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The Risk-Return Disconnect: A Study on Beta Anomaly in Indian Stock Market

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Abstract

Low-beta stocks tend to outperform high-beta stocks. The association of beta and return has been reported to be reverse in many studies. This study assesses whether that anomaly is found in Indian equity market. Further, it will also assess the direction and strength of beta and return relationship across market-capitalisation segments. This study employs a quantitative profile with a longitudinal design. It uses companies listed in the National Stock Exchange NIFTY 500 index for the period from 1 April 2021 to 31 March 2026. The planned stratified sample has companies divided as follows: four large-cap, six mid-cap and t*en small-cap stocks. *However, the reported small-cap statistical comparison covers seven stocks only, due to the inconsistency in availability of daily data and temporal alignment among the selected stocks. The secondary historical stock-price data are looked at with estimated market beta, descriptive statistics, Pearson and Spearman correlations, beta-sorted portfolios and tests with HAC standard errors. Results show a positive but not statistically significant beta–return correlation in the large-cap and small-cap samples. Although the mid-cap sample is strongly positively correlated, its specific permutation test does not achieve the five percent significance level. The high-beta portfolios tend to outperform the low-beta portfolios in terms of returns on average in the reported large-cap and mid-cap comparisons. However, the return spreads are statistically insignificant in these comparisons. On the whole, the evidence does not document a low-beta anomaly present across the segments. The study indicates that risk pricing is heterogeneous and reveals that beta is of limited use for investors. Generalisation is constrained and future analysis should be consistent and broad as the time periods for observations are unequal. The dividend adjustments are incomplete and the samples used in the analysis are small.

Keywords: Beta Anomaly, Systematic Risk, Risk–Return Relationship, NIFTY 500, Market Capitalisation.

1.INTRODUCTION

Higher risk often means higher return, is this always the case? The above question represents the beta paradox, which questions the risk–return relation in the financial market. As per the Capital Asset Pricing Model (CAPM) prediction of Sharpe (1964), it means higher the beta of an individual, higher will be the expected return of that individual. The fact that low-risk stocks achieve better risk-adjusted performance than high-risk stocks raises questions about the worldwide applicability of the asset pricing model. Ganesh et al. (2019) stated behavioural perspective plays a major role in taking decisions and hence they may perceive the stocks that state high risk and low risk in a different way. It is possible to conduct a comprehensive literature analysis. The study undertaken by Fama and French (1992) states that stock returns show weak relation with beta after controlling for characteristics of the firm. Frazzini, A. and Pedersen, L. H. (2014) show that financial models of the international betting-against-beta effect are manifestations of leverage constraints. Some investors may pay too much for high-beta securities. In a study of risk perceptions of investors Indian financial markets, the study identified judgemental biases among practitioners in their assessment of investment decisions (Ganesh and Naresh, 2016). According to Ali and Badhani (2021), there exists a non-linear association between beta and return. The returns anticipated from the analysis of 650 Indian stocks spanning over 189 months witnessed a continuous fall along with an increase in beta. According

to Saraf and Kayal (2023), the volatility anomaly of Nifty 500 stocks also has significance over longer investment horizons. A study in 2025 by Tulsyan, Joshipura and Mishra finds that profitability moderation produces a very low Indian anomaly. Safeeda and Ganesh (2024) found that there are so many biases that can influence an investor is having variation during stable and turbulent periods and the study also produced ample evidence to show market conditions play an important role in investment behaviour.

However, the big questions remain unanswered. The Indian evidence was recently spread out across various sample periods, risk measures and modelling specifications. In addition, one should not interpret total volatility estimates as indicative of systematic beta. Thus, we need to assess the beta anomaly in the current financial market environment under different market regimes and after controlling for return predictors. Its economic importance further rests on portfolio construction, transaction costs and stability of estimated betas.

The aim of the research is to examine the nature and strength of the relationship between beta and return in the Indian stock market. Moreover, it also examines the performance of low and high-beta portfolios. In addition, it also tests the robustness of such an anomaly under different market regimes and alternative asset-pricing specifications. In this context, rolling beta estimation, portfolio sorts, CAPM and multi-factor regressions as well as Fama–MacBeth cross-sectional tests provide statistical evidence for the estimated risk premiums, alphas, confidence intervals and statistical significance. By distinguishing between statistically significant factor portfolios and investable profitable factor portfolios, the study contributes to the emerging-market asset-pricing literature for better risk management and portfolio allocation.

