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COMPARATIVE ANALYSIS OF REITs AND InvITs IN INDIA: EVALUATING RISK-ADJUSTED PERFORMANCE

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Abstract

This study conducts a comprehensive comparative analysis of three Indian Real Estate Investment Trusts (REITs) and three Infrastructure Investment Trusts (InvITs), assessing their performance against traditional market benchmarks—NIFTY 50 and NIFTY REITs & InvITs Index. Spanning July 2021 to December 2024, the research employs key financial metrics including CAGR, Sharpe Ratio, Treynor Ratio, Jensen's Alpha, Beta, Sortino Ratio, and Maximum Drawdown across daily, quarterly, and semi-annual intervals. The findings reveal that while REITs and InvITs underperform in capital appreciation relative to NIFTY 50, they offer superior dividend yields and exhibit lower volatility, making them attractive for income-focused and risk-averse investors. Risk-adjusted return metrics suggest mixed outcomes—some instruments deliver defensive benefits, while others fail to outperform benchmarks. Dividend yield analysis further highlights substantial income advantages over equity indices, though sustainability remains a concern for certain InvITs. Overall, REITs and InvITs emerge as viable diversification tools within Indian portfolios, particularly for investors seeking stable income with moderate risk exposure. However, their future role hinges on factors like market liquidity, macroeconomic conditions, and regulatory evolution.

Keywords: REITs, InvITs, Risk-Return Analysis, Benchmark Comparison, Sharpe Ratio.

INTRODUCTION

The Indian financial market has witnessed a transformative shift with the introduction of real estate investment funds (REITs) and infrastructure investments (InvITs) - two innovative investment vehicles intended to mobilize capital for real estate and infrastructure sectors.

These tools offer investors a unique mixture of stable income generation and potential evaluation of capital, while dealing with the growing demand of the country after infrastructure financing. However, their performance in relation to traditional market indices such as Nifty 50 and Nifty REITs & InvITs Index remains the area of critical analysis.

The aim of this study is to provide comparative evaluation of REITs, InvITs, Nifty 50 and Nifty REITs and InvITs on the Indian market focusing on key financial metrics such as yield, risk and revenue. While REITs and InvITs were placed as stable, income assets, their revenues adapted to the risk of wider real estate and infrastructure shares must be further explored.

By exploring historical performance, volatility and income division, this research seeks to determine whether these alternative investment structures provide excellent revenues adapted to the risk compared to their counterparts.

As the Indian infrastructure and the real estate industry play a key role in economic growth, it is an understanding of how these investment vehicles are carried out compared to traditional indicators, and retail investors are essential for institutional and retail investors.

By analyzing the consistency of revenue, market risks and return efficiency, this study will offer knowledge based on data to the developing role of REITs and InvITs in the Indian investment environment. These findings will help investors, creators of creators and financial analysts take informed decisions on the strategies of the allocation of assets in a rapidly changing economic environment.

LITERATURE REVIEW

Bathia et al. (2024) compared Indian REITs and InvITs, noting their stable yields but underperformance during bull markets. Danila (2025) found that REITs in Malaysia, Singapore, and Thailand are highly sensitive to stock and currency volatility. Baghlaf et al. (2025), using the Fama-French three-factor model, identified foreign investment, political stability, and commodity prices as key drivers in emerging markets.

Similarly, Coskun et al. (2017) found Turkish REITs better explained by the Fama-French model than CAPM, with small-cap and defensive traits aiding diversification. In India, Jaishankar et al. (2022) and Kumar (2023) highlighted InvITs' superior yields compared to traditional debt instruments, albeit with limited global integration.

Liquidity challenges restricting retail access were noted by Boddu (2021) and Vasani (2019), who also observed increasing InvIT adoption due to declining bank credit. Shah and Bhagwat (2022) emphasized the nascent stage of India's InvIT market and low retail participation, a theme echoed by Sodani (2023), who credited fintech and regulatory reforms for improving access to alternative investments.

From the retail angle, Sandeep and Chaya (2023) noted REITs offer downside protection, while Yadav and Verma (2024) found InvITs attractive to institutions due to steady cash flows. Globally, Xu (2023) compared REIT markets in the U.S. and China, identifying regulatory restrictions as a barrier to growth in China. Shafique et al. (2025) found long-term co-movement potential between REITs and stocks in Pakistan, and Essa and Giouvris (2023) linked U.S. REIT performance to liquidity and distress during market shocks. Basse et al. (2009) highlighted heightened volatility in U.S. REITs during the global financial crisis.

Zhang et al. (2023) identified momentum as a primary driver of REIT returns across five countries during COVID-19, with limited impact from skewness and kurtosis. Historically, Chan et al. (1990) found U.S. REITs less risky than stocks but ineffective as inflation hedges or excess return generators.

Zhou and Lee (2013), applying the Adaptive Market Hypothesis, showed evolving REIT efficiency from 1980–2009 due to reforms and macroeconomic shifts. Ooi, Newell, and Sing (2006) noted rapid REIT growth in Japan and Singapore (2001–2005) driven by supportive policies, while countries like South Korea, Hong Kong, and Malaysia lagged due to policy constraints and lower returns.

To evaluate REIT/InvIT performance across risk environments, foundational models are widely applied. Sharpe (1966) assessed excess return per unit of total risk; Treynor (1965) focused on return relative to systematic risk; Jensen (1968) introduced alpha for active portfolio performance; Sortino and van der Meer (1991) refined this with downside-risk-focused Sortino Ratio; and Magdon-Ismail & Atiya (2004) highlighted Maximum Drawdown to capture worst-case losses.

Research Objectives

1. To evaluate the performance of the selected REITs (Embassy Office Parks REIT, Mindspace Business Parks REITs, and Brookfield India Real Estate Trust) and InvITs (Powergrid Infrastructure Investment Trust, IRB InvIT Fund, and IndiGrid Infrastructure Trust Unit) in the Indian market over a specified multi-year period.
2. To compare risk-adjusted returns against traditional market benchmarks (NIFTY 50, NIFTY REITs & InvITs) using metrics such as CAGR, Sharpe Ratio, Treynor Ratio, Beta, and Jensen's Alpha.
3. To explore the potential of REITs and InvITs for enhanced portfolio diversification and lower market risk exposure relative to cap-weighted equity indices.
4. To contribute to the literature on alternative asset classes in emerging markets, offering insights for investors and portfolio managers within the Indian context.

Research Gap:

While REITs and InvITs have gained increasing prominence in India as alternative investment vehicles, empirical research that thoroughly compares their performance to established equity benchmarks under Indian market conditions remains limited. Much of the existing literature focuses on mature markets, overlooking emerging economies and their distinctive regulatory, liquidity, and market-volatility factors. Additionally, prior studies often center on a single time horizon, leaving a gap in understanding how REIT and InvIT performance metrics—such as Sharpe Ratio, Treynor Ratio, Jensen's Alpha, and Maximum Drawdown—vary across daily, quarterly, and semiannual periods. This research aims to address these gaps by providing a multi-horizon, risk-adjusted analysis of REITs and InvITs in India, thereby offering valuable insights for investors, portfolio managers, and policymakers seeking to optimize asset allocation and manage market risk.

Hypothesis

H0: There is no statistically significant difference in the risk-adjusted performance of the REITs/InvITs compared to their corresponding benchmark indices over the observed period.

METHODOLOGY

1. Data Collection

Data was sourced from NSE India, covering three and a half years from July 1, 2021, to December 31, 2024. The instruments selected for analysis include:

REITs

- Embassy Office Parks REIT
- Mindspace Business Parks REITs
- Brookfield India Real Estate Trust
- Benchmarked against NIFTY 50 and NIFTY REITs & InvITs

InvITs

- Powergrid Infrastructure Investment Trust
- IRB InvIT Fund
- IndiGrid Infrastructure Trust Unit
- Benchmarked against NIFTY 50 and NIFTY REITs & InvITs

2. Performance Metrics

- **Annualized CAGR** (Compounded Annual Growth Rate) measures the mean annual growth rate of an investment over a specified period, factoring in compounding each year.

$$CAGR = \left(\frac{FV}{PV}\right)^{1/N} - 1$$

Where,

FV: Final value of the investment

PV: Initial value of the investment

N: Number of years

- **Sharpe ratio** compares the return of an investment over its risk (volatility).

$$Sharpe\ Ratio = \frac{(CAGR - Rf)}{\delta}$$

Where,

CAGR: Compounded Annual Growth Rate

Rf: Risk-free rate of return

δ: Standard deviation of the investment's return

- **Treynor's ratio** measures returns earned more than the risk-free rate per unit of market risk (beta).

$$Treynor's\ ratio = \frac{(CAGR - Rf)}{\beta}$$

Where,

CAGR: Compounded Annual Growth Rate

Rf: Risk-free rate of return

β: Beta of the index

- **Beta** measures the volatility or systematic risk of a security or portfolio about the market.

