to REIT performance assessment remains an open empirical question. Differences in legal frameworks, taxation regimes, disclosure requirements, and macroeconomic environments across jurisdictions can materially alter the informational content of these metrics. Moreover, the unique business model of REITs, characterised by statutory dividend-distribution mandates and a heavy reliance on illiquid, capital-intensive assets, suggests that conventional performance measures developed for industrial or service-sector firms may not fully capture the risk–return profile of property trusts. Hence, a rigorous contextual evaluation is required to ascertain which metrics best reflect the value creation process within specific national REIT markets.

In the Malaysian context, prior studies have examined a range of issues, including dividend policy, capital structure, and comparative returns of Malaysian REITs (M-REITs) (Jalil et al., 2019; Ong et al., 2012). Nevertheless, there is a conspicuous absence of studies that systematically examine the suitability of alternative financial performance metrics for M-REITs. Previous studies in this field typically concentrate on developed economies such as the United States, where regulatory frameworks, investor behaviour, and market maturity differ significantly from those in emerging economies like Malaysia. Given Malaysia's distinctive regulatory environment — combining conventional and Shariah-compliant structures alongside evolving macroeconomic conditions, an evidence-based appraisal of metric relevance is both timely and necessary, and has thus raised a critical question:

RQ: Do conventional performance metrics hold the same explanatory power in emerging REIT markets such as Malaysia?

Addressing this gap will not only enhance academic understanding of performance measurement in emerging REIT markets but also equip investors, asset managers, and policy makers with contextually appropriate tools for evaluating and benchmarking REIT performance. This study, therefore, aims to empirically assess the appropriateness of four widely used financial performance metrics — ROA, ROE, FFO, and Tobin's Q — using net asset value (NAV) per share as the performance benchmark.

Findings from this research will contribute to the existing literature in many ways. Hinging on stakeholders' theory, which assumes that the long-term achievement of a firm depends on its accountability to all its internal and external stakeholders. First, the paper will provide appropriate measures for stakeholders to gauge the effect of any disclosure on the financial health of M-REITs due to their peculiarities and context-specific nature. Second, the paper will contribute to the literature by identifying the most appropriate metrics suitable for capturing financial performance in the Malaysian REIT market. This has practical implications for investors, fund managers, and policymakers operating in emerging REIT markets, who require context-specific performance evaluation tools. Using data from sustainability reports derived from Bursa Malaysia to calculate a novel ROA, ROE, Tobin's Q, and FFO offers a methodological contribution to the field by providing a new database used for measuring the financial performance of M-REITs and thus contributing to building a data bank for M-REIT financial performance metrics.

The rest of the paper is structured as follows. Section 2 provides a relevant literature review, the methodology used in conducting empirical results is presented in Section 3, while the results are presented in Section 4. Discussion and implications of findings are presented in Section 5. Section 6 presents conclusions of the paper.

2. LITERATURE REVIEW

Many financial metrics have been used by different researchers to gauge the financial health of REITs both in developed and developing economies. These metrics play a crucial role in helping investors analyse the operational effectiveness, profitability, and growth potential of REITs. Notable among these metrics are accounting-based metrics; ROA using conventional metrics such as earnings yield and book-to-price to evaluate the financial performance of REITs has raised concerns within the industry (Glascock & Lu-Andrews, 2014; Islamoglu et al., 2015).

ROA is a financial ratio that measures a company's profitability relative to its total assets. The use of ROA to assess the financial performance of REITs among researchers has been receiving an upward trend in recent times (Morri et al., 2021; Noguera, 2020). The research conducted by Oza and Patekar (2024) in Indian to examine the correlation between environmental, social, and governance (ESG)

score and a firm's market performance also utilises ROA and ROE as major financial parameters. A similar trajectory of adopting ROA and ROE as performance metrics was observed in a study done in Africa in research to determine the moderating effects of female boards of directors on the relationship between board characteristics and the performance of banks in Nigeria (Kwarteng et al., 2023). Jewell and Mankin (2011) noted that it is important to consider factors like interest and non-interest income, accounts receivable, and inventory turnover when interpreting the ROA of a REIT. ROE is a financial ratio that measures a company's profitability to its shareholders' equity. This ratio helps assess how effectively a REIT generates profits from shareholders' equity (Heinfeldt & Rindler, 2010). Researchers have used ROE to gauge the financial health of REITs (Alareeni & Hamdan, 2020; Morri et al., 2021). FFO, on the other hand, is one of the most widely used metrics for evaluating REIT performance. It was introduced by the National Association of Real Estate Investment Trusts (NAREIT) as a supplemental measure of the performance of REITs because NAREIT argued that the net income (NI) approach to REIT financial performance measurement is misleading (Gore & Stott, 1998). NAREIT argued that using historical depreciation is inappropriate for income-producing properties as it does not correlate with changes in the values of income-producing assets (Ben-Shahar et al., 2011; Cicmil, 2023). FFO is used as a supplemental measure to NI because it excludes certain non-cash items such as depreciation and amortisation, and has been identified as a fundamental metric in measuring REITs' financial performance than NI (Ben-Shahar et al., 2011).