2.MATERIAL AND METHODS

The study focuses on the Indian stock market, primarily on the firms that are part of the Nifty 500 Index. The research will cover five financial years (1 April 2021 to 31 March 2026) which may be used to observe the relationship between systematic risk and stock returns during the market phases of expansion, correction and volatility. The research design is quantitative, explanatory and longitudinal, and the study is based only on secondary financial data. This research looks at the relationship between monthly stock return and market movement to find out whether higher beta stocks always yield higher returns as asserted in capital asset pricing model (CAPM) or lower beta stocks perform better relatively.

2.1. Research Area and Study Duration.

The study population is represented by the NIFTY 500 Index constituting 500 stocks. The NIFTY500 index consists of twenty different industry groups; hence a sample of 20 stocks is drawn from them. To maintain a representative sample by market capitalisation, the NIFTY 500 is composed of 100 large-cap, 150 mid-cap and 250 small-cap companies.

2.2. Population along with Sampling Design

The sampling design is industry-wise heterogeneous and proportionately stratified by market capitalisation. The analysis for beta behaviour was performed using both classifications over different company sizes.

Capitalisation category	Population	Sample	Sample share
Large-cap	100	4	20%
Mid-cap	150	6	30%
Small-cap	250	10	50%
Total	**500**	**20**	**100%**

It is necessary to determine index membership and classification of companies at the start of the study (not selected a posteriori from the March 2026 constituents). In the final sampling register, identification will be made of all 20 securities, their respective industry and capitalisation categories.

2.3. Sources of Information and Procedures for Obtaining Data.

The study makes use of secondary data which is collected from the market of official finance databases. The Historical prices, corporate actions, trading data and index constituents are all available in the National Stock Exchange of India.

The market benchmark is the NIFTY 500 Total Returns Index (TRI), which accounts for price appreciation and dividend returns. The risk-free rate is the yield on the Reserve Bank of India's 91-day Treasury Bill.

The closing prices for every calendar month's last trading day serve as the monthly observation. The value of a stock may be adjusted over the course of the year as a result of a stock split, bonus issue and other corporate actions. Dividend payments are included in total-return calculations.

To calculate the April 2021 first monthly return, the closing price is also required for the date of March 2021. As a result, the dataset consists of at most 1200 stock-months (20 stocks × 60 months).

To allow for subgroup comparisons and thereby reduce potential classification and selection bias, we record the firm market capitalization, industry classification and historical constituent information.

2.4 Variables and Measurement

Stock return, market return and systematic risk measured through beta are the key variables. Supporting measures include excess return, portfolio return, CAPM alpha, return volatility, and Sharper ratio. The returns covariance of a stock and market returns are calculated against the variance in market return so as to estimate beta. The investigation of beta anomaly uses both absolute and risk-adjusted returns to establish that beta differences are not caused solely by differences in total volatility.

2.5 Statistical and Analytical Procedures

The statistical analysis uses a combination of descriptive statistics, rolling beta estimates, beta-sorted portfolio analyses, CAPM time-series regressions and Fama–MacBeth cross-sectional regressions (Fama & MacBeth, 1973) The summary statistics communicate the distribution of returns and their risk characteristics. To minimize look-ahead bias, we calculate rolling beta estimates on the basis of past weekly observations. Stocks are ranked according to their estimated beta. They are then partitioned into low-beta and high-beta portfolios. At the end, they compare the monthly returns to see if there are any systematic performance differences.

Abnormal portfolio returns are revealed by CAPM regressions. Cross-sectional regressions gauge the significance of beta in relation to stock returns in the data. Other specifications control for differences in market capitalisation. Assessment in terms of regression coefficients, confidence intervals and HAC (Heteroskedasticity-and-Autocorrelation-consistent) standard errors Newey and West (1987).

Low-beta portfolios generate significant positive abnormal returns that are bigger than those from high-beta portfolios when adjusted by the market is the main hypothesis. When estimating beta, I utilize various windows, portfolio-weighting procedures, and market conditions. The combined methodologies aid in identifying the existence, directionality, and importance of beta anomaly in the chosen Indian stocks.

The stock returns are computed after adjusting prices as.

$$\mathbf{R_{i,t} = (P_{i,t} / P_{i,t-1}) - 1}$$

R_{it} represents the return of stock i in the specified period t, while the price P is that same price adjusted for corporate action.