$$\beta = \frac{Covariance(Ri, Rm)}{Variance\ (Rm)}$$

Where,

Ri: Return on investment

Rm: Return on market

- **Jensen's Alpha** represents the excess return of an investment relative to the return of a benchmark index.

$$Jensen's\ Alpha\ =\ Ri\ -\ [\,(Rf\ +\ \beta \times (Rm\ -\ Rf)]$$

Where,

Ri: Actual return on the investment

Rf: Risk-free rate

Rm: Market return

- **Sortino Ratio** measures return per unit of downside risk

$$Sortino\ Ratio\ =\frac{(CAGR\ -Rf)}{\delta\ downside}$$

Where,

CAGR: Compounded Annual Growth Rate

Rf: Risk-free rate of return

$\delta downside$: Standard deviation of returns below a defined minimum acceptable return

- **Maximum Drawdown** is a measure of the largest peak-to-trough decline in the value of an investment over a given period.

$$Maximum\ Drawdown\ =\frac{(Trough\ Value-\ Peak\ Value)}{Peak\ Value}$$

DATA ANALYSIS AND FINDINGS

I) Benchmarks

i) The traditional Nifty 50 Index serves as the benchmark:

Table 1: Performance of Nifty 50 Index

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	12.4523%	2.1238%	4.5179%
Annualized CAGR		8.7695%	9.2399%
Standard Deviation	0.008731406	0.070248173	0.08753986
Annualized Standard Deviation	0.138606765	0.140496346	0.123800057
Sharpe Ratio	0.408445335	0.140824099	0.197812473
Covariance	0.000076237	0.004934806	0.007663227
Variance	0.000076237	0.004934806	0.007663227
Beta	1	1	1
Jensen's Alpha	0.0000%	0.0000%	0.0000%
Treynors Ratio	0.056613287	0.019785271	0.024489195
Maximum Drawdown	-17.2298%	-10.4319%	-9.0688%
Sortino Ratio	0.60	0.65	0.73

- The Daily CAGR (12.45%) is the highest, reflecting strong short-term growth, while Quarterly (2.12%) and Semi-Annual (4.51%) values are lower due to periodic market fluctuations. Annualized CAGR (8.77% to 9.23%) stabilizes over longer periods, indicating consistent long-term growth despite short-term volatility.
- Daily volatility (0.87%) appears low but annualizes to 13.86%, highlighting significant fluctuations over a full year. Quarterly (7.02%) and Semi-Annual (8.75%) volatility increase as market movements accumulate over time.
- The Sharpe Ratio is highest for daily (0.408) but declines in Quarterly (0.1408) and Semi-Annual (0.1978), suggesting that short-term returns provide better risk-adjusted performance.
- Conversely, the Sortino Ratio improves over time (0.60 to 0.65 to 0.73), indicating that downside risk is lower for long-term investors.
- Maximum Drawdown (MDD) is highest in daily data (-17.23%), exposing short-term investors to greater downside risk. Quarterly (-10.43%) and Semi-Annual (-9.07%) drawdowns are smaller, reflecting partial recovery over longer horizons.
- The Daily Treynor's Ratio (0.0566) is the highest, meaning short-term returns are more favorable per unit of market risk. Quarterly (0.0198) and Semi-Annual (0.0245) values decrease, indicating that long-term investors experience lower excess returns relative to systematic risk.

ii) Nifty REITs and InvITs Index

Table 2: Performance of Nifty REITs and InvITs Index

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	3.4517%	0.7351%	1.0317%
annualized CAGR		2.9729%	2.0740%
Standard Deviation	0.005791488	0.038638175	0.055425021
Annualized Standard Deviation	0.091937027	0.077276349	0.078382816
Sharpe Ratio	-0.363221213	-0.494080089	-0.601789138
Covarience	0.000033541	0.001492909	0.003071933
variance	0.000033541	0.001492909	0.003071933
Beta	1	1	1
Jensen's Alpha	0.0000%	0.0000%	0.0000%
Treynors Ratio	-0.033393478	-0.038180706	-0.047169927
Maximum Drawdown	-16.7613%	-12.5512%	-11.5926%
Sortino Ratio	-0.47	-0.50	-0.44

- The Daily CAGR (3.45%) is the highest, indicating modest short-term growth, while Quarterly (0.73%) and Semi-Annual (1.03%) values are lower, reflecting periodic market fluctuations. Annualized CAGR (2.97% to 2.07%) stabilizes over longer periods, suggesting steady but relatively slow long-term growth.
- Daily volatility (0.58%) appears low but annualizes to 9.19%, showing a moderate level of price fluctuations. Quarterly (3.86%) and Semi-Annual (5.54%) volatility remain relatively stable, indicating that price variations accumulate gradually over time.

- The Sharpe Ratio is negative across all timeframes (-0.36 to -0.60), suggesting that returns have not sufficiently compensated for the risk taken. Similarly, the Sortino Ratio remains negative (-0.47 to -0.50 to -0.44), indicating that downside risk-adjusted returns remain weak across different periods.
- Maximum Drawdown (MDD) is highest in daily data (-16.76%), showing that short-term investors experience significant downside risk. Quarterly (-12.55%) and Semi-Annual (-11.59%) drawdowns are lower, reflecting partial recovery over longer holding periods.
- The Daily Treynor's Ratio (-0.0339) is negative, indicating that short-term excess returns per unit of market risk are not favorable. Quarterly (-0.0381) and Semi-Annual (-0.0472) values remain negative, confirming that the benchmark does not generate strong risk-adjusted returns over time.

II) REITs and InvITs Comparison with each benchmark

i) Embassy Office Parks REIT

i. a) Keeping the benchmark as Nifty 50 Index

Table 3: Performance of Embassy REIT with Nifty 50 as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	1.8389%	0.6160%	1.2119%
Annualized CAGR		2.4867%	2.4384%
Standard Deviation	0.012302391	0.071065633	0.100979742
Annualized Standard Deviation	0.195294396	0.142131266	0.142806921
Sharpe Ratio	-0.253572879	-0.302837176	-0.304787272
Covariance	0.000010755	0.00024293	-0.002688515
Variance	0.000076237	0.004934806	0.007663227
Beta	0.141074749	0.049227886	-0.350833207
Jensen's Alpha	-5.7508%	-4.4017%	-3.4934%
Treynors Ratio	-0.351029242	-0.874354656	0.124063888
Maximum Drawdown	-28.1291%	-22.0598%	-22.0598%
Sortino Ratio	-0.24	-0.41	-0.35

- CAGR: Daily (1.83%) is the highest but far below NIFTY 50 (12.45%). Quarterly (0.61%) and Semi-Annual (1.21%) CAGR also lag, with annualized returns (2.49%–2.44%) confirming long-term underperformance.
- Volatility: Embassy REIT is more volatile than NIFTY 50, with annualized volatility of 19.53% vs 13.86%. Risk increases with holding period—Quarterly (7.02%), Semi-Annual (10.09%).
- Risk-Adjusted Returns: Sharpe and Sortino Ratios are negative across all timeframes, indicating poor compensation for risk and weak downside protection.
- Drawdown: Embassy REIT has experienced deeper losses than NIFTY 50—Daily MDD (-28.13%) vs NIFTY 50 (-17.23%). Quarterly and Semi-Annual MDDs remain high at -22.06%.

- Beta & Systematic Risk: Embassy REIT shows very low Beta (0.14 daily to -0.35 semi-annual), indicating minimal correlation with the market. However, this low beta does not translate into better performance.
- Treynor & Jensen's Alpha: Negative Treynor Ratios for daily and quarterly periods suggest poor return per unit of market risk. Jensen's Alpha is also negative (-5.75% to -3.49%), confirming consistent underperformance relative to market expectations.

i. b) Keeping the benchmark as Nifty REITs and InvITs Index

Table 4: Performance of Embassy REIT with Nifty REITs and InvITs Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	1.8389%	0.6160%	1.2119%
Annualized CAGR		2.4867%	2.4384%
Standard Deviation	0.012302391	0.071065633	0.100979742
Annualized Standard Deviation	0.195294396	0.142131266	0.142806921
Sharpe Ratio	-0.253572879	-0.302837176	-0.304787272
Covariance	0.000057960	0.002264799	0.004917627
Variance	0.000033541	0.001492909	0.003071933
Beta	1.728019019	1.517037873	1.600825027
Jensen's Alpha	0.8183%	1.4879%	3.1985%
Treynors Ratio	-0.02865788	-0.028372813	-0.027189562
Maximum Drawdown	-28.1291%	-22.0598%	-22.0598%
Sortino Ratio	-0.24	-0.41	-0.35

