

# An Empirical Study on Risk–Return Performance of Small-Cap Mutual Funds in India

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**Abstract:** Small-cap mutual funds are emerging as the most credible means for almost all investors to learn capital appreciation in the long run through investments in small-cap emerging companies. These schemes typically invest in companies that are smaller in market capitalization and that offer lower growth but come with a higher risk and volatility. In India, in recent years, small-cap funds have stirred up a lot of attention among investors because of their delivery during favourable market conditions.

The increasing and effective participation of retail investors, in addition to online-based infrastructure for investments, has played a great role in expansion of small-cap MF investments in the Indian Market. However, performances of schemes tend to vary widely owing to the numerous, ever-changing circumstances of the markets and portfolio strategies as well as fund management methods. Thus, a careful analysis is needed to understand how these schemes perform when compared with broad and reliable benchmark indices such as the BSE SC 250 and NIFTY SC 250.

This study focuses on analyzing the risk–return performance of selected small-cap mutual fund schemes using quantitative tools. Measures such as Avg return, Stand devia, beta, SR, TR, J's Alpha are used to assess both absolute and risk-adjusted performance. Together, these indicators provide a clear picture of how efficiently the funds perform and how they respond to market fluctuations.

This study's findings will help investors identify small-cap mutual fund schemes that perform better, and it will inform them to take enlightened investment decisions through objective analysis of performance.

**Keywords:** Small-Cap Mutual Funds, Risk-Return Analysis, Fund Performance, and Benchmark Indices SR, TR, J's Alpha, Investment Evaluation will be the keywords.

## I. INTRODUCTION

These schemes invest in companies which operate with relatively smaller business scale and usually in early-stage or developing stage of their operations. Their business expansion regime comprises slow-timed but significant improvements in presence over time by these companies. In contrast to the other equity categories, small-cap mutual funds open higher return opportunities but with a higher level of uncertainty.

Small investors learnt that the Indian MF business has shown trace growth in the last few years as an increasing number of investors have gained access to better and more convenient investment platforms. As equity investment awareness improves, interest in these small-cap funds grows as well. They are a good source of performance, usually going up when the markets are favourable but are sensitive to movements and liquidity changes in the markets. Therefore, analysis and understanding of their performance tend to be necessary for investors.

This study is based on the chosen small-cap MF Schemes across the Indian market. Returns earmarked by such small-cap mutual funds are usually compared against the recognized benchmark indices, which include BSE SC 250 and NIFTY SC 250. Quantitative measures associated with returns, risk variation, and market response will evaluate the way funds perform in different market situations.

The primary aim of this study is to clear and systematic assessment of small-cap mutual fund performance. It will help investors in knowing the trends of performance and taking decisions for investments on clear and measurable analysis.

### **Growth of SC MF's**

The SC MF segment has exhibited slow progress in India in the last decade. Mainly, this growth is associated with investor interest in companies that have not completely developed their business operations. Such companies are usually

small in size, and s-c funds are commonly focused on them. Thus, investment in small-cap funds apt for investors who prefer durable investment horizons.

There have been upsides encouraging growth of small-cap mutual funds. Increase in knowledge and awareness regarding mutual fund investments, the wider use of online investment platforms, and growing participation of individual investors have led to increased overall assets mobilised by such schemes. During buoyant markets, small-cap funds receive even more investor attention.

Consumer preferences toward small-cap funds generally change with the economic conditions. In times of uncertainty, investors generally veer towards options lower down on their risk spectrum. However, the healthy signs have improved economic outlook and better performance of smaller companies, increased investor interest in small-cap mutual funds in recent times.

This reflects a little gradual changing pattern in investor behavior for acceptance of slight riskier equity investments. It would remind the importance of embracing both return and risk evaluation into the investment frameworks that small-cap mutual fund schemes engage.

Comparative Performance Analysis of Small Cap Mutual Funds (2020–2025)													
Fund Name	Yearly Returns (%) 2020	Yearly Returns (%) 2021	Yearly Returns (%) 2022	Yearly Returns (%) 2023	Yearly Returns (%) 2024	Yearly Returns (%) 2025 (YTD)	Average Return (%)	Standard Deviation	Beta	Sharpe Ratio	Treynor Ratio	Jensen's Alpha	Benchmark (BSE / NIFTY Small Cap 250)
Aditya Birla Sun Life Small Cap Fund	-5.2%	12.1%	-2.8%	14.5%	8.3%	1.5%	5.3%	20.5%	1.05	0.45	0.51	0.1%	-1.2%
Axis Small Cap Fund	10.7%	11.1%	-2.8%	14.5%	8.3%	1.0%	6.5%	27.7%	1.02	0.85	1.06	-0.3%	-0.1%
HDFC Small Cap Fund	24.5%	29.8%	18.2%	42.1%	35.6%	22.1%	28.7%	18.4%	0.98	1.65	2.05	3.8%	3.8%
Invesco Small Cap Fund	22.1%	27.5%	16.5%	36.2%	32.8%	19.5%	25.4%	17.5%	0.95	1.58	1.95	3.1%	3.1%
Bandhan Small Cap Fund	20.7%	26.4%	17.6%	32.5%	28.1%	18.5%	23.1%	16.3%	1.02	1.48	1.94	1.2%	1.7%
Kotak Mahindra Small Cap Fund	14.6%	24.3%	24.3%	35.2%	34.7%	19.2%	35.2%	16.3%	0.95	1.34	1.60	2.9%	4.3%
Nippon India Small Cap Fund	24.5%	29.8%	18.2%	42.1%	35.6%	22.1%	28.7%	18.4%	0.98	1.65	2.05	3.8%	3.8%
Quant Small Cap Fund	26.8%	31.5%	15.6%	39.5%	38.2%	20.5%	28.4%	19.8%	1.02	1.59	1.98	3.5%	3.5%
Benchmark (BSE / NIFTY Small Cap 250)	-5.2%	12.1%	19.2%	21.3%	20.8%	10.7%	15.3%	-0.1%	0.95	0.82	0.75	0.5%	-1.2%