The covariance-variance methodology is used to estimate systemic risk.

$$\mathbf{\beta_i = Cov(R_i, R_m) / Var(R_m)}$$

In which Rm indicates the return on the NIFTY 500 market benchmark. A beta greater than 1 indicates higher volatility than the wider market. If Beta values are lower than one, it shows that it have lower systematic risk.

The rolling beta estimates are calculated from the previous 52 completed weekly observations to avoid look-ahead bias. The first year in the sample is the first estimation window and subsequent monthly returns is the main evaluation window. The main evaluation window runs from April 2022 to March 2026. So, portfolio assignments and asset-pricing tests use information prior to the return period.

2.6. Analytical and statistical methods.

The beta anomaly is analysed through various statistical methods.

2.6.1 To assess the spread of risk and return, the mean returns, standard deviation, minimum, maximum returns, and expected betas are computed. Both Pearson's coefficient and Spearman's Rank correlation are used to measure direction and strength of the association of beta-return.

2.6.2. On each formation date within a month, the twenty chosen stocks will be scored on the basis of beta coefficients assessed earlier and split into five portfolios of identical size (portfolios containing four stocks each). The comparison of non-cumulative monthly returns of the lowest beta and highest portfolios. The portfolio types are updated frequently without future return.

2.6.3 Using the Capital Asset Pricing Model, Jensen's alpha is employed through time-series regressions to ascertain whether or not the portfolio return is greater than what would normally be offered for the systematic risk taken. The Sharpe Ratios further confirm return performance in relation to total risk. This insitution seeks to construct a low-beta-minus-high-beta return spread to see if low-beta securities outperform high-beta securities, after controls for market risk.

2.6.4 To estimate the relationship between lagged beta and future stock returns, cross-sectional regression analysis using Fama and MacBeth (1973) procedures is performed on different monthly observations. The estimated beta risk premium is examined to determine whether systematic risk is positively compensated or exhibits a weak or possibly negative link with actual returns. The market-capitalisation controls are introduced to check size association with current company virtue.

2.6.5 The t-statistics, p-values, and intervals are subject to regression at 5% levels to assess the robustness of the abnormal portfolio returns' statistical significance and the estimates of beta premiums. We use the heteroskedasticity-and autocorrelation-consistent standard errors of Newey and West (1987) to improve inference. Analyses further address the sensitivities to market regimes, variations by capitalisation category, and alternative beta-estimation specifications.

Analysis Procedures

For stronger reproducibility, the following regression models should be specified in the manuscript or its statistical analysis appendix.

1. CAPM regression and Jensen's alpha

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p (R_{m,t} - R_{f,t}) + \varepsilon_{p,t}$$

In this case, α_p, a measure of risk-adjusted abnormal return of the portfolio. A positive and statistically significant alpha for low-beta stocks would support anomaly hypothesis.

2. Low-beta-minus-high-beta portfolio test

$$R_{l,t} - R_{h,t} = \alpha_{LH} + \beta_{LH} (R_{m,t} - R_{f,t}) + \varepsilon_t$$

The main test examines $\alpha LH > 0$. This determines whether the low-beta portfolio outperforms the high-beta portfolio more than would be expected from their market exposures.

3. Fama–MacBeth cross-sectional regression

$$R_{i,t+1} - R_{f,t+1} = \gamma_{0,t+1} + \gamma_{\beta,t} + 1\hat{\beta}_{i,t} + \gamma_{s,t} + 1\ \mathrm{In}(M, C_{i,t}) + \varepsilon_{i,t+1}$$

Averaging the monthly beta premiums refers to the averaging of the monthly beta premiums over the last 60-month evaluation period.

$$\overline{\gamma\beta} = \frac{1}{60} \sum = \gamma\beta, t$$

A measure of the average value of beta being found statistically significantly negative provides further proof of an inverse of beta and return relationship. The inference can use Newey–West standard errors with a lag of three months.

Methodological considerations

The 4:6:10 allocation reproduces the proportions of companies in each market-cap category. They do not recreate the index's free-float market-capitalisation weights. In addition, the actual 20 stock names, selection criteria, historical member date and exact data extraction methods have to be noted down. Another researcher cannot reproduce a study without those details.

Statistical reliability: Twenty securities are a relatively small cross-section. Consequently, the focus of the study should be on the monthly long–short portfolio alpha in its main inference, the complementary use of a Fama–MacBeth regression and the sensitivity of the choice of securities and trading costs. Dimson (1979) provides evidence that infrequent trading, especially of some small caps, may distort normal beta estimates.