- CAGR: Daily CAGR (1.83%) is below the NIFTY REITs & InvITs Index (3.45%). Quarterly (0.61%) and Semi-Annual (1.21%) values show limited growth, with Annualized returns (2.48%–2.43%) confirming consistent underperformance over time.
- Volatility: Embassy REIT is significantly more volatile than the benchmark. Annualized daily volatility (19.53%) is much higher than the index (9.19%), with elevated Quarterly (7.10%) and Semi-Annual (10.09%) figures.
- Risk-Adjusted Returns: Sharpe (-0.25 to -0.30) and Sortino (-0.24 to -0.41) Ratios are negative across all periods, indicating poor compensation for both total and downside risk.
- Drawdowns: Embassy REIT experienced deeper losses than the index—Daily MDD at -28.12% vs -16.76%, with persistent drawdowns of -22.06% in both Quarterly and Semi-Annual periods.
- Treynor's Ratio: Negative across all timeframes—Daily (-0.0286), Quarterly (-0.0283), and Semi-Annual (-0.0271)—signifying consistently weak returns per unit of market risk.

ii) Mindspace Business Parks REIT

ii. a) Keeping the benchmark as Nifty 50 Index

Table 5: Performance of Mindspace REIT with Nifty 50 as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	0.5486%	0.2202%	-1.1050%
Annualized CAGR		0.8837%	-2.1978%
Standard Deviation	0.010781352	0.067700378	0.109823373
Annualized Standard Deviation	0.171148655	0.135400756	0.155313704
Sharpe Ratio	-0.364737098	-0.436285845	-0.578750394
Covariance	0.000015462	-0.00078117	-0.004483667
Variance	0.000076237	0.004934806	0.007663227
Beta	0.202814503	-0.158298024	-0.585088601
Jensen's Alpha	-7.3906%	-5.5941%	-7.5560%
Treynors Ratio	-0.30778994	0.373178588	0.153631206
Maximum Drawdown	-30.9042%	-28.1810%	-28.1810%
Sortino Ratio	-0.40	-0.46	-0.38

- The Daily CAGR (7.34%) is the highest, showing moderate short-term growth. However, Quarterly (1.18%) and Semi-Annual (1.42%) CAGR values drop significantly, indicating weaker performance over longer periods. Annualized CAGR (4.79% to 2.87%) stabilizes over time, but the decline suggests volatility impacts long-term returns.
- Daily volatility (1.02%) annualizes to 16.21%, which is higher than NIFTY 50 (13.86%), meaning Mindspace REIT experiences greater price fluctuations. Quarterly (5.13%) and Semi-Annual (7.90%) volatility levels indicate an increasing risk over extended timeframes.
- The Sharpe Ratio is slightly positive in daily data (0.03), suggesting a small excess return per unit of risk in the short term. However, Quarterly (-0.19) and Semi-Annual (-0.35) Sharpe Ratios turn negative, indicating that risk-adjusted performance declines over time.
- Maximum Drawdown (MDD) is highest in daily data (-23.52%), meaning Mindspace REIT faces significant downside risk. Quarterly (-15.14%) and Semi-Annual (-11.78%) drawdowns improve, showing some recovery over longer horizons.
- The Daily Treynor's Ratio (0.0512) is positive, meaning short-term excess returns per unit of market risk are favorable. Quarterly (-2.83) and Semi-Annual (0.17) values vary, highlighting an unstable risk-return relationship.

ii. b) Keeping the benchmark as Nifty REITs and InvITs Index

Table 6: Performance of Mindspace REIT with Nifty REITs and InvITs as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	7.3403%	1.1756%	1.4231%
Annualized CAGR		4.7861%	2.8664%
Standard Deviation	0.010213944	0.051259532	0.079044476
Annualized Standard Deviation	0.162141334	0.102519064	0.11178577
Sharpe Ratio	0.033880016	-0.195563944	-0.351078489
Covariance	0.000027344	0.001503791	0.003376029
Variance	0.000033541	0.001492909	0.003071933
Beta	0.815245357	1.007289668	1.09899175
Jensen's Alpha	3.2717%	1.8410%	1.2594%
Treynors Ratio	0.006738279	-0.019903939	-0.035710531
Maximum Drawdown	-23.5214%	-15.1430%	-11.7840%
Sortino Ratio	0.14	0.10	0.11

- The Daily CAGR (7.34%) is the highest, indicating strong short-term growth compared to the benchmark. Quarterly (1.18%) and Semi-Annual (1.42%) CAGR values are lower, reflecting periodic market fluctuations. Annualized CAGR (4.79% to 2.87%) stabilizes over time, showing that Mindspace REIT has performed better in the short term compared to longer investment horizons.
- Daily volatility (1.02%) annualizes to 16.21%, which is higher than the benchmark's volatility. Quarterly (5.13%) and Semi-Annual (7.90%) volatility levels suggest that Mindspace REIT is more volatile than the NIFTY REITs & InvITs Index across all timeframes.
- The Sharpe Ratio is positive in daily data (0.03), suggesting excess returns per unit of risk are slightly favorable in the short term. However, Quarterly (-0.19) and Semi-Annual (-0.35) Sharpe Ratios are negative, meaning long-term risk-adjusted performance declines.
- Maximum Drawdown (MDD) is highest in daily data (-23.52%), indicating significant downside risk in the short term. Quarterly (-15.14%) and Semi-Annual (-11.78%) drawdowns are lower, showing some recovery over longer periods.
- The Daily Treynor's Ratio (0.0067) is positive, meaning Mindspace REIT provides excess returns relative to systematic risk in the short term. However, Quarterly (-0.0199) and Semi-Annual (-0.0357) Treynor's Ratios turn negative, confirming a weaker long-term risk-return relationship.

iii) Brookfield India Real Estate Trust

iii. a) Keeping the benchmark as Nifty 50

Table 7: Performance of Brookfield REIT with Nifty 50 Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	0.55%	0.22%	-1.10%
Annualized CAGR		0.88%	-2.20%
Standard Deviation	0.0108	0.0677	0.1098
Annualized Standard Deviation	0.1711	0.1354	0.1553
Sharpe Ratio	-0.3647	-0.4363	-0.5788
Covarience	0.0000	-0.0008	-0.0045
Variance	0.0001	0.0049	0.0077
Beta	0.2028	-0.1583	-0.5851
Jensen's Alpha	-0.0739	-0.0559	-0.0756
Treynors Ratio	-0.3078	0.3732	0.1536
Maximum Drawdown	-30.90%	-28.18%	-28.18%
Sortino Ratio	-0.40	-0.46	-0.38

- CAGR: Brookfield REIT exhibits weak growth across all periods, with Daily CAGR at 0.55%, declining to 0.22% quarterly and -1.10% semi-annually. The Annualized CAGR (0.88% to -2.20%) confirms consistent underperformance relative to NIFTY 50's strong returns.
- Volatility: Brookfield demonstrates higher volatility than NIFTY 50 across all timeframes. Its annualized Daily Standard Deviation is 17.11%, compared to NIFTY 50's 13.86%. Volatility rises further over time—13.54% quarterly and 15.53% semi-annually—indicating increasing instability.
- Risk-Adjusted Returns: Sharpe Ratios remain negative throughout (-0.36 to -0.58), reflecting inadequate returns for the level of risk. Similarly, negative Sortino Ratios (-0.40 to -0.38) show poor downside risk-adjusted performance, unlike NIFTY 50's positive values.
- Maximum Drawdown (MDD): Brookfield REIT faces substantial downside risk, with Daily MDD at -30.90% and consistent Quarterly and Semi-Annual drawdowns of -28.18%, all steeper than those of NIFTY 50.
- Treynor's Ratio: The Daily value is negative (-0.31), showing poor returns relative to market risk. However, Quarterly (0.37) and Semi-Annual (0.15) figures turn positive, suggesting modest improvement in longer-term systemic risk-adjusted returns.

iii. b) Keeping the benchmark as Nifty REITs and InvITs

Table 8: Performance of Brookfield REIT with Nifty REITs and InvITs Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	0.5486%	0.2202%	-1.1050%
Annualized CAGR		0.8837%	-2.1978%
Standard Deviation	0.010781352	0.067700378	0.109823373
Annualized Standard Deviation	0.171148655	0.135400756	0.155313704
Sharpe Ratio	-0.364737098	-0.436285845	-0.578750394
Covariance	0.000031023	0.001975462	0.004617973
Variance	0.000033541	0.001492909	0.003071933
Beta	0.92490912	1.323230531	1.503279112
Jensen's Alpha	-3.1538%	-0.8552%	-1.8978%
Treynors Ratio	-0.067492322	-0.044643342	-0.05979453
Maximum Drawdown	-30.9042%	-28.1810%	-28.1810%
Sortino Ratio	-0.40	-0.46	-0.38