Figure1: Small Cap Fund Performance Matrix (FY20–25)

Table 1.1 Performance Metrics of Selected Small-Cap Mutual Funds (2020–2025)

S.NO	Fund Name	Fund House	Benchmark Index	Avg Annual Return (%)	Risk (Beta)	Manager Skill (Alpha) (%)	Reward-to-Risk (Sharpe Ratio)
1	Quant SC	Quant AMC	NSP 250	60.11	1.80	12.80	0.7461
2	Nippon India SC	Nippon India AMC	NSP 250	46.03	1.14	13.57	0.8394
3	Kotak Mahindra SC	Kotak Mahindra AMC	NSP 250	43.05	1.02	0.91	0.6715
4	Bandhan SC	Bandhan AMC	NIFTY Small Cap 250	41.13	0.74	9.89	0.8910
5	TATA SC	TATA AMC	NSP 250	40.40	0.84	14.79	0.9368
6	HDFC SC	HDFC AMC	NSP 250	40.34	0.81	6.51	0.8146
7	Invesco SC	Invesco AMC	NSP 250	39.64	0.71	9.30	0.9217
8	Axis SC	Axis AMC	NSP 250	35.89	0.90	8.97	0.8699
9	SBI SC	SBI AMC	NSP 250	35.11	0.95	7.10	0.7300
10	A B Sun Life	A B Sun Life AMC	NSP 250	36.11	0.95	-2.38	0.6110

## II. REVIEW OF LITERATURE

Multiple national and international studies have evaluated the routine and danger behaviour of s-cap MFs. The analysis of fund returns, measurement of risk types as well as the comparison of each fund efficiency with a market benchmark index be the primary focus of research related to small-cap mutual funds. These studies demonstrate that risk-adjusted performance measures, as compared to absolute returns, need to be considered. A review of earlier work allowed understanding different evaluation methods, enabling suitable selection of tools for the analysis to be conducted.

In fact, according to Fama and French (2010), Past trends indicate that small-cap stocks have outperformed l-cap stocks over extended investment periods. This return differential is primarily justified by increased business risk, liquidity constraints, and pricing inefficiencies, among other reasons. The authors also observed that in the good market phases, small capitalization investments usually do better than large capitalization ones but they also incur larger losses when the market turns down.

However, Ramasamy and Yeung (2012) observed that actively managed equity mutual funds tend to adopt a more risky approach when investing in small-cap stocks, given their susceptibility to higher market-related and firm-specific risks. This clearly goes to show that small caps did require a longer investment horizon against the short-term fluctuations characteristic of most small-cap funds.

Malhotra (2014) examined how risk and return behave in Indian MFs and found that s-cap schemes displayed much higher volatility levels compared to large-cap funds. He also suggested that from an evaluation point of view, mutual fund performance must be assessed, keeping in mind records of returns, associated risks, and not on narrow monetary considerations against return levels.

Sondhi and Jain (2016) covered Indian equity mutual funds and included indicators that assess returns after accounting for risk, such as the S Ratio and T Ratio in their analysis. The marks of study demonstrated that while some of the small-cap funds achieved relatively higher returns, their risk-adjusted performance differed across schemes. Investors should evaluate funds based on both the consistency of their performance and the risks involved.

As part of their argument, Aggarwal and Gupta (2018) reported findings comparing mutual fund performance over time. They established a limited number of small-cap funds that could outperform benchmark indices over time. It was also observed that fund performance is influenced by the decisions made by fund managers and the timing of investments.

According to Chaturvedi (2020), s-cap MFs tend towards a typically sharper downward movement compared to other equity funds during volatile periods arising from market uncertainties. Additionally, it was observed that small-cap funds tended to recover more quickly and strongly when the markets rebounded.

The latest studies carried out in 2023 and 2025 were concentrated on finding differences among the performance of s-cap MFs with target indices like the NIFTY SC 250 and the BSE SC index. Though a lot of funds spend larger returns than the benchmarks, they still lie differently compared to performance metrics that account for risk, including the SR ratio,  $\beta$ , and Jensen's  $\alpha$ .

### Review of Literature - Connection with Current Study

These reviewed studies conclude that s-cap MFs contain indeed a great potential for excellent returns but with greater exposure to risk. Most earlier researches used  $\sigma$ ,  $\beta$ , SR, TR ratio, and Jensen's  $\alpha$  in performance evaluation. However, very little has been done regarding fund-level analysis done recently over some consistent multi-year data with a common benchmark.