Tobin's Q is another financial metric that has been used to assess a company's value relative to its assets' replacement cost. Tobin's Q is calculated as the ratio of the market value of a company's assets to the replacement cost of the assets (Butt et al., 2021). The increasing recognition of Tobin's Q in the assessment of REIT performance is evident among scholars and researchers (Alareeni & Hamdan, 2020; Devine et al., 2023; Noguera, 2020). Additionally, a range of other financial indicators are employed for the evaluation of REITs' financial performance, which includes occupancy rate, gross asset value, dividend distribution per unit, debt metrics, dividend yield, total return, price per share/FFO, payout ratio, debt-earnings before interest, taxes, depreciation and amortization, and interest coverage, as discussed by Cicmil (2023). Other metrics used by Benefield et al. (2009) include the Treynor index, double Sharpe ratio, and Jensen's alpha. As the real estate market evolves, the significance of these metrics in evaluating REITs' performance will likely continue growing, shaping investment strategies and decision-making processes in the sector.

Research on the relationship between ESG disclosure and financial performance in the real estate sector presents mixed results due to the different financial metrics used to analyse these complexities in advanced nations (Cajias et al., 2011; Friede et al., 2015; Morri et al., 2024). ESG stands for environmental, social, and governance, and it encompasses a set of criteria used to evaluate a company's operations and performance in relation to sustainability and social impact (Shen, 2023). Assessing the financial performance of M-REITs is crucial for demonstrating their commitment to sustainability and ethical governance in line with ESG principles (Tang, 2023).

The NAV per share is updated at the end of each trading day, meaning that the listed price reflects the previous day's closing value (Tufano et al., 2006). Its mode of assessment emphasises intrinsic value rather than market sentiment. It provides a stable benchmark for evaluating long-term investment performance, particularly in real estate markets that are characterised by lower liquidity and slower price adjustments (Ong et al., 2012). These attributes make NAV preferred over stock price in REIT valuation (Clayton & MacKinnon, 2002).

The development of M-REITs began in 1989 with the introduction of the listed property trust (LPT), making it the first country in Asia to establish property trusts (Newell et al., 2002). Arab Malaysia First Property Trust was the first LPT to be listed on the Kuala Lumpur Stock Exchange in August 1989 (Sing et al., 2002). New guidelines were introduced in June 2005, which led to an increasing number of listed M-REITs to 19 as of March 2024. Fourteen are classified as conventional REITs, while five are Islamic REITs with a total market capitalization of 41 billion of Malaysian ringgits as of December 31, 2023 (Securities Commission of Malaysia, 2024). This has positioned Malaysia among the top five REIT markets in Asia by size and solidified its increasing importance in the Malaysian capital market. M-REITs performed better than investments in other common stocks (Ong et al., 2012). It benefits from unique tax incentives and operates under the oversight of the Securities Commission of Malaysia (Sulaiman et al., 2023). M-REITs operated under distinct regulatory and market dynamics compared to their counterparts in developed markets such as the United States and Australia (Newell & Osmadi, 2010). M-REITs invest across a diverse range of subsectors, including commercial, retail, industrial, healthcare, and hospitality properties. It is distinguished by the presence of Shariah-compliant structures, which must adhere to Islamic principles in asset selection and financing structure, exclusively unique to the Malaysian context (Ong et al., 2012). M-REITs' operational structures and reporting frameworks are different from other listed properties in Bursa Malaysia (Jamaludin et al., 2025).

Prominent among the M-REITs are Pavilion REIT, AXIS REIT, KLCC REIT, IGB REIT, Sunway REIT, Al-Aqar HEA REIT, and Al-Salam REIT. As of June 2024, Pavilion REIT and AXIS REIT are ranked as the top two, with market capitalisations of EUR 1,005.35 million and EUR 750 million, respectively (European Public Real Estate Association [EPRA], 2024). From 2017 to 2023, the M-REIT market expanded by over 25% in market capitalisation, supported by stable dividend yields averaging 5–6% annually (Bursa Malaysia, 2023; EPRA, 2024). This trajectory illustrates Malaysia's cautious regulatory environment, contrasting with the more aggressive growth seen in the US and Australian REIT markets (EPRA, 2024).

3. MATERIALS AND METHODS

3.1. Sample design

The annual sustainability reports of all 19 listed REITs on Bursa Malaysia were considered as

samples. The sustainability reports from 2018 to 2023 were scrutinised to derive appropriate panel data. This period was chosen because it was formally mandated for all the companies listed on the Malaysian Stock Exchange to disclose their sustainability initiatives in their annual reports, effective from the 2017 financial year. After thorough scrutiny, two of the recently listed REITs (IGB Commercial, listed on September 20, 2021, and AME REIT, listed on May 23, 2022) were dropped due to a lack of sustainability reports for the study period. The annual sustainability reports of 17 listed M-REITs were scrutinised, resulting in 102 years of observations to derive appropriate panel data for analysis. The influence of outliers and scale differences among variables, such as FFO and firm age, was addressed by adjusting the scale using logarithmic transformations. This method reduced the impact of extreme values and enabled a more balanced analysis, similar to approaches used in another research (Morri et al., 2024).