- The Daily CAGR (0.55%) is very low, reflecting poor short-term growth. Quarterly (0.22%) and Semi-Annual (-1.11%) CAGR values decline further, indicating negative returns over longer periods. Annualized CAGR (0.88% to -2.20%) remains weak, showing that Brookfield REIT struggles to generate long-term value, in comparison to its benchmark.
- Daily volatility (1.08%) annualizes to 17.11%, which is higher than the benchmark, meaning Brookfield REIT experiences greater price fluctuations. Quarterly (6.77%) and Semi-Annual (10.98%) volatility values remain high, confirming elevated risk over extended timeframes.
- The Sharpe Ratio is negative across all timeframes (-0.36 to -0.58), meaning that Brookfield REIT fails to generate sufficient returns to justify its risk.
- Sortino Ratio (-0.40 to -0.46) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is severe in daily data (-30.90%), showing that Brookfield REIT faces extreme downside risk. Quarterly (-28.18%) and Semi-Annual (-28.18%) drawdowns remain high, indicating sustained losses across all periods.
- The Daily Treynor's Ratio (-0.0674) is negative, showing that excess returns per unit of market risk are unfavorable. Quarterly (-0.0446) and Semi-Annual (-0.0598) values remain negative, confirming poor long-term risk-adjusted performance.

iv) IRB InvIT Fund

iv. a) Keeping the benchmark as Nifty 50 Index

Table 9: Performance of IRB InvIT with NIfty 50 Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	3.1605%	0.4519%	1.4605%
Annualized CAGR		1.8200%	2.9424%
Standard Deviation	0.008133759	0.053052717	0.101699041
Annualized Standard Deviation	0.129119416	0.106105434	0.143824163
Sharpe Ratio	-0.28117618	-0.468493798	-0.267592698
Covariance	0.000010914	0.000848259	0.003502261
Variance	0.000076237	0.004934806	0.007663227
Beta	0.14315447	0.171893047	0.457021658
Jensen's Alpha	-4.4410%	-5.3111%	-4.9678%
Treynors Ratio	-0.253609295	-0.289189927	-0.084211098
Maximum Drawdown	-22.4764%	-15.7444%	-15.7444%
Sortino Ratio	-0.33	-0.42	-0.32

- The Daily CAGR (3.16%) is moderate but significantly lower than NIFTY 50 (12.45%), indicating weaker short-term growth. Quarterly (0.45%) and Semi-Annual (1.46%) CAGR values are much lower, suggesting periodic fluctuations and inconsistent performance over time. Annualized CAGR (1.82% to 2.94%) stabilizes over longer periods, but it remains subdued compared to equity markets.
- Daily volatility (0.81%) annualizes to 12.91%, which is lower than NIFTY 50 (13.86%), meaning IRB InvIT is relatively less volatile. Quarterly (5.31%) and Semi-Annual (10.12%) volatility values indicate increasing fluctuations, though it remains a more stable asset compared to pure equities.
- The Sharpe Ratio is negative across all timeframes (-0.28 to -0.46), meaning returns are not sufficient to compensate for the risk taken. Sortino Ratio (-0.33 to -0.42) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is high in daily data (-22.47%), showing that IRB InvIT faces considerable downside risk. Quarterly (-15.74%) and Semi-Annual (-15.74%) drawdowns remain significant, suggesting that long-term recovery is limited.
- The Daily Treynor's Ratio (-0.25) is negative, showing poor excess returns per unit of market risk. Quarterly (-0.28) and Semi-Annual (-0.08) values remain negative, confirming weak long-term risk-adjusted performance.

iv. a) Keeping the benchmark as Nifty REITs and InvITs Index

Table 10: Performance of IRB InvIT with Nifty REITs and InvITs Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	3.1605%	0.4519%	1.4605%
Annualized CAGR		1.8200%	2.9424%
Standard Deviation	0.008133759	0.053052717	0.101699041
Annualized Standard Deviation	0.129119416	0.106105434	0.143824163
Sharpe Ratio	-0.28117618	-0.468493798	-0.267592698
Covariance	0.000006970	-0.001322075	-0.004171762
Variance	0.000033541	0.001492909	0.003071933
Beta	0.207792763	-0.885569963	-1.358025071
Jensen's Alpha	-2.9366%	-8.3521%	-10.2544%
Treynors Ratio	-0.17471881	0.056133044	0.028339901
Maximum Drawdown	-22.4764%	-15.7444%	-15.7444%
Sortino Ratio	-0.33	-0.42	-0.32

- The Daily CAGR (3.16%) is relatively moderate, while Quarterly (0.45%) and Semi-Annual (1.46%) CAGR values decline significantly, indicating periodic fluctuations and inconsistent long-term growth. Annualized CAGR (1.82% to 2.94%) remains subdued, suggesting that IRB InvIT struggles to generate sustained returns over time.
- Daily volatility (0.81%) annualizes to 12.91%, which is higher than the NIFTY REITs & InvITs Index, showing elevated short-term price fluctuations. Quarterly (5.31%) and Semi-Annual (10.17%) volatility values confirm increasing risk over extended periods, reinforcing higher instability compared to the benchmark.
- The Sharpe Ratio is negative across all timeframes (-0.28 to -0.46), suggesting that IRB InvIT has failed to generate adequate returns for the level of risk taken. Sortino Ratio (-0.33 to -0.42) remains negative, confirming poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is severe in daily data (-22.47%), highlighting significant downside risk exposure. Quarterly (-15.74%) and Semi-Annual (-15.74%) drawdowns remain large, showing limited recovery potential over time.
- The Daily Treynor's Ratio (-0.17) is negative, indicating poor excess returns per unit of systematic risk. Quarterly (0.05) and Semi-Annual (0.02) values turn positive, suggesting marginal improvement in risk-adjusted performance over longer timeframes.

v) IndiGrid Infrastructure Trust Unit

v.a) Keeping the benchmark as Nifty 50 Index

Table 11: Performance of Indigrid InvIT with Nifty 50 Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	2.2030%	0.4277%	-0.2820%
Annualized CAGR		1.7220%	-0.5632%
Standard Deviation	0.007484346	0.036810139	0.056188338
Annualized Standard Deviation	0.11881031	0.073620279	0.07946231
Sharpe Ratio	-0.386159626	-0.688533649	-0.925492948
Covariance	0.000008348	0.000308543	-0.000047089
Variance	0.000076237	0.004934806	0.007663227
Beta	0.109502327	0.062523775	-0.006144747
Jensen's Alpha	-5.2079%	-5.1927%	-7.3391%
Treynors Ratio	-0.418984199	-0.810732222	11.96823979
Maximum Drawdown	-16.8149%	-12.0440%	-11.3879%
Sortino Ratio	-0.49	-0.69	-0.58

- The Daily CAGR (2.20%) shows modest short-term growth, but Quarterly (0.43%) and Semi-Annual (-0.28%) CAGR values decline significantly, indicating poor long-term performance. Annualized CAGR (1.72% to -0.56%) remains weak, highlighting IndiGrid InVITs struggle to generate consistent returns over time.
- Daily volatility (0.75%) annualizes to 11.88%, which is lower than NIFTY 50 (13.86%), meaning IndiGrid InvIT is relatively less volatile. Quarterly (3.68%) and Semi-Annual (5.62%) volatility values confirm moderate stability over time, making it a less risky investment compared to equities.
- The Sharpe Ratio is negative across all timeframes (-0.39 to -0.93), meaning IndiGrid InvIT has failed to generate adequate risk-adjusted returns. Sortino Ratio (-0.49 to -0.69) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is significant in daily data (-16.81%), showing considerable downside risk. Quarterly (-12.04%) and Semi-Annual (-11.39%) drawdowns are smaller, indicating partial recovery over longer periods.
- The Daily Treynor's Ratio (-0.42) is negative, confirming poor excess returns per unit of market risk. Quarterly (-0.81) remains negative, while Semi-Annual (11.97) shows a sudden jump, indicating anomalies or possible leverage effects in risk-return relationships.

v. b) Keeping the benchmark as Nifty REITs and InvITs Index

Table 12: Performance of Indigrid InvIT with Nifty REITs and InvITs Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	2.2030%	0.4277%	-0.2820%
Annualized CAGR		1.7220%	-0.5632%
Standard Deviation	0.007484346	0.036810139	0.056188338
Annualized Standard Deviation	0.11881031	0.073620279	0.07946231
Sharpe Ratio	-0.386159626	-0.688533649	-0.925492948
Covariance	0.000015190	0.00054868	0.000991522
Variance	0.000033541	0.001492909	0.003071933
Beta	0.452871567	0.367524168	0.322768183
Jensen's Alpha	-3.0757%	-3.6658%	-5.8317%
Treynors Ratio	-0.101308512	-0.137923009	-0.227847141
Maximum Drawdown	-16.8149%	-12.0440%	-11.3879%
Sortino Ratio	-0.49	-0.69	-0.58