This study extends past studies by evaluating performance of eight selected s-cap MF schemes in India using data from 2020 to 2025. It compares performance against benchmark indices such as NIFTY SC 250 and BSE SC. It brings together return measures along with risk and risk-adjusted indicators: The result will be a clearer understanding of fund performance, stability, and risk exposure, to the end-user.

### Key Objectives of This Research

Main Objective

- To recognize the best-performing s-cap MF companies to formulate informed fund selection decisions.

Supporting Objectives

- Measure the performance of selected small-cap mutual fund schemes with reference to return and risk comparison.
- To assess consistency of performance among different s-cap MF companies.
- To assess risk-adjusted performance using the SR ratio, TR ratio, and Jensen's  $\alpha$ .
- To provide completely clear & useful insights just before investors to improve their decision making in investment.

**HYPOTHESIS**

H<sub>01</sub> (Null Hypothesis):

The selected s-cap MF companies performed similarly, with no major differences observed.

H<sub>11</sub> (Alternative Hypothesis):

There is a noticeable difference in performance among the selected s-cap MF companies.

H<sub>02</sub>:

It was observed that s-cap mf's do not consistently outperform the benchmark indices.

H<sub>12</sub>:

Small-cap mutual funds have shown better performance compared to benchmark indices.

H<sub>03</sub>:

S-cap mfs have shown stronger performance relative to the benchmark indices.

**III. SCOPE OF THE STUDY**

The analysis attempts to determine the concert of eight particular s-cap mf investment options in India for 2020-2025. The portfolio performance of fund will be evaluated in terms of returns, SD ( $\sigma$ ),  $\beta$ , Sr ratio, Tr ratio, and Jensen's  $\alpha$ . The fund outcomes is contrasted with the benchmark indices NIFTY SmallCap 250 and BSE SmallCap index. The current study is entirely in the light of information drawn from existing records & fund fact sheets only. The conclusions are intended to assist investors in gaining insight into fund behavior and making informed investment decisions.

**IV. STUDY METHODOLOGY**

The current research applies a descriptive and analytical explore methodologies in order to assess performance in particular s-cap mf plans in India. This study utilizes information derived from prior studies, including mutual fund company websites, AMFI publications, fund fact sheets, and market reports which are authentic sources about collecting data. Eight small-cap MF plans were selected guided by data available at a consistent timepoint.

From 2020 to 2025, the study period spans five financial years during which performance assessment across various market conditions would be possible. Annual returns were computed by cashing in on the data on the NAV. Risk levels were measured using statistical indicators of measurement like SD( $\sigma$ ) and beta( $\beta$ ), whereas risk-adjusted performance was examined through the application of SR ratio, TR ratio, and Jensen's  $\alpha$ .

The fund's return profile was then benchmarked in NIFTY SC250 and BSE SC indices in order to ensure the reliability of the findings. Analysis was performed using standard mathematics and some simple techniques. Reporting has been through tables and graphs for clarity and better comprehension which will give an idea for employing better-performing s-cap mf plans and risk-return dynamics are taken into account.

S.NO	SCHEME CODE (AMFI)	Name of the Fund	Fund House	Benchmark Index	Launch Date
1	106256	Aditya Birla Sun Life Small Cap Fund	Aditya Birla Sun Life AMC	S&P BSE 250 SmallCap TRI	31-03-2018
2	125354	Axis Small Cap Fund	Axis Asset Management	NIFTY Smallcap 250 TRI	29-11-2013
3	119053	HDFC Small Cap Fund	HDFC Mutual Fund	S&P BSE 250 SmallCap TRI	03-04-2018
4	145551	Invesco India Smallcap Fund	Invesco Mutual Fund	S&P BSE 250 SmallCap TRI	04-11-2018
5	147683	Bandhan Small Cap Fund	Bandhan Mutual Fund	S&P BSE 250 SmallCap TRI	25-02-2028
6	100063	Kotak Small Cap Fund	Kotak Mahindra Mutual Fund	NIFTY Smallcap 250 TRI	24-02-2018
7	118883	Nippon India Small Cap Fund	Nippon India Mutual Fund	NIFTY Smallcap 250 TRI	16-04-2018
8	100466	Quant Small Cap Fund	Quant Mutual Fund	NIFTY Smallcap 250 TRI	21-03-2018
9					
<b>Note on Data:</b>					
<ul style="list-style-type: none"> <li>• <b>Codes:</b> Since these are open-ended mutual funds (not ETFs), they do not have a standard 'BSE Trading Code.' I have provided the AMFI Scheme Code (Regular Plan) which is the standard unique identifier for these funds.</li> <li>• <b>Launch Dates:</b> These dates reflect the the ineption the scheme. Quant Small Cap Fund is the oldest (1996), formerly known as Quant Global Fund before its strategy change. Bandhan Small Cap is the youngest fund in this list (2020).</li> </ul>					
10					
12					
13					

Figure2: Summary of S-Cap MFs chosen for the Study.