3.1.1. Dependent variable

The study has considered the *NAV* per share at the closing of each financial year as a dependent variable against stock price because of its emphasis on intrinsic value in its mode of assessment against market sentiment, which may distort stock prices.

3.1.2. Independent variables

The independent variables are accounting-based *ROA*, *ROE*, and market-based *Tobin's Q*, and *FFO*. The financial data were sourced directly from the annual reports of the respective REITs, accessed through Bursa Malaysia and individual REIT websites.

3.1.3. Control variables

The study considered a few firm-specific control variables. Each company's unique characteristics influence its performance in different ways. Variables such as *leverage*, which is calculated as the ratio of liabilities to total assets, and the *size* and *age* of the firm are said to have impacted their performance. For instance, the degree of leverage will affect the firm's ability to willingly invest in another socially responsible project, which, in most cases, is linked to its financial success. As noted by Fahad and Busru (2021), larger and older firms typically possess more resources, expertise, and experience, allowing them to outperform their peers, which, in turn, impacts their performance. Accordingly, this research controls the effects of these variables by considering leverage, firm size, and age.

3.2. Methodology

To achieve this research objective, the study considered the use of robust two-stage least squares (2SLS) to solve the problem of endogeneity that characterised the panel data. Endogeneity usually arises because of simultaneity or omitted variables, and the issue is resolved with 2SLS by using instrument variables, which ensures independent variables are exogenous. The approach also reduces multicollinearity in the data set by replacing endogenous variables with instrumented values, which eliminates high correlations among predictors. 2SLS also helps account for moderation, where interaction terms are included in a way that does not introduce multicollinearity. Alternatively, a generalized method of moments (GMM) would have been preferred for this study, being a dynamic panel analysis, but the short observations of 120 limit the use of GMM. Hence, the use of 2SLS.

Table 1. Description and calculations of variables used in this study

Variables	***Definitions***	***Empirical evidence from previous research***
ROA	The ROA is the NI received by the firm compared to its total assets. It is calculated by dividing NI by total assets.	Morri et al. (2021), Noguera (2020)
ROE	ROE means the total income the firm receives compared to the total equity. It is calculated by NI divided by total equity.	Alareeni and Hamdan (2020), Morri et al. (2021)
Tobin's Q	Tobin's Q is the product of the total market value of companies divided by total assets. $Q = \frac{Total\ market\ value}{Total\ assets}$	Alareeni and Hamdan (2020), Devine et al. (2023), Noguera (2020)
FFO	FFO is used as a supplemental measure to NI for the measurement of REIT performance. $FFO = Net\ income + Depreciation\ and\ amortisation\ - Gain\ or\ loss\ on\ sale\ of\ real\ estate$	Damani et al. (2024)
NAV	NAV is the price per share of a fund, calculated by subtracting a fund's liabilities from its total assets and dividing by the number of shares outstanding.	Ong et al. (2012)

Source: Authors' elaboration.

Table 2. Explanation of control variables

Variable	***Explanation***	***Reference from previous research***
Leverage	It is calculated as total liabilities over total assets.	Feng et al. (2022)
Size	It is calculated using the logarithm of total assets.	Jamal et al. (2021)
Age	It is derived from the firm's age since its first listing on the stock exchange.	Jamal et al. (2021)

Source: Authors' elaboration.

4. RESULTS

4.1. Descriptive statistics

Table 3 summarises descriptive statistics for the study variables (N = 102). *NAV* per share ranges from 1.002 to 7.390 (M = 1.718, SD = 1.414), indicating substantial cross-firm dispersion in underlying asset backing. *ROA* spans from 0.016 to 0.081 (M = 0.050, SD = 0.013), consistent with modest asset profitability typical of REITs. *ROE* lies between 0.021 and 0.138 (M = 0.085, SD = 0.022), likewise pointing to moderate shareholder returns. *FFO* (log-scaled) varies from 7.072 to 8.813 (M = 8.084, SD = 0.430), suggesting stable operating cash performance with limited volatility. *Tobin's Q* ranges from 0.434 to 1.489 (M = 0.891, SD = 0.245); the mean below unity implies that, on average, market valuations do not fully exceed book values (potential undervaluation or limited growth options). The *leverage* ratio is 0.038–0.554 (M = 0.376, SD = 0.121), indicative of moderate gearing relative to assets. Firm *size* (ln assets) ranges from 8.458 to 10.263 (M = 9.391, SD = 0.412), showing a reasonably tight size distribution. Firm *age*, as recorded in the dataset, spans from 0.000 to1.255 (M = 1.032, SD = 0.213), reflecting variation in listing tenure across the sample.