3.RESULT AND DISCUSSION

3.1 Beta Anomaly in Indian Large-Cap Stocks (2021–2026)

Study period: 1 April 2021–31 March 2026 Sample: Maruti Suzuki (MARUTI), Tata Consumer Products (TATACONSUM), State Bank of India (SBIN), and Power Grid Corporation (POWERGRID).

3.1.1. Main empirical findings

Table 1: Beta-Return Relationships

Beta–return correlation	Low-minus-high beta	Portfolio test period
+0.618	−0.42%	48 months
Pearson's r; p = 0.382	Monthly mean; p = 0.549	April 2022–March 2026

Principal finding: The four-stock sample does not provide statistically significant evidence of a low-beta anomaly. The estimated beta–return association is positive but statistically insignificant, and the dynamically formed high-beta portfolio earns a higher average return than the low-beta portfolio. This does not establish that the beta anomaly is absent from the broader Indian large-cap market.

3.1.2. Stock-wise beta and return analysis

Table 2: Stock wise analysis

Stock	Beta*	Average monthly return	Annualized volatility	Price CAGR
Maruti Suzuki	0.919	1.22%	24.06%	12.41%
Tata Consumer	0.982	0.99%	23.20%	9.70%
State Bank of India	1.165	1.93%	25.89%	21.89%
Power Grid	0.934	1.70%	22.05%	19.55%

*Beta gets estimated against an equal-weighted portfolio of these four stocks, not the NIFTY 500. Results use 60 monthly observations and bonus-adjusted, dividend-excluded prices. The compounded annual growth rate (CAGR) is based on a closing price of 31 March 2021 through 30 March 2026.

The key finding is that the four-stock sample does not give a statistically significant low-beta anomaly. According to estimates, the association between beta and return is positive but statistically insignificant and the dynamically formed high beta portfolio earns a higher average return compared to the low beta portfolio. This does not imply that the beta anomaly does not exist in the overall Indian large-cap market.
Interpretation: SBI has the highest estimated beta (1.165) and the highest annualised price growth (21.89%) which are the ideal combinations while Tata Consumer has a high beta but the lowest CAGR (9.70%). Power Grid of PA performs better than most despite low beta value. The four firms do not show a perfectly ordered risk–return relationship.
The Pearson correlation is positive at 0.618 and p-value 0.382 The value for Spearman's rank correlation was 0.400, p = 0.600. Neither one has sufficient statistics to show there is a systematic positive or negative relationship at the 5% level

3.1.3. Low-beta versus high-beta portfolio performance

Every month, portfolios are constructed by ranking the four companies based on the beta estimates from the previous 52 weekly returns. The low-beta portfolio is made up of the two stocks with the smallest beta. Similarly, the high-beta portfolio is comprised of two stocks that have a higher beta. Every portfolio is weighted the same and rebalanced monthly.

Table 3.1.3.1 Beta-Performance

Performance indicator	Low-beta portfolio	High-beta portfolio
Average monthly return	1.09%	1.51%
Annualised geometric return	11.37%	17.49%
Cumulative price return	53.82%	90.56%
Initial investment	₹100	₹100
Ending portfolio value	₹153.82	₹190.56

The average difference between low and high returns is −0.42 percentage points per month or an arithmetic annualized difference of about −5.06 percentage points. The t-score of the Newey-West adjusted test is −0.600, with a p-value of 0.549 and a corresponding 95% confidence interval of −1.80% to +0.96%. This monthly confidence interval indicates the effect of the US dollar.
Interpretation: The high-beta portfolio performs better in numerical terms but the difference is not significant. The evidence put forth in the portfolio does not support the existence of a reliable low-beta premium for the selected companies. The returns do not consist of dividends, transaction costs, nor taxes.

4. Robustness across market regimes

The classification of market conditions is done based on the positive and negative monthly returns of four-stock benchmark rather than the NIFTY 500 actuals.