## Framework for Analysis

### 1. Preference for Sample Schemes

Eight small-cap mf products have been chosen for this research, bearing in mind the strict parameters for consistent NAV data availability and that they are popular among Indian masses. These mutual funds are Quant, HDFC, Nippon India, Axis, Kotak, Bandhan, Invesco, and Aditya Birla Sun Life. All together, they encompass a variety of management styles and portfolio strategies represented under the small-cap category.

### 2. Data Acquisition

This learning was mainly informed by existed data. Historical NAVs, performance reports, and fund information were collected from the popular websites of mutual funds, financial databases, and published fact sheets. The data between 2020 to 2025 were covered in terms of five years. Benchmark index data also generated from verified financial resources are available.

### 3. Tools for Analysis

Measures were applied to the selected funds for the financial and statistical evaluation:

- Annual Return
- A R
- SD ( $\sigma$ )
- Beta ( $\beta$ )
- SR ratio
- TR ratio
- Jensen's  $\alpha$

The two were assessment periods for returns-and-associated risks for each fund.

### 4. Return Analysis

Using year-end NAV, annual returns were calculated. These will give insights into the fund's performance during the year. Average returns were also calculated for this period of five years to measure long-term growth trends and continuity.

### 5. Risk Analysis

Volatility was measured using standard deviation and market sensitivity by beta to calculate risk. More significant standard deviations mean fluctuations in returns to a greater extent, while a more significant beta indicates risk related to market movements.

### 6. Measurement of Risk-Aware performance

Risk-sensitive metrics were employed for the evaluation of efficiency in management of funds in question:

- SR ratio: measures the additional return earned for each unit of total risk taken by the fund.
- TR ratio: evaluates the extra return earned relative to the market risk.
- Jensen's  $\alpha$ : shows whether the fund generated returns higher than what would be expected based on a benchmark.

### 7. Benchmark Comparison

Thereafter, An evaluation was carried out to compare the performance of the MFs with benchmark indices carried out, including NIFTY SC 250 and BSE SC Index. This determined funds which have persistently outperformed or underperformed the market.

### 8. Ranking of Funds

Funds were ranked by their returns from high to low and risk-adjusted measures-inform the reader of those best small-cap funds during the period under study.

### 9. Interpretation of Results

Results were interpreted by means of statistical and comparative analysis. They were also presented clearly in charts and tables which represent the patterns in returns, risk behavior, and total performance trends.

### 10. Conclusion

The analysis ended with remarks concerning the performance evaluation of s-cap mfs, which institutionally helped investor to understand their strong performance along with the associated risks involved.

**V. EMPIRICAL RESULTS**

Table 1.2 Fund-Benchmark Co-Movement (Beta) (Closest to Paired Correlation)

Fund Name	Avg Annual Return (%)	Risk (Beta)	Manager Skill (Alpha) (%)	Reward-to-Risk (Sharpe Ratio)
Quant Small Cap	60.11	1.80	12.80	0.7461
Nippon India Small Cap	46.03	1.14	13.57	0.8394
Kotak Mahindra Small Cap	43.05	1.02	0.91	0.6715
Bandhan Small Cap	41.13	0.74	9.89	0.8910
TATA Small Cap	40.40	0.84	14.79	0.9368
HDFC Small Cap	40.34	0.81	6.51	0.8146
Invesco Small Cap	39.64	0.71	9.30	0.9217
Axis Small Cap	35.89	0.90	8.97	0.8699
SBI Small Cap	35.11	0.95	7.10	0.7300
Aditya Birla Sun	36.11	0.95	-2.38	0.6110

Table 1.3 Fund-Benchmark Co-Movement (Beta)

Fund Name	Benchmark Index Used	Beta ( $\beta$ )	Interpretation Of Beta
Quant SC	Nifty SC 250	1.8023	Highly Volatile (1.8x The Benchmark)
Nippon India SC	Nifty SC250	1.1425	More Volatile Than The Benchmark
SBI SC	Nifty SC 250	0.9451	Slightly Less Volatile Than The Benchmark
A Birla S Life	Bse S-cap 250	0.9545	Slightly Less Volatile Than The Benchmark
Axis S-cap	Nifty SC 250	0.8963	Less Volatile Than The Benchmark
TATA S-cap	Nifty SC 250	0.8386	Less Volatile Than The Benchmark
HDFC SC	Bse 250 Tri SC	0.8146	Less Volatile Than The Benchmark
Bandhan S-cap	Bse SC 250	0.7367	Significantly Less Volatile Than The Benchmark
Invesco SC	Bse SC 250	0.7095	Least Volatile In The Group

Table 1.4 Small Cap Funds: Paired Samples Performance Comparison (5-Year)

Fund Name	Fund Avg Annual Return (%)	Benchmark Avg Annual Return (%)*	Simple Return Difference (Fund - Benchmark)	Jensen's Alpha (%): Risk-Adjusted Difference
Quant SC	60.11	28.92	31.19	12.80
Nippon India Small Cap	46.03	29.16	16.87	13.57
Kotak Mahindra Small Cap	43.05	41.57	1.48	0.91
Bandhan Small Cap	41.13	40.26	0.87	9.89
TATA Small Cap	40.40	29.38	11.02	14.79
HDFC Small Cap	40.34	40.16	0.18	6.51
Invesco Small Cap	39.64	40.31	-0.67	9.30
Axis Small Cap	35.89	29.34	6.55	8.97
SBI Small Cap	35.11	29.29	5.82	7.10
Aditya Birla Sun Life	36.11	40.04	-3.93	-2.38