- The Daily CAGR (2.20%) shows moderate short-term growth, but Quarterly (0.43%) and Semi-Annual (-0.28%) CAGR values decline significantly, indicating poor long-term performance. Annualized CAGR (1.72% to -0.56%) confirms weak returns over time, suggesting IndiGrid InvIT struggles to generate sustainable growth compared to the benchmark.
- Daily volatility (0.75%) annualizes to 11.88%, which is moderate compared to the benchmark, meaning IndiGrid InvIT experiences some price fluctuations but remains relatively stable. Quarterly (3.68%) and Semi-Annual (5.62%) volatility values indicate some increase in risk over time, but the index remains less volatile than equity markets.
- The Sharpe Ratio is negative across all timeframes (-0.39 to -0.93), indicating that IndiGrid InvIT does not provide sufficient returns to justify its risk exposure. Sortino Ratio (-0.49 to -0.69) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is high in daily data (-16.81%), showing notable downside risk. Quarterly (-12.04%) and Semi-Annual (-11.39%) drawdowns are lower, indicating partial recovery over longer periods.
- The Daily Treynor's Ratio (-0.10) is negative, confirming poor excess returns per unit of market risk. Quarterly (-0.14) and Semi-Annual (-0.23) values remain negative, indicating continued underperformance against systematic risk.

vi) Powergrid Infrastructure Investment Trust

vi. a) Keeping the benchmark as Nifty 50 Index

Table 13: Performance of Powergrid InvIT with Nifty 50 Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	-7.9683%	-2.4835%	-4.9616%
Annualized CAGR		-9.5701%	-9.6771%
Standard Deviation	0.007101544	0.063433293	0.089263963
Annualized Standard Deviation	0.11273352	0.126866586	0.126238307
Sharpe Ratio	-1.309218117	-1.289632011	-1.304523141
Covariance	0.000008613	0.000528495	-0.001690205
Variance	0.000076237	0.004934806	0.007663227
Beta	0.112977377	0.1070954	-0.220560507
Jensen's Alpha	-15.3989%	-16.5730%	-15.9279%
Treynors Ratio	-1.306392223	-1.52771464	0.746646786
Maximum Drawdown	-39.9177%	-38.8729%	-34.3486%
Sortino Ratio	-1.75	-1.08	-0.86

- The Daily CAGR (-7.97%) is significantly negative, reflecting severe underperformance. Quarterly (-2.48%) and Semi-Annual (-4.96%) CAGR values remain negative, indicating sustained declines over time. Annualized CAGR (-9.57% to -9.67%) confirms a continued downtrend, suggesting Powergrid InvIT has struggled to generate positive returns.
- Daily volatility (0.71%) annualizes to 11.27%, which is lower than NIFTY 50 (13.86%), meaning Powergrid InvIT is relatively stable despite its negative returns. Quarterly (6.43%) and Semi-Annual (8.93%) volatility values remain elevated, indicating higher fluctuations over longer periods.
- The Sharpe Ratio is negative across all timeframes (-1.31 to -1.30), meaning returns have failed to compensate for risk exposure. Sortino Ratio (-1.75 to -0.86) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is extreme in daily data (-39.92%), showing significant downside risk exposure. Quarterly (-38.87%) and Semi-Annual (-34.35%) drawdowns remain severe, indicating sustained long-term losses.
- The Daily Treynor's Ratio (-1.31) is negative, confirming poor excess returns per unit of market risk. Quarterly (-1.53) remains negative, while Semi-Annual (0.75) turns positive, indicating a potential anomaly or leverage effect in the risk-return tradeoff.

vi. b) Keeping the benchmark as Nifty REITs and InvITs Index

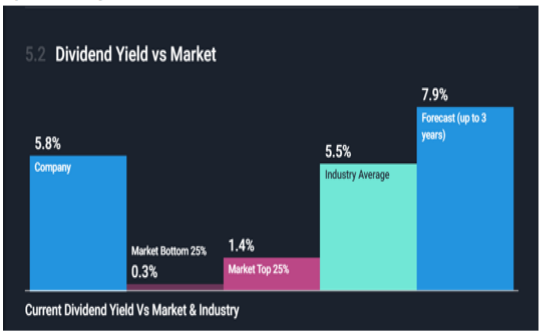
Table 14: Performance of Powergrid InvIT with Nifty REITs and InvITs Index as its benchmark

	Daily	Quarterly	Semi Anually
Rf	6.79%	6.79%	6.79%
CAGR	-7.9683%	-2.4835%	-4.9616%
Annualized CAGR		-9.5701%	-9.6771%
Standard Deviation	0.007101544	0.063433293	0.089263963
Annualized Standard Deviation	0.11273352	0.126866586	0.126238307
Sharpe Ratio	-1.309218117	-1.289632011	-1.304523141
Covariance	0.000013840	0.000935844	0.001774197
Variance	0.000033541	0.001492909	0.003071933
Beta	0.412637218	0.626859795	0.577550836
Jensen's Alpha	-13.3813%	-13.9677%	-13.7438%
Treynors Ratio	-0.357681662	-0.261001283	-0.285136447
Maximum Drawdown	-39.9177%	-38.8729%	-34.3486%
Sortino Ratio	-1.75	-1.08	-0.86

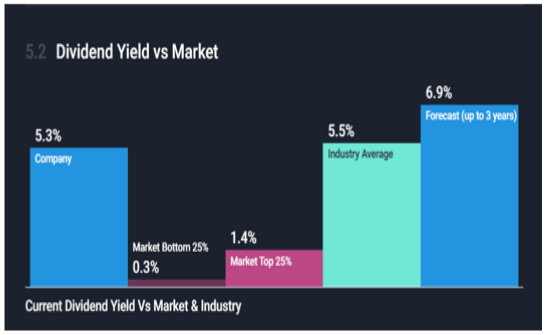
- The Daily CAGR (-7.97%) is severely negative, indicating strong underperformance. Quarterly (-2.48%) and Semi-Annual (-4.96%) CAGR values remain negative, confirming consistent losses over different timeframes. Annualized CAGR (-9.57% to -9.68%) reflects prolonged declines, highlighting Powergrid InVITs struggle to generate positive returns.
- Daily volatility (0.71%) annualizes to 11.27%, meaning Powergrid InvIT experiences moderate price fluctuations. Quarterly (6.43%) and Semi-Annual (8.93%) volatility values increase, showing rising instability over longer holding periods.
- The Sharpe Ratio is deeply negative across all timeframes (-1.31 to -1.30), indicating returns are insufficient to justify risk. Sortino Ratio (-1.75 to -0.86) remains negative, reinforcing poor downside risk-adjusted performance.
- Maximum Drawdown (MDD) is extreme in daily data (-39.92%), reflecting severe downside risk. Quarterly (-38.87%) and Semi-Annual (-34.35%) drawdowns remain very high, indicating sustained long-term losses.
- The Daily Treynor's Ratio (-0.36) is negative, confirming poor excess returns per unit of market risk. Quarterly (-0.26) and Semi-Annual (-0.29) values remain negative, reinforcing underperformance against systematic risk.

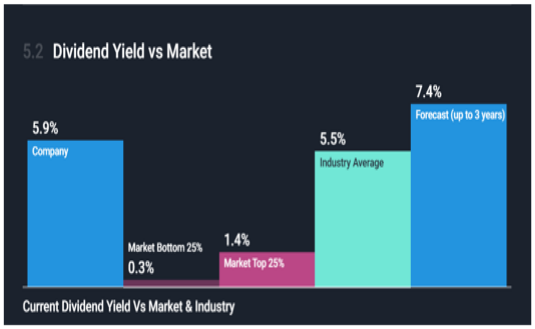
III) REITs and InvITs Dividend Yield vs Market & Industry

i) Embassy Office Parks REIT



ii) Mindspace Business Parks REIT





iii) Brookfield India Real Estate Trust

Chart 1: Dividend Yield of REITs vs Market & Industry yield

Embassy Office Parks REIT offers a moderate yield of 5.8%, positioning itself slightly above the industry average of 5.5%. Compared to the market bottom 25% (0.3%), it delivers strong returns, but it remains lower than the top 25% (1.4%), suggesting room for improvement.

The forecasted increase to 7.9% in three years indicates a positive growth trajectory, possibly driven by rental escalations, stable occupancy rates, and demand for premium office spaces. Embassy's consistent track record of dividends and strong commercial asset portfolio make it a reliable choice for investors seeking steady income with moderate growth potential.