Table 3. Descriptive statistics

Variable	*Mean*	*Std. dev.*	*Minimum*	*Maximum*	*Observations*
NAV	1.718	1.414	1.002	7.390	102
ROA	0.050	0.013	0.016	0.081	102
ROE	0.085	0.022	0.021	0.138	102
FFO	8.084	0.430	7.072	8.813	102
Tobin's Q (market value to book value ratio)	0.891	0.245	0.434	1.489	102
Leverage (total liabilities ÷ total assets)	0.376	0.121	0.038	0.554	102
Size (natural log of total assets)	9.391	0.412	8.458	10.263	102
Age (years since listing)	1.032	0.213	0.000	1.255	102

Source: Authors' elaboration.

4.2. Diagnostic tests

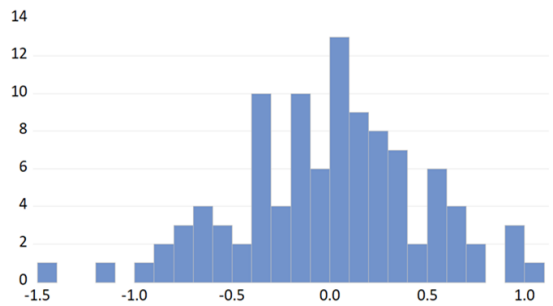
Various diagnostic tests were performed to detect the possible presence of heteroscedasticity and multicollinearity. The result of the pairwise correlation matrix, shown in Table 4, revealed the possible signs of multicollinearity in the data, especially between *ROA* and *ROE*, and between *size* and *FFO*. The pairwise correlation further revealed that *NAV* has a positive correlation with *ROE*, *FFO,* and *size*; however, it exhibits a negative correlation with *ROA*, *leverage*, *Tobin's Q,* and *age*. For the normality test, the Jarque-Bera test was conducted with a Jarque-Bera value of 2.075353 and a p-value of 0.354279, greater than the significance value of 0.05, implying that the data is normally distributed, as seen in Figure 1.

Table 4. Pearson correlation matrix

Variable	*NAV*	*ROA*	*ROE*	*FFO*	*Tobin's Q*	*Leverage*	*Size*	*Age*
NAV	1.000	-0.413**	0.660**	0.500**	-0.052	-0.506**	0.529**	-0.136
ROA		1.000	0.805**	0.174	0.602**	0.138	-0.115	-0.244
ROE			1.000	0.152	0.530	0.547	-0.094	-0.143
FFO				1.000	0.578	-0.193	0.954**	-0.040
Tobin's Q					1.000	0.084	0.427	-0.217
Leverage						1.000	-0.259	0.202
Size							1.000	0.020
Age								1.000

*Note: N = 102. Correlation significant at the 0.05 level (2-tailed) indicated by **.*
Source: Author's result (2025).

Figure 1. The distribution of our data



Note: Series: standardized residuals. Sample: 2018–2023. Observations = 102. Mean = -1.87e-15. Median = 0.044039. Maximum = 1.048527. Minimum = -1.484158. Std. dev. = 0.471852. Skewness = -0.319493. Kurtosis = 3.282866. Jarque-Bera = 2.075343. Probability = 0.354279.
Source: Authors' elaboration.

The presence of heteroscedasticity can affect the validity of a test of significance (Long & Ervin, 2000). The Breusch-Pagan-Godfrey test was conducted to detect the presence of heteroscedasticity. The outcome, as shown in Table 5, returned a significant p-value of 0.000, indicating the presence of heteroscedasticity in the data.

Table 5. Heteroskedasticity test: Breusch-Pagan-Godfrey

F-statistic	10.8071	Prob. F (7.94)	0.0000
Obs. R-squared	45.48355	Prob. chi-square (7)	0.0000
Scaled explained sum of squares	44.09203	Prob. chi-square (7)	0.0000

Source: Authors' elaboration.

4.3. Panel data analysis using two-stage least squares

The various diagnostic tests have revealed a high correlation, multicollinearity, and the presence of heteroscedasticity among the variables. To identify the most suitable model that best explains the relationship between *NAV* per share and relevant financial performance for evaluating M-REITs, the model was initially estimated using ordinary least squares as well as random effects (RE) and fixed effects (FE) models. To determine the preferred model from FE and RE, the Hausman test suggests that the fixed effect is preferred over the RE model (Arellano & Bond, 1991). The result of the test with $p < 0.05$ is presented in Table 6. The use of 2SLS regression was adopted as a robust test to solve the problem of endogeneity that arises because of simultaneity or omitted variables as a preferred model of estimation.

Table 6. Hausman test

Test summary	*Chi-sq. statistic*	*Chi-sq. df*	*Prob.*
Cross-section random	191.099273	7	0.0000

Source: Authors' elaboration.

4.4. Fixed effect model specification

The general form of the 2SLS regression, where the second-stage regression replaces the endogenous variable with its predicted value using the fixed effect model:

$$NAV_{it} = \beta_0 + \beta_1 ROA_{it} + \beta_2 ROE_{it} + \beta_3 FFO_{it} + \beta_4 Tobin's\ Q_{it} + \beta_5 Leverage_{it} + \beta_6 Age_{it} + \beta_7 Size_{it} + \varepsilon_{it} \quad (1)$$

where,

- β_0 = unobserved, time-invariant individual-specific effect for REIT i (capturing firm-specific heterogeneity;
- NAV_{it} = net asset value per share;
- ROA_{it} = return on assets (endogenous);
- ROE_{it} = return on equity;
- FFO_{it} = funds from operations;
- $Tobin's\ Q_{it}$ = Tobin's Q (possibly endogenous);
- $Leverage_{it}$, Age_{it}, $Size_{it}$ = control variables;
- ε_{it} = the error term.