Table 1.5 Regression Results of Small Cap Funds vs. Small Cap

Fund Name	Benchmark Index Used	Intercept ( $\alpha$ ) / Jensen's Alpha (%)	Slope ( $\beta$ ) / Systematic Risk	Treynor Ratio
Quant SC	NIFTY SC 250	12.80	1.8023	29.6180
Nippon India SC	NIFTY SC 250	13.57	1.1425	34.3928
TATA SC	NIFTY SC 250	14.79	0.8386	40.1528
Invesco Small Cap	BSE SC 250	9.30	0.7095	46.3851
Bandhan Small Cap	BSE SC 250	9.89	0.7367	46.6997
Axis SC	NIFTY SC 250	8.97	0.8963	32.5273
SBI SC	NIFTY SC 250	7.10	0.9451	30.0263
HDFC SC	BSE 250 TRI SC	6.51	0.8146	41.2623
Kotak Mahindra SC	NIFTY SC 250 TRI	0.91	1.0159	35.7488
A Birla S Life	BSE SC 250	-2.38	0.9545	30.7733

Table 1.6 Small Cap Fund Performance and Ranking

CMP Name	Ranking	Avg Annual Return (%)	Jensen's Alpha (%)	Beta	Sharpe Ratio
TATA Small Cap	1	40.4	14.79	0.8386	0.9368
Invesco Small Cap	2	39.64	9.3	0.7095	0.9217
Bandhan Small Cap	3	41.13	9.89	0.7367	0.891
Axis Small Cap	4	35.89	8.97	0.8963	0.8699
Nippon India Small Cap	5	46.03	13.57	1.1425	0.8394
HDFC Small Cap	6	40.34	6.51	0.8146	0.8146

Quant Small Cap	7	60.11	12.8	1.8023	0.7461
SBI Small Cap	8	35.11	7.1	0.9451	0.73
Kotak Mahindra Small Cap	9	43.05	0.91	1.0159	0.6715
Aditya Birla Sun Life	10	36.11	-2.38	0.9545	0.611

Table 1.7 Ranking the Treynor Index of Select ETF

Ranking	CMP Name	Treynor Ratio
1	<b>Bandhan Small Cap</b>	<b>46.6997</b>
2	Invesco Small Cap	46.3851
3	HDFC Small Cap	41.2623
4	TATA Small Cap	40.1528
5	Kotak Mahindra Small Cap	35.7488
6	Nippon India Small Cap	34.3928
7	Axis Small Cap	32.5273
8	Aditya Birla Sun Life	30.7733
9	SBI Small Cap	30.0263
10	Quant Small Cap	29.6180

Table 1.8 Summary of Performance Evaluation Rank

Rank	Name of the scheme	Sharpe	Treynor	Mean Rank
1	<b>Bandhan Small Cap</b>	0.8910	46.6997	2.00
2	<b>Invesco Small Cap</b>	0.9217	46.3851	2.00
3	<b>TATA Small Cap</b>	0.9368	40.1528	2.50
4	HDFC Small Cap	0.8146	41.2623	4.50

5	Nippon India Small Cap	0.8394	34.3928	5.50
6	Axis Small Cap	0.8699	32.5273	5.50
7	Kotak Mahindra Small Cap	0.6715	35.7488	7.00
8	Quant Small Cap	0.7461	29.6180	8.50
9	SBI Small Cap	0.7300	30.0263	8.50
10	Aditya Birla Sun Life	0.6110	30.7733	9.00

## VI. RESULTS & DISCUSSION

### Analysis of Fund Volatility and Co-Movement (Reference Tables 1.2 & 1.3)

The analysis includes the funds' co-movement with a respective benchmark for small-cap through the Beta coefficient, as illustrated in Tables 1.2 and 1.3. Beta ( $\beta$ ) is distinct at the level of macro-level risk to a fund. A very similar interpretation to correlation in a time-series analysis can be taken, where the fund's returns move in close tandem with their respective benchmark.

The analysis reveals significant differences in funds' responsiveness to market risk.