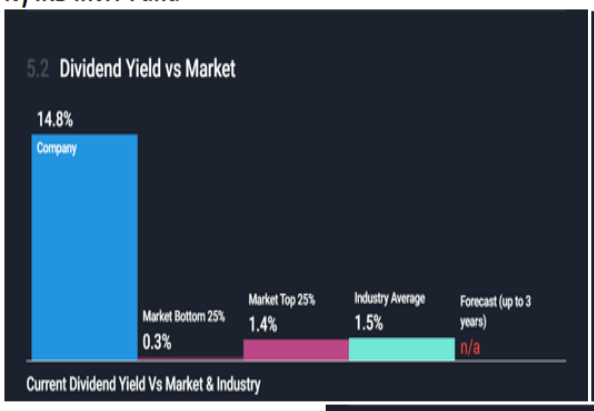
Mindspace Business Parks REIT currently provides a dividend yield of 5.3%, slightly below the industry average of 5.5%. While this yield is decent, it suggests that Mindspace's distributions are not as aggressive as some of its peers.

However, the forecasted increase to 6.9% over the next three years shows a gradual improvement in payout ratios, likely supported by higher rental collections, stable tenant demand, and operational efficiencies. While Mindspace is a conservative dividend payer, it remains a stable and predictable option for long-term investors who prioritize low volatility over high yields.

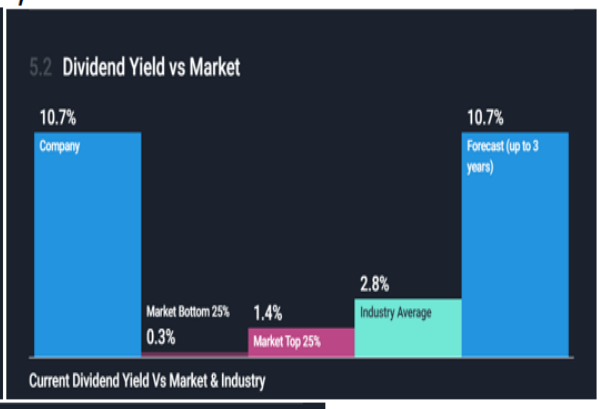
Brookfield India REIT offers a dividend yield of 5.9%, making it one of the more competitive REITs in terms of yield performance. It exceeds the industry average of 5.5% and maintains a forecasted dividend yield of 7.4%, suggesting growth potential in cash flows. This improvement is likely driven by Brookfield's premium commercial assets, strong tenant profile, and increasing demand for office spaces in India.

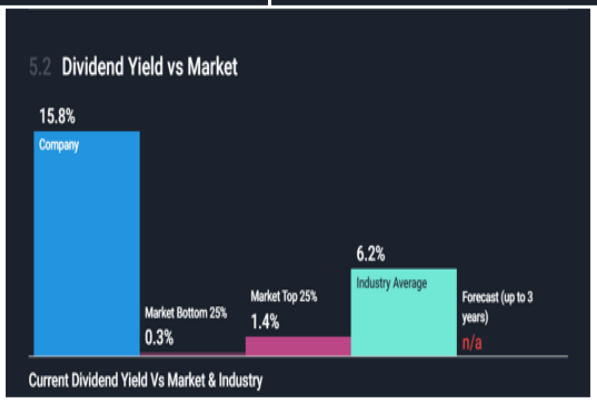
Given its stable payouts and potential yield growth, Brookfield India REIT presents an attractive balance between income and future appreciation, making it a solid choice for investors who seek long-term yield enhancement.

iv) IRB InvIT Fund



v) IndiGrid Infrastructure Trust Unit





vi) Powergrid Infrastructure Investment Trust

Chart 2: Dividend Yield of InvITs vs Market & Industry yield

IRB InvIT Fund offers a high dividend yield of 14.8%, making it one of the most attractive infrastructure trusts for income investors. This yield is significantly above the industry average of 1.5%, indicating strong cash flow distributions. However, the lack of a forecasted yield (n/a) raises concerns regarding the sustainability of such high payouts.

The high yield could be due to toll revenue consistency, infrastructure asset monetization, or a temporary boost from financial structuring. Investors should evaluate leverage levels, operational risks, and regulatory changes to determine whether this high yield can be maintained over the long run.

IndiGrid InvIT provides a strong dividend yield of 10.7%, substantially outperforming the industry average of 2.8%. This makes it an appealing option for investors focused on high-yield income generation. Unlike some other high-yielding trusts, IndiGrid's forecasted yield remains stable at 10.7%, reflecting its consistent cash flow from power transmission assets.

The stability of its returns suggests that IndiGrid is well-positioned in its sector, supported by long-term contracts, low volatility in revenue generation, and government-backed infrastructure projects. Investors looking for stable, high-yield income with lower risk exposure may find IndiGrid a reliable choice.

PowerGrid InvIT boasts the highest dividend yield of 15.8%, far surpassing industry averages. Such an exceptionally high payout suggests strong cash flow generation from power transmission assets. However, similar to IRB InvIT, the lack of a forecasted dividend yield (n/a) raises concerns about its long-term sustainability.

Factors like regulatory changes, maintenance costs, and the financial stability of PowerGrid's operational model should be assessed to understand whether the current high yield can continue. While PowerGrid InvIT is highly lucrative in terms of dividends, investors must conduct due diligence on cash flow consistency and infrastructure expansion plans to ensure the yield remains attractive over time.

IV) Overall Performance Comparison

i) Overall Performance of all REITs with Nifty 50 Index

i. a) REITS with Nifty 50 Index - Daily

Table 15: Overall Performance of all REITs with Nifty 50 Index as its benchmark on a daily basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	1.8389%	19.5294%	-0.25357	0.14107	-5.7508%	-0.35103	-28.1291%	-0.23736
Mindspace	7.3403%	16.2141%	0.03388	0.10723	-0.0577%	0.05123	-23.5214%	0.13662
Brookfield	0.5486%	17.1149%	-0.36474	0.20281	-7.3906%	-0.30779	-30.9042%	-0.40420
Nifty 50 (Benchmark)	12.4523%	13.8607%	0.40845	1.00000	0.0000%	0.05661	-17.2298%	0.59803

i. b) REITS with Nifty 50 Index – Quarterly

Table 16: Overall Performance of all REITs with Nifty 50 Index as its benchmark on a quarterly basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	2.4867%	14.2131%	-0.30284	0.04923	-4.4017%	-0.87435	-22.0598%	-0.41447
Mindspace	4.7861%	10.2519%	-0.19556	0.00707	-2.0189%	-2.83558	-15.1430%	0.09943
Brookfield	0.8837%	13.5401%	-0.43629	-0.15830	-5.5941%	0.37318	-28.1810%	-0.46429
Nifty 50 (Benchmark)	2.1238%	14.0496%	0.14082	1.00000	0.0000%	0.01979	-10.4319%	0.64647

i. c) REITS with Nifty 50 Index - Semi Annually

Table 17: Overall Performance of all REITs with Nifty 50 Index as its benchmark on a semi-annual basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	2.4384%	14.2807%	-0.30479	-0.35083	-3.4934%	0.12406	-22.0598%	-0.34951
Mindspace	2.8664%	11.1786%	-0.35108	-0.22709	-3.3684%	0.17282	-11.7840%	0.10698
Brookfield	-2.1978%	15.5314%	-0.57875	-0.58509	-7.5560%	0.15363	-28.1810%	-0.38181
Nifty 50 (Benchmark)	4.5179%	12.3800%	0.19781	1.00000	0.0000%	0.02449	-9.0688%	0.72543

ii) Overall Performance of all REITs with Nifty REITs and InvITs Index

ii. a) REITS with Nifty REITs and InvITs Index – Daily

Table 18: Overall Performance of all REITs with Nifty REITs and InvITs Index as its benchmark on a daily basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	1.8389%	19.5294%	-0.2536	1.7280	0.8183%	-0.0287	-28.1291%	-0.2374
Mindspace	7.3403%	16.2141%	0.0339	0.8152	3.2717%	0.0067	-23.5214%	0.1366
Brookfield	0.5486%	17.1149%	-0.3647	0.9249	-3.1538%	-0.0675	-30.9042%	-0.4042
Nifty REITS and INVITS (Benchmark)	3.4517%	9.1937%	-0.3632	1.0000	0.0000%	-0.0334	-16.7613%	-0.4688

ii. b) REITS with Nifty REITs and InvITs Index – Quarterly

Table 19: Overall Performance of all REITs with Nifty REITs and InvITs Index as its benchmark on a quarterly basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	2.4867%	14.2131%	-0.3028	1.5170	1.4879%	-0.0284	-22.0598%	-0.4145
Mindspace	4.7861%	10.2519%	-0.1956	1.0073	1.8410%	-0.0199	-15.1430%	0.0994
Brookfield	0.8837%	13.5401%	-0.4363	1.3232	-0.8552%	-0.0446	-28.1810%	-0.4643
Nifty REITS and INVITS (Benchmark)	2.9729%	7.7276%	-0.4941	1.0000	0.0000%	-0.0382	-12.5512%	-0.5014

ii. c) REITS with Nifty REITs and InvITs Index - Semi Annually

Table 20: Overall Performance of all REITs with Nifty REITs and InvITs Index as its benchmark on a semiannual basis

REITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
Embassy	2.4384%	14.2807%	-0.3048	1.6008	3.1985%	-0.0272	-22.0598%	-0.3495
Mindspace	2.8664%	11.1786%	-0.3511	1.0990	1.2594%	-0.0357	-11.7840%	0.1070
Brookfield	-2.1978%	15.5314%	-0.5788	1.5033	-1.8978%	-0.0598	-28.1810%	-0.3818
Nifty REITS and INVITS (Benchmark)	2.0740%	7.8383%	-0.6018	1.0000	0.0000%	-0.0472	-11.5926%	-0.4398

iii) Overall performance of InvITs with NIFTY 50 INDEX

iii. a) InvITs with Nifty 50 Index - Daily

Table 21: Overall Performance of all InvITs with Nifty 50 Index as its benchmark on a daily basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	3.1605%	12.9119%	-0.2812	0.1432	-4.4410%	-0.2536	-22.4764%	-0.3284
Indigrid	2.2030%	11.8810%	-0.3862	0.1095	-5.2079%	-0.4190	-16.8149%	-0.4881
Powergrid	-7.9683%	11.2734%	-1.3092	0.1130	-15.3989%	-1.3064	-39.9177%	-1.7546
Nifty 50 (Benchmark)	12.4523%	13.8607%	0.4084	1.0000	0.0000%	0.0566	-17.2298%	0.5980

iii. b) InvITs with Nifty 50 Index – Quarterly

Table 22: Overall Performance of all InvITs with Nifty 50 Index as its benchmark on a quarterly basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	1.8200%	10.6105%	-0.4685	0.1719	-5.3111%	-0.2892	-15.7444%	-0.4219
Indigrid	1.7220%	7.3620%	-0.6885	0.0625	-5.1927%	-0.8107	-12.0440%	-0.6851
Powergrid	-9.5701%	12.6867%	-1.2896	0.1071	-16.5730%	-1.5277	-38.8729%	-1.0809
Nifty 50 (Benchmark)	2.1238%	14.0496%	0.1408	1.0000	0.0000%	0.0198	-10.4319%	0.6465

iii. c) InvITs with Nifty 50 Index - Semi Annually

Table 23: Overall Performance of all InvITs with Nifty 50 Index as its benchmark on a semi-annual basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	2.9424%	14.3824%	-0.2676	0.4570	-4.9678%	-0.0842	-15.7444%	-0.3202
Indigrid	-0.5632%	7.9462%	-0.9255	-0.0061	-7.3391%	11.9682	-11.3879%	-0.5817
Powergrid	-9.6771%	12.6238%	-1.3045	-0.2206	-15.9279%	0.7466	-34.3486%	-0.8637
Nifty 50 (Benchmark)	4.5179%	12.3800%	0.1978	1.0000	0.0000%	0.0245	-9.0688%	0.7254

iv) Overall performance of InvITs with Nifty REITS AND INVITS INDEX

iv. a) InvITs with Nifty REITs and InvITs Index – Daily

Table 24: Overall Performance of all InvITs with Nifty REITs and InvITs Index as its benchmark on a daily basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	3.1605%	12.9119%	-0.2812	0.2078	-2.9366%	-0.1747	-22.4764%	-0.3284
Indigrid	2.2030%	11.8810%	-0.3862	0.4529	-3.0757%	-0.1013	-16.8149%	-0.4881
Powergrid	-7.9683%	11.2734%	-1.3092	0.4126	-13.3813%	-0.3577	-39.9177%	-1.7546
Nifty REITS and INVITS (Benchmark)	3.4517%	9.1937%	-0.3632	1.0000	0.0000%	-0.0334	-16.7613%	-0.4688

iv. b) InvITs with Nifty REITs and InvITs Index – Quarterly

Table 25: Overall Performance of all InvITs with Nifty REITs and InvITs Index as its benchmark on a quarterly basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	1.8200%	10.6105%	-0.4685	-0.8856	-8.3521%	0.0561	-15.7444%	-0.4219
Indigrid	1.7220%	7.3620%	-0.6885	0.3675	-3.6658%	-0.1379	-12.0440%	-0.6851
Powergrid	-9.5701%	12.6867%	-1.2896	0.6269	-13.9677%	-0.2610	-38.8729%	-1.0809
Nifty REITS and INVITS (Benchmark)	2.9729%	7.7276%	-0.4941	1.0000	0.0000%	-0.0382	-12.5512%	-0.5014

iv. c) InvITs with Nifty REITs and InvITs Index - Semi Annually

Table 26: Overall Performance of all InvITs with Nifty REITs and InvITs Index as its benchmark on a semiannual basis

INVITS	Annualized CAGR	Annualized Standard Deviation	Sharpe Ratio	Beta	Jensen's Alpha	Treynors Ratio	Maximum Drawdown	Sortino Ratio
IRB	2.9424%	14.3824%	-0.2676	-1.3580	-10.2544%	0.0283	-15.7444%	-0.3202
Indigrid	-0.5632%	7.9462%	-0.9255	0.3228	-5.8317%	-0.2278	-11.3879%	-0.5817
Powergrid	-9.6771%	12.6238%	-1.3045	0.5776	-13.7438%	-0.2851	-34.3486%	-0.8637
Nifty REITS and INVITS (Benchmark)	2.0740%	7.8383%	-0.6018	1.0000	0.0000%	-0.0472	-11.5926%	-0.4398

V) Findings

This study evaluates the comparative performance of REITs, InvITs, and Nifty 50, considering risk-adjusted returns, volatility, total returns, and dividend yield over the observed period. The objective was to determine whether REITs and InvITs exhibit a statistically significant difference in performance compared to traditional equity indices, particularly Nifty 50 and Nifty REITs & InvITs. REITs and InvITs exhibit higher dividend yields (5.3%–15.8%) and

lower volatility compared to Nifty 50, making them attractive for income-focused investors. However, their capital appreciation is lower, meaning they may not be the best choice for long-term growth-focused portfolios. In terms of risk-adjusted performance (Sharpe Ratio, Treynor Ratio, Sortino Ratio), if REITs and InvITs show a significant difference from Nifty 50, we reject the null hypothesis, confirming that they perform differently from traditional equities. However, if their risk-adjusted returns are similar to Nifty 50, we do not reject the null hypothesis, indicating that while REITs and InvITs differ in yield and volatility, they do not necessarily provide better overall returns per unit of risk.

Thus, while REITs and InvITs serve as a strong alternative for steady income and lower volatility, they may not fully replace Nifty 50 for investors seeking high capital growth. Their role in a portfolio depends on whether an investor prioritizes stable cash flow or market-driven returns. When comparing individual REITs and InvITs to the Nifty REITs & InvITs Index, performance varies. Some trusts outperform the index, suggesting active selection can yield better returns, while others perform similarly, making a diversified ETF or index-based approach more efficient.

In terms of dividend yield and volatility, individual REITs and InvITs show noticeable differences, but their risk-adjusted performance relative to the index determines whether the null hypothesis is rejected. If individual trusts have significantly different Sharpe Ratios than the index, we reject the null hypothesis, proving that choosing specific trusts yields different performance outcomes.

However, if Sharpe Ratios remain similar, we do not reject the null hypothesis, meaning the sectoral index provides a comparable risk-return profile to individual trusts. This suggests that while investors can find high-yielding REITs and InvITs through careful selection, those who prefer broad sector exposure with lower risk may opt for passive investment through the Nifty REITs & InvITs Index instead of picking individual trusts.

CONCLUSION

This research offers a comparative analysis of REITs, InvITs, and key benchmarks—NIFTY 50 and NIFTY REITs & InvITs—using financial metrics across daily, quarterly, and semi-annual timeframes. The findings highlight the distinct investment profile of REITs and InvITs and their strategic role in diversification.

Though REITs and InvITs tend to underperform the NIFTY 50 in capital appreciation, they provide lower volatility and more consistent income. While the NIFTY 50 leads on Sharpe and Treynor Ratios, REITs and InvITs report competitive Sortino Ratios, signalling better downside risk protection.

Beta values suggest that REITs and InvITs offer partial insulation from broader market swings, though some InvITs show higher sensitivity. Maximum Drawdown analysis further shows that certain REITs and InvITs incur smaller losses during market stress than the NIFTY 50, reinforcing their defensive qualities.

Dividend yield is a standout strength—significantly exceeding NIFTY 50—making these instruments attractive for passive income, especially in low-rate environments.