4.5. Sensitivity analysis using two-stage least squares regression

In the analysis of the pairwise correlation matrix, it was observed that multicollinearity exists between *ROA* and *ROE*, as well as between *size* and *FFO*. *ROA* and *FFO* were instrumented to solve the multicollinearity problem by replacing them with their predicted values, which removes their direct correlation. These two correlated variables were excluded in the 2SLS regression to obtain more accurate results. Multicollinearity was then assessed using variance inflation factors (VIF). The results, presented in Table 7, indicate that all VIF values are below the conventional threshold of five, suggesting acceptable multicollinearity levels. 2SLS regression estimation was conducted to ensure unbiased and consistent parameter estimates. The summary of the 2SLS regression is presented in Table 8.

Table 7. Variance inflation factor results

Variable	*VIF*	*Tolerance (1/VIF)*
ROE	2.442	0.410
Tobin's Q	2.189	0.457
Leverage	1.766	0.566
Size	1.546	0.647
Age	1.193	0.838

Source: Authors' elaboration.

Table 8. Two-stage least squares regression results

Variable	*Coefficient (β)*	*Standard error*	*t-Statistic*	*p-value*	*Interpretation*
ROE	15.657	6.902	2.268	0.026	Significant positive effect
Tobin's Q (market value to book value ratio)	-2.607	0.600	-4.346	0.000	Significant negative effect
Leverage ratio (total liabilities ÷ total assets)	-4.801	1.088	-4.412	0.000	Significant negative effect
Firm size (natural log of total assets)	2.197	0.300	7.325	0.000	Significant positive effect
Firm age (years since listing)	-0.845	0.509	-1.660	0.100	Not statistically significant

Note: Dependent variable: NAV. Model statistics: $R^2 = 0.524$. Adjusted $R^2 = 0.499$. F-statistic = 21.150 ($p < 0.001$) = Instrument validity confirmed.
Source: Authors' elaboration.

4.6. Post-estimation specification test

To confirm the validity of the results obtained from the 2SLS regression, a test of model significance was conducted. The result from Table 9 with the F-test at 21.150 greater than the threshold value of 10, and a p-value of 0.000, validated that the model is statistically significant and fit for prediction.

Table 9. Test of significance of the model

Model		*Sum of squares*	*Df*	*Mean square*	*F*	*Sig.*
1	Regression	105.922	5	21.184	21.150	0.000*
	Residual	96.154	96	1.002		
	Total	202.076	101			

*Note: Dependent variable: NAV. * predictors: (Constant), size, age, ROE, leverage, Tobin's Q.*
Source: Authors' elaboration.

5. DISCUSSION AND IMPLICATIONS

The sensitivity analysis implemented through 2SLS estimation (Table 8) and the subsequent post-estimation specification tests (Table 9) collectively affirm the internal consistency and explanatory adequacy of the empirical model. The first-stage instrumentation of ROA and FFO necessitated by multicollinearity diagnostics yields second-stage coefficients that are both economically and statistically robust: the model explains 52.4% of the cross-sectional and inter-temporal variation in NAV per share, with an adjusted R^2 of 0.499 and an F-statistic of 21.15 that comfortably exceeds the conventional threshold for joint significance ($p < 0.001$).

Consistent with the finance literature that emphasises equity efficiency in capital-intensive

industries, ROE exhibits a positive and statistically significant association with NAV (β = 15.657; p = 0.026). The point estimate implies that a one-percentage-point improvement in ROE translates, ceteris paribus, into an increase of approximately 0.16 Malaysian ringgits in intrinsic value per share. An effect that resonates with investor preference for stable dividend streams and disciplined reinvestment of retained earnings. The result corroborates findings for other Asian REIT markets; however, it contrasts with US evidence, wherein FFO tends to dominate valuation models. The divergence underscores the context-specific relevance of equity-based profitability measures in an emerging-market setting characterised by, among other things, modest leverage ceilings, tax incentives, and conservative payout norms.

The significantly negative coefficient on Tobin's Q (β = -2.607; p < 0.001) signals that, for M-REITs, elevated market value over replacement cost is systematically associated with lower intrinsic value. Such an inverse relationship may reflect persistent investor sentiment or information asymmetry that causes price-to-asset discrepancies, thereby attenuating the informative content of Q in thinly traded property markets. Meanwhile, financial leverage also exerts an adverse effect on NAV (β = -4.801; p < 0.001). This debt-overhang penalty is consistent with the pecking-order hypothesis, where higher leverage amplifies cash-flow volatility and refinancing risk, ultimately eroding the present value of future dividends.