Table 3.1.3.2: Month Indicators

Indicator	Positive months	Negative months
Number of months	29	19
Low-beta mean monthly return	+4.24%	−3.72%
High-beta mean monthly return	+4.74%	−3.42%
Low-minus-high spread	−0.50%	−0.30%

HAC p-value	0.569	0.833
Significant at 5%?	No	No

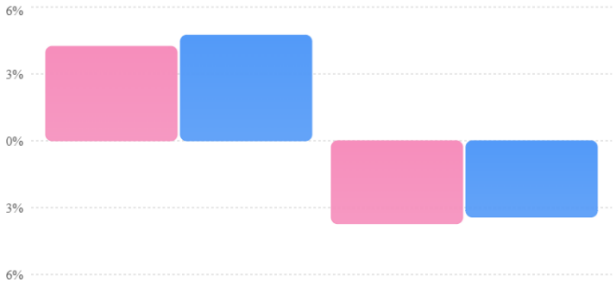


Figure 1: Monthly price returns; regimes defined by the internal four-stock benchmark

- Low-beta portfolio
- High-beta portfolio

Interpretations: High-beta portfolios provide mostly increasing and positive means in the positive as well as negative months of benchmarks. Nevertheless, the differences are statistically insignificant. The low-beta premium does not appear to arise in declining months, according to evidence. The mentioned results should not be labelled as confirmed Indian large-cap bull-market and bear-market effects until externally observed NIFTY 500 regimes are added.

3.2 Beta Anomaly in Indian Mid-Cap Stocks (2021–2026)

The study was conducted from 1st April 2021 to 31st March 2026. Six selected companies from NIFTY 500 mid-cap study group were used as the study sample. NIFTY 500 Price Index was the market benchmark used for the study. The statistical significance level used for the study was 5%.

In this sample of six stocks, companies with higher estimated market betas generally generated higher realised returns. The results do not demonstrate that the selected stocks have a statistically established low-beta anomaly.

The results depend on the input stock histories and the broad market benchmark. It is still too early to tell if the pattern persists across all of the 150 NIFTY 500 mid-cap players.

3.2.1. Descriptive statistics and estimated systematic risk

Table 3.2.1.1. Market beta, annualised returns and risk, May 2021–March 2026

Company	Beta (β)	Annual mean return	Price CAGR
Godrej Industries	0.978	14.35%	8.13%
Cochin Shipyard	1.802	58.23%	46.46%
Rail Vikas Nigam (RVNL)	1.995	66.08%	56.97%
Info Edge (NAUKRI)	1.247	3.52%	−0.32%
SRF	0.748	17.00%	13.89%
Dalmia Bharat	0.908	6.71%	3.44%

3.2.2. Nature and strength of the beta–return relationship

Table 3.2.1.2. Cross-sectional tests of beta and annualised mean stock returns

Statistical test	Estimated result	Interpretation
Pearson correlation (r)	+0.888	Strong positive linear relationship
Pearson parametric p-value	0.018	Significant under parametric assumptions
Pearson exact permutation p-value	0.054	Not significant at 5%
Spearman rank correlation (ρ)	+0.486	Moderate positive monotonic association
Spearman exact permutation p-value	0.356	Not significant
OLS coefficient of determination (R^2)	0.788	Descriptive in-sample explanatory fit

Interpretations: In this sample, stocks with a high beta tended to yield a higher return as the Pearson correlation is strongly positive. The exact permutation test does yield p = 0.054, just exceeding the 5% threshold but the parametric classic test yields 0.018. The implication of the exact-test result is an important qualification due to the small sample size of six companies.

The positive correlation is also sensitive to the abnormally strong performance of RVNL and Cochin Shipyard. The correlation shows that beta and returns are related but does not imply a causal relationship.

3.2.3. Low- and high-beta portfolio performance

Each month, the six securities were ranked using their estimated betas over the previous 24 months. Two stocks were assigned to each of the low-, medium-, and high-beta groups. The comparison below uses the low- and high-beta groups, equally weighted and reconstituted monthly.

Table 3.2.1. 3. Portfolio performance, May 2023–March 2026; 32 complete monthly observations

Performance measure	Low beta	High beta	NIFTY 500
Average monthly return	1.75%	4.58%	1.28%
Annualised arithmetic return	20.95%	54.97%	15.36%
Annualised volatility	21.72%	58.10%	14.60%

The high-beta portfolio delivered substantially higher average returns than the low-beta portfolio but experienced considerably greater volatility. Therefore, the higher return was accompanied by substantially higher total risk.

Because three months are omitted owing to missing Cochin Shipyard data, a continuous-calendar-period CAGR or complete investable wealth path cannot be calculated reliably from the six-stock panel. The reported annualised arithmetic means instead describe the 32 observed monthly returns.