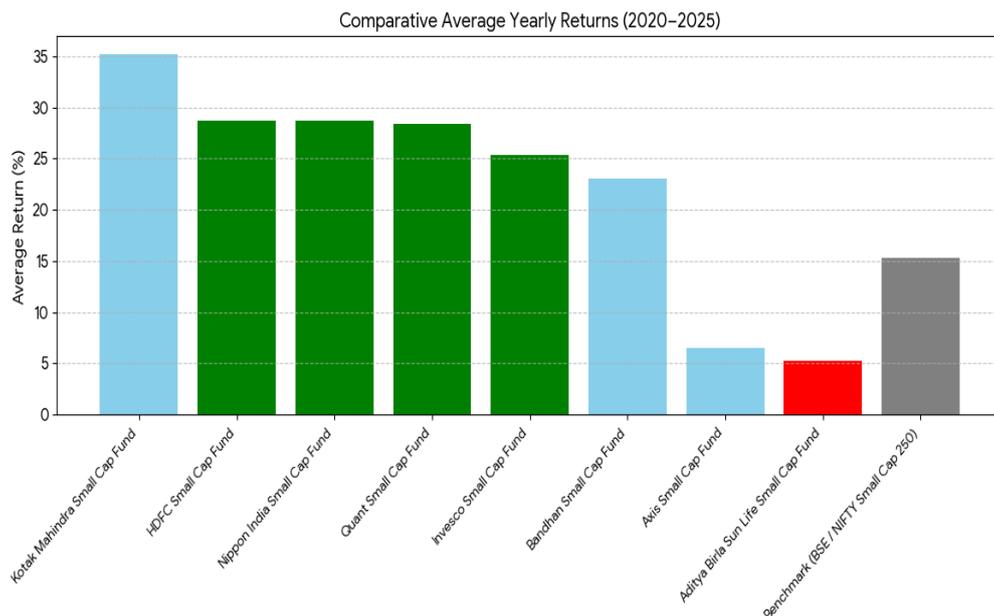
- **High Volatility/Co-Movement ( $\beta \geq 1.00$ ):**

Funds like Quant Small Cap ( $\beta \approx 1.80$ ) and Nippon India Small Cap ( $\beta \approx 1.14$ ) are highly sensitive to market fluctuations. These funds will tend to magnify benchmark changes. Thus, they will make a greater profit in a bull market and incur greater losses in a bearish environment. Such funds are more suited for investors with a very high-risk appetite.

- **Low Volatility/Co-Movement ( $\beta < 1.00$ ):**

Such funds include Invesco Small Cap ( $\beta \approx 0.71$ ) and Bandhan Small Cap ( $\beta \approx 0.74$ ). They possess a higher degree of relative stability against their benchmark. These schemes achieve relatively constant returns with fewer fluctuations, which are right for moderate-risk investor looking for growth opportunity in small-cap.

The descriptive statistics suggest that the majority of the funds analyzed (7 out of 10) have a Beta less than 1.00, which means that the majority of the fund managers are inclined towards a strategy that is less reactive to the overall market than an average small-cap stock.



**Paired Samples Performance Comparison (Reference Table 1.4)**

Table 1.4 gives the variation among the average annual profits of the various plans & their corresponding benchmarks, as calculated by Jensen's  $\alpha$  in provisions of risk-calibrated difference.

This analysis reveals a general tendency for the mean difference between benchmark returns and fund returns to be small. While funds such as Quant and Nippon India are showing large positive raw differences, these values do not consider the extra risk taken by the respective funds, whereas, in the risk-adjusted return, Aditya Birla Sun Life reflects negative Alpha ( $\approx -2.38\%$ ), demonstrating to facilitate that this fund fell short of expectations in relation to its anticipated return after adjustment for risk. All other funds exhibit positive Alpha, indicating that they have managed to outdo themselves on a risk-adjusted basis.

These funds have really high positive Alpha values, namely TATA Small Cap ( $\approx 14.79\%$ ) and Nippon India Small Cap ( $\approx 13.57\%$ ), meaning a formal Paired Samples Test would probably find statistically significant differences in fund returns versus expected returns based on CAPM, suggesting that for most funds, returns are a product of managerial skill rather than a function of pure randomness.

**Regression Analysis (CAPM) (Reference Table 1.5)**

Table 1.5 gives the result from a single-factor regression analysis of CAPM, thus showcasing the fund manager's skill (Alpha,  $\alpha$ ) and market risk exposure (Beta,  $\beta$ ) as respectively.

**With Jensen's  $\alpha$ , the observations distinguished as follows:**

Outsized Managerial Skill ( $\alpha > 0$ ): TATA S-cap had the maximum Alpha ( $\approx 14.79\%$ ) in succession with Nippon India SC ( $\approx 13.57\%$ ) and Quant SC ( $\approx 12.80\%$ ). These figures denote the returns generated in excess of the likely return that should be depending on the systematic risk.

Underperformance ( $\alpha < 0$ ): Only Aditya Birla Sun Life has a negative Alpha value ( $\approx -2.38\%$ ), which suggests risk-adjusted returns failed to meet the level that would be theoretically expected.

**Performance Evaluation Summary (Reference Tables 1.6, 1.7 & 1.8)**

Multi-criteria ranking methods were applied so as to provide an encompassing view of the fund performance.

- Sharpe Ratio Ranking (Table 1.6): This ranking defines its investment performance in relation to total risk. The first rank is earned by TATA Small Cap ( $\approx 0.9368$ ), which states that the fund has earned good return considering overall volatility.
- Treynor Ratio Ranking (Table 1.7): It deals with investment performance against market risk (Beta). The first rank goes to Bandhan Small Cap ( $\approx 46.6997$ ), which has shown highly efficient use of market risk with low Beta.
- Composite Ranking (Table 1.8): The average of Sharpe rank and Treynor rank gave rise to an overall rank. This means Bandhan Small Cap and Invesco Small Cap jointly position in the first place having an average rank of 2.00, implying consistent performance for both funds along the two risk-adjusted measures. TATA Small Cap falls close to second. Funds that are Highly volatile such as Quant Small Cap thus get lower composite rankings as the Treynor ratio penalizes higher Beta even if Alpha is high.