Firm size, proxied by the natural logarithm of total assets, is positively related to NAV (β = 2.197; p < 0.001). The coefficient suggests that scale economies, whether through portfolio diversification, bargaining power with tenants, or more favourable debt terms, translate into tangible value premia. By contrast, firm age is statistically inert (p = 0.100), implying that listing tenure *per se* does not confer additional valuation advantages once profitability, leverage, and scale are controlled.

Variance-inflation-factor values below the conventional cut-off of five and the instrument validity implied by the first-stage F-statistic mitigate concerns over residual multicollinearity and weak instruments. The Breusch–Pagan–Godfrey test confirms the presence of heteroskedasticity; however, heteroskedasticity-consistent standard errors preserve inference reliability. Post-estimation diagnostics further indicate that parameter estimates are stable and free from omitted-variable bias, thereby strengthening the causal interpretation of the ROE-NAV nexus in the Malaysian context.

Consequently, the 2SLS results suggest various implications for the respective market participants. For portfolio investors, ROE should become the primary screening and weighting factor when allocating funds to M-REITs: each one-percentage-point improvement in ROE is associated with a material uplift in intrinsic value, whereas elevated Tobin's Q ratios and high leverage systematically erode NAV. Hence, asset allocators are advised to tilt portfolios toward REITs that exhibit consistently strong ROE, moderate debt levels, and market prices that do not substantially exceed replacement cost. From a managerial perspective, boards and executive teams can enhance value by improving capital efficiency through disciplined reinvestment, selective asset recycling, and conservative debt management, thereby reinforcing the positive ROE–NAV linkage identified in the sensitivity analysis. Finally, regulators may wish to strengthen disclosure standards around profitability and leverage; mandatory, standardised ROE reporting and periodic monitoring of sector-wide debt ratios would improve comparative transparency and guard against systemic risk. Given the weak informational content of Tobin's Q in this emerging-market setting, greater transparency in property revaluation practices would further mitigate valuation noise, fostering a more efficient and resilient REIT market in Malaysia.

6. CONCLUSION

This study set out to examine which financial performance metric most effectively captures intrinsic value creation in an emerging-market REIT context. It should be noted that similar research to eliminate the confusion was commissioned by NAREIT, and the outcome favoured the usage of FFO for gauging REITs' financial performance as against NI (Damani et al., 2024). The level of development and advancement in nations differs from one another, the social-political situations also differ from nation to nation, and economic indices differ from one country to another; hence, adopting NAREIT recommendations hook, line, and sinker for developing economies like Malaysia may be inappropriate.

Using a balanced panel of 17 M-REITs over 2017–2023 and a 2SLS framework that corrects for endogeneity, multicollinearity and heteroskedasticity, we explain just over half of the cross-sectional and inter-temporal variation in NAV per share. The sensitivity analysis unequivocally shows that ROE exerts the most significant and robust influence on NAV, while Tobin's Q and financial leverage display significant value-eroding effects. Firm size contributes positively through scale economies, whereas listing tenure is not independently value-relevant once profitability and leverage are controlled.

These findings carry three principal implications. First, for investors, ROE should serve as the dominant screening and weighting criterion in M-REIT portfolios, supplemented by prudent ceilings on leverage and vigilant monitoring of excessive market-to-asset premiums. Second, REIT managers can enhance shareholder value by concentrating on equity-efficient capital allocation, disciplined reinvestment, and conservative debt management, actions that reinforce the positive ROE–NAV linkage documented here. Third, regulators and capital market authorities may wish to elevate ROE disclosure to the same statutory importance long accorded to FFO in developed markets, while simultaneously tightening oversight of sector-wide leverage profiles and asset-revaluation practices.

By empirically demonstrating that equity-based profitability, rather than cash-flow or market-value proxies, best explains intrinsic value in Malaysia's REIT sector, the study provides a context-specific counterpoint to the prevailing emphasis on FFO in mature REIT markets. More broadly, the results caution against the wholesale transplantation of performance benchmarks from advanced economies to emerging ones without rigorous empirical validation.

Admittedly, the analysis is limited by its focus on four conventional metrics and a single jurisdiction. Future research should extend the comparative lens to other emerging REIT markets and employ dynamic, causal-inference

techniques to gauge the persistence and transmission mechanisms of profitability shocks. Such endeavours would deepen our collective understanding of how institutional heterogeneity shapes metric relevance and, in turn, informs capital-allocation efficiency across the global REIT landscape.