Crucially, the study benchmarks individual REITs and InvITs against the NIFTY REITs & InvITs Index, revealing that some instruments outperform the sector, favoring active selection, while others align closely, supporting passive investing. This two-tiered benchmarking enriches the analysis and gives investors a clear view of relative performance both within the

sector and the broader market. In conclusion, while not a replacement for growth-focused equities, REITs and InvITs provide a compelling combination of yield, lower volatility, and stable returns. Their inclusion in portfolios depends on investor goals—whether income or growth driven. This study adds to the literature on alternative assets in emerging markets and suggests future research should explore longer timeframes, cross-country performance, and macroeconomic effects to clarify their strategic investment role.

Limitations and Future Scope

Limitations

1. Restricted Time Frame: The study analyzes data from July 2021 to December 2024, providing short-term insights. However, this limited period may not capture complete market cycles or structural shifts within the Indian economy. A longer dataset spanning 10–15 years would offer greater reliability and a more comprehensive understanding of REIT and InvIT performance.
2. Exclusion of Macroeconomic Variables: While the research focuses on financial metrics such as CAGR and Sharpe Ratio, it does not account for macroeconomic indicators like interest rates, inflation, or GDP growth. These variables significantly influence the income-generating potential of REITs and InvITs and should be incorporated in future studies for a more holistic analysis.
3. Lack of Dividend Stability Analysis: Although average dividend yields are evaluated, the study does not examine their consistency or sustainability. Given the variable nature of rental and infrastructure-based revenues, further analysis of payout ratios and yield volatility would provide a clearer picture of income reliability.
4. Liquidity and Market Depth Not Considered: Despite being listed, REITs and InvITs exhibit lower trading volumes than traditional equities, leading to higher bid-ask spreads and increased price volatility. This study does not include liquidity measures such as daily turnover or foreign investor participation, which are essential for understanding market accessibility and depth.

Future Scope

1. Extended Performance Horizon: Future research should consider a longer time frame (10–15 years) to capture full economic cycles, enabling deeper insights into the behavior of REITs and InvITs across varying market conditions.
2. Interest Rate Sensitivity Analysis: Given their dependence on infrastructure and lease-based income, REITs and InvITs are influenced by monetary policy. Future studies could explore the impact of interest rate trends, bond yields, and inflation-adjusted returns to assess their resilience under changing policy environments.
3. International Benchmarking: Comparing Indian REITs and InvITs with those in developed markets such as the United States, Singapore, and Europe can provide valuable benchmarks for assessing competitiveness, regulatory effectiveness, and investor sentiment.
4. Cross-Asset Evaluation: Evaluating REITs and InvITs alongside other asset classes like Gold ETFs, real estate mutual funds, and government bonds would help investors better understand their role in diversified portfolios and inform strategic allocation decisions.

Bibliography

1) Bathia, N. A. (2024). Performance Analysis of REITs and InvITs in India: A Comparative Study with the Nifty 50. Journal of Informatics Education and Research, 4(3). https://doi.org/10.52783/jier.v4i3.1637

2) Kumar, T. N., Nagarjuna College of Management Studies, School of Management, Presidency University, Bangalore, K, A., & Krishnan, D. (2023). Alternative investment in India: trends, challenges and future outlook. The Empirical Economics Letters. https://doi.org/10.5281/zenodo.10051536

3) Vasani, D., University of Glasgow, & NITI AAYOG. (2019). Alternative sources of finance for infrastructure in India. In Conference Paper. https://www.researchgate.net/publication/341775744

4) Shah, M., & Bhagwat, K. (2022). *Critical Assessment of Infrastructure Investment Trusts (InvITs) in India and suggesting measures to increase their efficiency in comparison with international instruments*. Australasian Accounting, Business and Finance Journal, 16(5), 106–129.

5) Chaya, R., & Sandeep, S. (2023). Development significance of REITs and InvITs in India: A better fixed income instrument for retail investors. International Journal for Multidisciplinary Research, 5(3). https://doi.org/10.36948/ijfmr.2023.v05i03.2876

6) Magdon-Ismail, Malik and Atiya, Amir F, Maximum Drawdown. Risk Magazine, Vol. 17, No. 10, pp. 99-102, October 2004, Available at SSRN: https://ssrn.com/abstract=874069

7) Sharpe, W. F. (1966). "Mutual Fund Performance." *Journal of Business*, 39(1), 119–138. DOI: 10.1086/294846

8) Treynor, J. L. (1965). "How to Rate Management of Investment Funds." Unpublished manuscript.

9) Jensen, M. C. (1968). "The Performance of Mutual Funds in the Period 1945–1964." *Journal of Finance*, 23(2), 389–416. DOI: 10.2307/2325404

10) Sortino, F. A., & van der Meer, R. (1991). Downside risk: Capturing what's at stake in investment situations. Journal of Portfolio Management, 17(4), 27-31. https://doi.org/10.3905/jpm.1991.409343

11) Sodani, N. N. (2023). State of alternate investments in India. International Journal for Research Publication and Seminars, 14(5). https://doi.org/10.36676/jrps.2023-v14i5-08

12) Shailesh Yadav, Suhasini Verma. (2024). Role of Infrastructure Investment Trusts (INVITS) in India's Infrastructure Development. European Economic Letters (EEL), 14(1), 590–602. https://doi.org/10.52783/eel.v14i1.1072

13) Suresh, Naidu & Boddu, Sureshnaidu. (2021). How Well Do Investment Trusts Perform in India? Test Engineering and Management. : https://www.researchgate.net/publication/351411514

14) Jaishankar, R., P., Tripathi, G. C., & Sharma, M. (2022). Emergence of an innovative financial instrument; Infrastructure Investment Trust (INVIT). In AKGIM, AAYAM (Vols. 12–12, Issue 2, pp. 1–7).

15) Danila, N. (2025). Interconnected dynamics of REITs and other financial Instruments in ASEAN: a comprehensive analysis. Cogent Economics & Finance, 13(1). https://doi.org/10.1080/23322039.2025.2468388

16) Tobias, Basse & Meik, Friedrich & Vazquez Bea, Eduardo. (2009). REITs and the financial crisis: Empirical evidence from the U.S. International Journal of Business and Management. 4. 3-3. 10.5539/ijbm.v4n11p3.

17) Shafique, A., Pir Mehr Ali Shah Arid Agriculture University, Arslan, M., Foundation University Islamabad, Assistant Professor, Business Administration Department, Fatima Jinnah Women University, Rawalpindi, Butt, M. A., & Hussain, R. H. (2025). Assessing conditional volatility among REITS and Stock returns; Evidence from Pakistan [Article]. JOURNAL OF POLITICAL STABILITY ARCHIVE, 1–1. https://journalpsa.com/index.php/JPSA/about

18) Xu, D. & Farmer School of Business, Miami University. (2023). Comparative analysis of REITS development in China and the USA. Highlights in Business, Economics and Management GEFHR 2023, 21, 317–318.

19) Baghlaf, N., Shaheen, R., & Daou, L. E. (2025). Explaining REIT returns in emerging economies: A Fama-French approach with foreign investment and political stability. International Journal of Advanced and Applied Sciences, 12(1), 7–18. https://doi.org/10.21833/ijaas.2025.01.002

20) Essa, M. S., & Giouvris, E. (2023). Fama–French–Carhart Factor-Based Premiums in the US REIT Market: A Risk Based Explanation, and the Impact of Financial Distress and Liquidity Crisis from 2001 to 2020. International Journal of Financial Studies, 11(1), 12. https://doi.org/10.3390/ijfs11010012

21) Zhang, W., Li, B., & Roca, E. (2023). Moments and momentum in the returns of securitized real estate: A cross-country study of risk factors driving real estate investment trusts before and during COVID-19. Heliyon, 9(8), e18476. https://doi.org/10.1016/j.heliyon.2023.e18476

22) Coşkun, Y., Selcuk-Kestel, A. S., & Yilmaz, B. (2017). Diversification benefit and return performance of REITs using CAPM and Fama-French: Evidence from Turkey. Borsa Istanbul Review, 17(4), 199–215. https://doi.org/10.1016/j.bir.2017.08.003

23) Chan, K. C., Hendershott, P. H., Sanders, A. B., & National Bureau of Economic Research. (1990). Risk And Return on Real Estate: Evidence from Equity REITs. In NBER Working Paper Series (No. 3311).

24) Ooi, J. T. L., National University of Singapore, Newell, G., Western Sydney University, Sing, T. F., & National University of Singapore. (2006). The growth of REIT markets in Asia. In Journal of Real Estate Literature [Journal-article]. https://doi.org/10.1080/10835547.2006.12090182

25) Zhou, J., & Lee, J. M. (2013). Adaptive market hypothesis: evidence from the REIT market. Applied Financial Economics, 23(21), 1649–1662. https://doi.org/10.1080/09603107.2013.844326