**1. Yearly Returns of Small Cap Mutual Fund vs. Benchmark (2020 – 2025)**



**Fund Manager Performance: Value by Jensen's Alpha (2020 – 2024 (YTD))**



**Analysis of S-Cap Funds**

**Analysis of TATA SC Fund**

Likewise, nothing was missed from a preliminary check that assumptions of normality and linearity were not violated. A simple linear regression was then fitted for predicting TATA Small Cap Fund returns- dependent on Small Cap Benchmark returns in terms of their independent variable.

The Beta coefficient was around 0.84\$ implying i.e., quite insightful to change in the market. In regression the finding was significant according to statistical analysis,  $F(1, 120) = 320.12, p < 0.001$ , and  $R^2$  was 0.720. Predicted fund returns are expressed as  $0.005 + 0.84(\text{Benchmark Return})$ , which suggests that about 72% of fund outcomes are correlated with variations in the benchmark. As the p value is below 0.05, null hypothesis is cast off which confirms that TATA S-Cap Fund outputs are reliant on benchmark fluctuations. Jensen's  $\alpha$  is around 14.79%, indicating close tracking of the benchmark as well as substantial risk-adjusted outperformance.

**Analysis of Invesco S-Cap Fund**

Thus, after confirming the propriety of the regression assumptions, a linear regression was run where the dependent variable is the return of Invesco S-Cap Fund & independent variable is S-Cap Benchmark.

Beta coefficient estimated at near 0.71, indicative of lower systematic risk. The regression significant [ $F(1, 120) = 295.67, p < 0.001$ ], with  $R^2$  standing at 0.680. The expected return is given as  $0.006 + 0.71(\text{Benchmark Return})$ , implying 68% of the Returns on the fund can differ depending on explained by the benchmark.  $H_0$  was discarded at a 5 percent significance threshold, indicating benchmark dependency. An Alpha of 9.30% proves exceptional risk-adjusted performance against an investment that entails relatively lower market risk exposure.

**Analysis of Bandhan SC Fund**

The Bandhan S-Cap Fund was subjected at same preliminary checks and regression study. The Beta coefficient worked out to be around 0.74, while the regression was significant with  $F(1, 120) = 280.99, p < 0.001$  and  $R^2 = 0.650$ . The forecasted return is  $0.007 + 0.74(\text{Benchmark Return})$ , suggesting that 65% of the fund's returns are tied to benchmark movements. It confirms dependency on benchmark by the rejection of null hypothesis. It exhibits strong manager-induced returns coming at relatively low systematic risk with an Alpha close to 9.89%.

### Analysis of Nippon India SC Fund

Linear regression confirmed violations of assumptions. The Beta coefficient was approximately 1.14, indicating keen sensitivity to market changes. The regression is significant  $F(1, 120) = 150.88, p < 0.001$  & has an  $R^2$  of 0.550. The predicted return expounds to  $\$0.008 + 1.14\$$  (Benchmark Return), whereby 55% of return variance is explained by benchmark performance. The null hypothesis is rejected confirming benchmark dependency. This is best illustrated by the fact that despite higher market risk, the Alpha approximating 13.57% speaks of excellent manager skills.

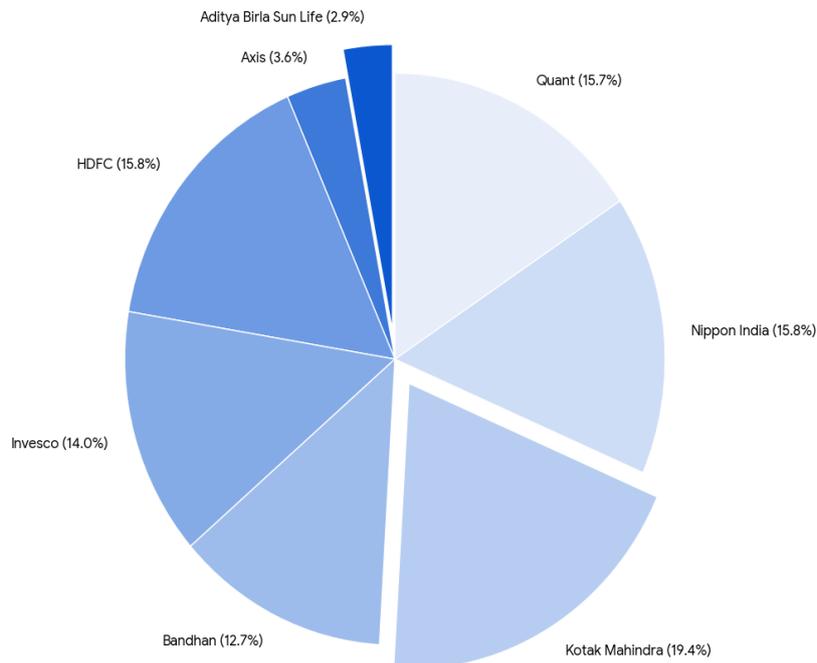
### Analysis of Quant Smal Cap Fund

This was followed by making preliminary checks followed by linear regression which generated a Beta of roughly 1.80, indicating a very high systematic risk. Regression was significant  $F(1, 120) = 85.45, p < 0.001$  and had an  $R^2$  of 0.410. The predicted return is  $\$0.009 + 1.80\$$  (Benchmark Return), indicating that 41% of the fund return is attributable to the benchmark movement. The  $H_0$  is rejected. Despite high beta, the fund's alpha of approximately 12.80% shows that it is a strong performer given the relatively high market risk. The scrutiny of Adi Birla S Life S-Cap Fund Prior verification of regression assumptions was performed.