REFERENCES

Adnan, Y. M., Lamin, N., Razali, M. N., Jalil, R. A., & Esha, Z. (2021). Real estate investment trusts' (REITs) asset management strategies within global REIT portfolios. *Real Estate Management and Valuation, 29*(1), 72–86. https://doi.org/10.2478/remav-2021-0007

Alareeni, B. A., & Hamdan, A. (2020), ESG impact on performance of US S&P 500-listed firms. *Corporate Governance, 20*(7), 1409–1428. https://doi.org/10.1108/CG-06-2020-0258

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968

Benefield, J. D., Anderson, R. I., & Zumpano, L. V. (2009). Performance differences in property-type diversified versus specialised real estate investment trusts (REITs). *Review of Financial Economics, 18*(2), 70–79. https://doi.org/10.1016/j.rfe.2008.04.001

Ben-Shahar, D., Sulganik, E., & Tsang, D. (2011). Funds from operations versus net income: Examining the dividend relevance of REIT performance measures. *Journal of Real Estate Research, 33*(3), 415–442. https://doi.org/10.1080/10835547.2011.12091308

Bursa Malaysia. (2023). *Annual market review 2023.* https://www.bursamalaysia.com/market_information/announcements/company_announcement

Butt, M. N., Baig, A. S., & Seyyed, F. J. (2021). Tobin's Q approximation as a metric of firm performance: An empirical evaluation. *Journal of Strategic Marketing, 31*(3), 532–548. https://doi.org/10.1080/0965254X.2021.1947875

Cajias, M., Fuerst, F., McAllister, P., & Nanda, A. (2011). *Is ESG commitment linked to investment performance in the real estate sector?* https://www.researchgate.net/publication/254447536

Chiang, S. L., & Tsai, M. S. (2023). Analyses for the effects of investor sentiment on the price adjustment behaviors for stock market and REIT market. *International Review of Economics & Finance, 86*, 425–439. https://doi.org/10.1016/j.iref.2023.03.007

Cicmil, D. (2023). The financial performance of selected REITs from S&P 500. *Anali Ekonomskog Fakulteta u Subotici, 59*(49), 99–115. https://doi.org/10.5937/AnEkSub2200007C

Clayton, J., & MacKinnon, G. (2002). *Departures from NAV in REIT pricing: The private real estate cycle, the value of liquidity and investor sentiment* (Real Estate Research Institute, Working Paper). Real Estate Research Institute. https://www.reri.org/research/article_pdf/wp106.pdf

Damani, A., Nguyen, A. T., & Pratima, F. N. U. (2024). Navigating real estate investment trust performance dynamics: The role of style (equity vs. mortgage real estate investment trusts) and diversification amidst the COVID-19 pandemic. *Journal of Risk and Financial Management, 17*(5), Article 202. https://doi.org/10.3390/jrfm17050202

Devine, A., Kok, N., & Wang, C. (2023). Sustainability disclosure and financial performance: The case of private and public real estate. *The Journal of Portfolio Management*, *49*(10), 119–133. https://doi.org/10.3905/jpm.2023.1.534

European Public Real Estate Association (EPRA). (2024). *Global REITs survey*. https://www.epra.com/public-affairs/global-reit-survey

Fahad, P., & Busru, S. A. (2021). CSR disclosure and firm performance: Evidence from an emerging market. *Corporate Governance: The International Journal of Business in Society, 21*(4), 553–568. https://doi.org/10.1108/CG-05-2020-0201

Feng, Z., Hardin III, W. G., & Wang, C. (2022). Rewarding a long-term investment strategy: REITs. *Journal of Real Estate Research, 44*(1), 56–79. https://doi.org/10.1080/08965803.2021.2001896

Feng, Z., Lin, Z., & Wu, W. (2020). *CEO influence on funds from operations (FFO). Adjustment for real estate investment trusts (REITs).* https://doi.org/10.2139/ssrn.3591764

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment, 5*(4), 210–233. https://doi.org/10.1080/20430795.2015.1118917

Glascock, J. L., & Lu-Andrews, R. (2014). *The profitability premium in real estate investment trusts.* https://doi.org/10.2139/ssrn.2375431

Goddard, G. J., & Marcum, B. (2012). Real estate investment trusts (REITs). In *Real estate investment: A value based approach* (pp. 253–272). Springer. https://doi.org/10.1007/978-3-642-23527-6_12

Gore, R., & Stott, D. M. (1998). Toward a more informative measure of operating performance in the REIT industry: Net income vs. funds from operations. *Accounting Horizons, 12*(4), 323–339. https://www.proquest.com/openview/b40877a55cbd00d36d545a83eca9400e/1?pq-origsite=gscholar&cbl=3330

Heinfeldt, J., & Rindler, D. (2010). The calculation of ROE: Pedagogical issues and integrative opportunities. *American Journal of Business Education, 3*(9), 23–26. https://doi.org/10.19030/ajbe.v3i9.477

Islamoglu, M., Apan, M., & Oztel, A. (2015). An evaluation of the financial performance of REITS in Borsa Istanbul: A case study using the entropy-based TOPSIS method. *International Journal of Financial Research, 6*(2), 124–138. https://doi.org/10.5430/ijfr.v6n2p124

Jalil, R. A., Sapri, M., & Ping, T. C. (2019). Linkages between capital structure policy and Malaysian real estate investment trusts property portfolio enlargement. *IOP Conference Series: Materials Science and Engineering, 620*, Article 012008. https://doi.org/10.1088/1757-899X/620/1/012008