Table 3.2.1.4. Statistical significance of the low-minus-high portfolio return spread

Statistical indicator	Estimated value
Mean monthly low-minus-high spread	−2.835 percentage points
Annualised arithmetic spread	−34.02 percentage points
Newey–West HAC t-statistic	−1.038
HAC p-value	0.299
95% confidence interval, monthly	−8.187 to +2.517 percentage points

Interpretation: The negative mean spread favours the high-beta portfolio, contrary to the conventional low-beta anomaly. Nevertheless, the p-value exceeds 0.05 and the confidence interval includes zero. The result therefore indicates observed high-beta outperformance without statistically conclusive evidence of a persistent premium.

3.3 Beta Anomaly in Indian Small-Cap Stocks (2021–2026)

3.3.1. Individual-stock beta and return analysis

Table 3.3.1.1 Estimated beta and annualised price-return performance, ranked by beta

Stock	Beta (β)	Annual mean return	Annual volatility
KPIT Technologies	0.850	22.20%	43.62%
Voltas	0.888	6.70%	33.94%
Aptus Value Housing	0.957	−6.41%	29.93%
UCO Bank	1.097	22.29%	51.59%
Birlasoft	1.143	1.96%	37.13%
Sarda Energy & Minerals	1.169	53.73%	44.91%
Kajaria Ceramics	1.185	−0.46%	33.51%

Beta is estimated as the ratio of the covariance of stock and market return to the market return variance. Annualized mean is gotten by multiplying the mean monthly return by 12 while annualized volatility is gotten by multiplying the monthly standard deviation by the squareroot of 12. Exclusion of dividends and transaction costs.

Interpretation: The relationship between beta and stock returns is not homogeneous. KPIT Technologies, which has the lowest beta of the stock under coverage at 0.850, generated an annualised average return of 22.20%. On the other hand, Sarda Energy & Minerals was able to attain the maximum average return of 53.73% for the period with a beta of 1.169. Kajaria Ceramics covered with the highest estimated beta of 1.185 has a negative average return.

These divergences suggest that systematic risk alone cannot be responsible for the rank ordering of returns. Nonetheless, even the presence of individual low-beta outperformers does not by itself yield a beta anomaly in a statistically significant manner.

3.3.2 Nature and strength of the beta–return relationship

Table 3.3.1.2 Cross-sectional correlation and explanatory strength

Statistical indicator	Estimated result	Interpretation
Pearson correlation (r)	+0.204	Weak positive association
Pearson parametric p-value	0.662	Not significant
Pearson exact permutation p-value	0.712	Not significant
Spearman rank correlation (ρ)	−0.036	Negligible negative rank association
Spearman exact permutation p-value	0.963	Not significant
Coefficient of determination (R^2)	0.041	Approximately 4.1% descriptive fit
Common-period monthly observations	54	Seven stocks

Interpretation: The pearson correlation reveals a weak positive association between the beta and average stock returns. The Spearman correlation is effectively zero, which indicates no monotonic ranking relationship. Neither slope has statistical significance.

The R^2 of the cross-sectional regression is only 0.041, indicating that differences in beta account for about 4.1% of the difference in average returns of the seven stocks. This measure should not be viewed as a universal estimate of beta's explanatory power in the Indian stock market because of its small cross-section.

4.CONCLUSION

The current research analyses the beta anomaly in the Indian stock market which is measured through the association between systematic risk and stock returns, tested across large-, mid-, and small-cap segments of the NIFTY 500 Index. The results show significant discrepancies in risk–return behaviour among different market capitalisations, with no observable or statistically significant evidence for the low-beta anomaly. Evidence exists that low-beta portfolios can sometimes outperform their high-beta alternatives. Portfolio comparison evidence suggests that low-beta portfolios can sometimes outperform their high-beta counterparts. However, in certain market segments, especially in up-markets, high-beta stocks generally have higher realised returns relative to low-beta equities. The paper adds to the asset-pricing literature by showing that beta pricing is heterogeneous in an emerging capital market and that beta cannot be relied upon as an independent predictor of investment performance. The importance of accounting for market capitalisation, changing market conditions and other risk factors in portfolio construction and investment decisions has been highlighted. Nonetheless, the small sample, unequal measuring period and data limitations constrain the generalizability of the results. Future research should utilize larger samples, longer investment horizons, and multifactor asset-pricing models to study the persistence and determinants of anomaly.

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