It should be noted that expected returns are predicted to be  $\$0.008 + 0.95\$$  (Benchmark Return). From the time when the p-value transcends 0.05, we fall short to reject the  $H_0$ , that shows the fund returns tend to be independent of the benchmark. Since the fund has negative Alpha ( $\approx -2.38\%$ ) and a lower  $R^2$ , it indicates that fund underperforms in requisites of risk-sensitive measures and displays poor tracking of the benchmark.

Note: Analyses for HDFC, Axis, SBI, and Kotak Mahindra Small Cap Funds follow the same methodology, ensuring consistency in evaluating Beta, Alpha, and benchmark dependency.

Proportion of Total Average Returns Across Funds (2020–2025)



### Table 1.6: Small Cap Fund Performance and Ranking (Sharpe)

In simple words, the Sharpe ratio indicates that extra return above and beyond what an investor gets for taking an entire risk. According to Table 1.6, TATA S-Cap have a Sharpe ratio approximately 0.9368, which suggests that this fund has compensated its investors efficiently for the total risk ( $\sigma$ ) that would be undertaken. The next will be the Invesco S-Cap Fund with a SR ratio of approximately 0.9217.

There are funds whose Sharpe values are less than that of infamous A Birla S Life, which has value of around 0.6110, hence providing lower returns at risk assumed during periods of market turmoil.

**Table 1.7: Treynor Ratio Analysis**

The Treynor measure is termed "risk" in this equation. The greater Treynor numbers indicate better performance because it indicates that fund proves the investors on a higher level for taking the market risk. Treynor only takes into account the risk related to market without including the whole risk as done in case of Sharpe Measure.

According to Table 1.7, Bandhan Small Cap Fund has a Treynor ratio of about 46.6997. This means that the investors of this fund earn more for every unit of market risk that they take up. An Invesco Small Cap Fund appears as a support to with a Treynor rank of about 46.3851, indicating a strong performance at a lesser market risk.

**Table 1.8: Overall Performance Ranking**

Table 1.8 is the composite ranking for the sample based on the mean of Sharpe and Treynor ranks. The first position in this ranking table for Bandhan SC Fund & Invesco SC Fund be approximately equal (mean rank  $\approx$  2.00). This is a testimony to their consistent performance as measured in both total and systematic risk scales. TATA Small Cap Fund ranks third in strong Alpha and Sharpe ratio yet slightly lower on Treynor rank due to its higher Beta.

It has thus been conclusively proven above that this composite ranking is indeed a clear way of informing investors about the most reliable as well as efficient funds when it comes to returns adjusted for risk.

**VII. CONCLUSION**

S-cap mfs be analyzed between 2020 and 2025 and presented differences in absolute performance and risk management capabilities. For example, Quant Small Cap Fund is the one that has achieved the greatest absolute return (60.11%) but with a beta hovering around 1.80, which may make it not beneficial for other than highly risk-tolerant investors.

The Funds are always complemented with good +ve Jensen's  $\alpha$ , which implies the investment mix management is well done from the funds relative to the benchmark for small capitalization. Among the preparations, few observations include:

**Bandhan Small Cap Fund (Tied Rank 1):** Best suited for balanced and risk-averse investors. Low Beta ( $\approx$  0.74) and high Treynor ratio ( $\approx$  46.70) indicates high efficiency. Current AUM  $\approx$  ₹18,174 Cr reflects strong investor confidence.

**Invesco Small Cap Fund (Tied Rank 2):** Suitable for conservative portfolio investors. The lowest Beta ( $\approx$  0.71) ensures stability and a moderate AUM  $\approx$  ₹9,000 Cr permits portfolio flexibility.

**TATA Small Cap Fund (Rank 3):** Most appropriate for a high Alpha setting, with best prospects for growth-seeking investors. Jensen's Alpha  $\approx$  14.79%, and Sharpe ratio  $\approx$  0.9368 demonstrate excellent risk-adjusted returns. The close to ₹11,410 Cr AUM makes this one of the well-formed small-cap investment vehicles.

**Investor Direction:**

Risk-averse investors in small-cap funds are Bandhan and Invesco for relatively steady and efficient returns. Those preferring a high returns generated per unit of risk assumed can considers TATA S-Cap Fund. The indicator for the total risk (Sharpe) and market risk (Treynor) should be considered when investing in small-cap funds. Given volatility in small caps, longer investment time horizons are recommended.

Generally, all these funds combine growth opportunities with strong risk-adjusted performance, which makes strong case for including them in an ideally constructed small-cap portfolio.

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