Jamal, S., Malik, M. F., & Ahmed, W. (2021). ESG and financial performance in case of Malaysia. *Global Management Sciences Review, 6*(3), 33–53. https://doi.org/10.31703/gmsr.2021(VI-III).03

Jamaludin, A. F., Husain, M. F. H., & Razali, M. N. (2025). Assessing environmental, social and governance of property-listed companies in Malaysia. *Property Management, 43*(3), 469–489. https://doi.org/10.1108/PM-03-2024-0022

Jewell, J. J., & Mankin, J. A. (2011). What is your ROA? An investigation of the many formulas for calculating return on assets. *Academy of Educational Leadership Journal, 15*, 79–91. https://ssrn.com/abstract=2155943

Khalifaturofi'ah, S. O., & Setiawan, R. (2025). Profitability's impact on firm value in Indonesia's real estate firms: A panel data investigation. *Property Management, 43*(2), 169–186. https://doi.org/10.1108/PM-08-2023-0082

Kwarteng, P., Appiah, K. O., & Agana, J. A. (2023). Sustainability performance of firms in the emerging economy: The role of corporate governance and corporate strategy. *Corporate Governance and Sustainability Review, 7*(3), 21–33. https://doi.org/10.22495/cgsrv7i3p2

Long, J. S., & Ervin, L. H. (2000). Using heteroscedasticity-consistent standard errors in the linear regression model. *The American Statistician, 54*(3), 217–224. https://doi.org/10.1080/00031305.2000.10474549

Morri, G., Anconetani, R., & Benfari, L. (2021). Greenness and financial performance of European REITs. *Journal of European Real Estate Research, 14*(1), 40–61. https://doi.org/10.1108/JERER-05-2020-0030

Morri, G., Yang, F., & Colantoni, F. (2024). Green investments, green returns: Exploring the link between ESG factors and financial performance in real estate. *Journal of Property Investment & Finance, 42*(5). https://doi.org/10.1108/JPIF-09-2023-0084

Mueller, G. R., & Anikeeff, M. A. (2001). Real estate ownership and operating businesses: Does combining them make sense for REITs? *The Journal of Real Estate Portfolio Management, 7*(1), 55–65. https://doi.org/10.1080/10835547.2001.12089628

Newell, G., & Osmadi, A. (2010). Assessing the importance of factors influencing the future development of REITs in Malaysia. *Pacific Rim Property Research Journal, 16*(3), 358–374. https://doi.org/10.1080/14445921.2010.11104309

Newell, G., Hwa, T., & Acheampong, P. (2002). Listed property trusts in Malaysia. *Journal of Real Estate Literature, 10*(1), 109–118. https://doi.org/10.1080/10835547.2002.12090104

Noguera, M. (2020). Women directors' effect on firm value and performance: The case of REITs. *Corporate Governance: The International Journal of Business in Society, 20*(7), 1265–1279. https://doi.org/10.1108/CG-02-2020-0057

Ong, T. S., 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), 73–84. https://doi.org/10.5539/ijef.v4n5p73

Ooi, J., Newell, G., & Sing, T. F. (2006). The growth of REIT markets in Asia. *Journal of Real Estate Literature, 14*(2), 203–222. https://doi.org/10.1080/10835547.2006.12090182

Oza, P., & Patekar, A. (2024). Does environmental, social, and governance strategy lead to better firm performance: Analysis of NIFTY 500 companies. *Corporate Governance and Sustainability Review, 8*(2), 24–36. https://doi.org/10.22495/cgsrv8i2p2

Pavlov, A. D., & Wachter, S. M. (2011). *REITs and underlying real estate markets: Is there a link?* (University of Pennsylvania Law School, Research Paper No. 11-20). https://doi.org/10.2139/ssrn.1879968

Securities Commission. (2024). *Real estate investment trust statistics*. https://www.sc.com.my/api/documentms/download.ashx?id=08d48b69-429a-4bc2-955d-7d8b0e47da5f

Shen, Y. (2023). ESG and firm performance: A literature review. *BCP Business & Management, 46*, 283–288. https://doi.org/10.54691/bcpbm.v46i.5107

Sing, T., Ho, K., & Mak, M. (2002). Real estate market reaction to public listing and acquisition news of Malaysian REITs. *Journal of Real Estate Portfolio Management, 8*(3), 209–227. https://doi.org/10.1080/10835547.2002.12089668

Sulaiman, N. A., Hing, L. K., Shahimi, S., & Sulaiman, S. (2023). The impact of financial determinants on Malaysian REITS' performance. *Journal of Business Management and Accounting, 13*(1), 1–30. https://doi.org/10.32890/jbma2023.13.1.1

Tang, K. H. D. (2023). A review of environmental, social and governance (ESG) regulatory frameworks: Their implications on Malaysia. *Tropical Aquatic and Soil Pollution, 3*(2), 168–183. https://doi.org/10.53623/tasp.v3i2.282

Tufano, P., Quinn, M., & Taliaferro, R. (2006). *Live prices and stale quantities: T+1 accounting and mutual fund mispricing* (HBS Finance Working Paper No. 881615). https://doi.org/10.2139/ssrn.881615