

# Comprehensive Analysis of Global Industrial Investment Funds: Risk Adjusted Performance Evaluation Based on Statistical Tools 2017-2021

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**Abstract:** *This study delves into the intricate landscape of equity mutual funds, employing a comprehensive analysis of top-performing schemes from ten prominent Asset Management Companies (AMCs) over a five-year period (2017-2021). Using a robust methodology that integrates risk and return assessments, the study employs statistical tools such as standard deviation, beta, Sharpe ratio, Treynor ratio, Jensen's alpha, Fama index, and M2 measures to evaluate the risk-adjusted performance of selected funds against the benchmark index Nifty 50. The findings reveal that despite market fluctuations in 2018, certain schemes, notably Axis Blue Chip Fund Direct Plan Growth and UTI Flexi Cap Fund Direct Growth, demonstrated resilience and outperformed the benchmark, offering investors a favourable risk-return profile. The study aids investors in making informed decisions by providing insights into historical performance, emphasizing the importance of thorough research before venturing into equity mutual fund investments.*

**Keywords:** Mutual Funds, Performance Appraisal, risk, return

**GEL Codes:** G23. G11

## 1. Introduction

The Indian mutual fund industry, established in 1963, has rapidly expanded, driven by the liberalization, privatization, and globalization of the economy. Investors are attracted to mutual funds for benefits like risk diversification and professional management, although high returns are just one aspect. Returns can vary, and despite diversification, specific returns are not guaranteed. Confidence waned due to aggressive sales tactics and a lack of awareness, prompting mutual fund companies to introduce new schemes. The study aims to enhance investor awareness by analyzing both positive and negative aspects, providing insights into recent performance scenarios and unveiling a conceptual framework for understanding the investment process and the role of fund management in the dynamic landscape.

## 2. Literature Review

The literature review on the "Performance Appraisal of Mutual Funds" offers a comprehensive exploration of diverse research contributions. Jensen (1968) introduced a composite portfolio evaluation technique emphasizing risk-adjusted metrics, while Malviya and Khanna (2020) assessed the riskiness of equity shares compared to mutual funds through historical Net Asset Value (NAV) analysis. Sapor and Madava (2003) utilized multiple indices to evaluate Indian mutual funds, revealing that a majority of open-ended fund schemes met investor expectations. The studies also cover aspects such as the significance of the time perspective in mutual fund investments (Maheshwari, 2020), the execution consistency of mutual funds (Gupta and Sehgal, 1998), and the exploration of financial market systems (Mishra, 2017). The collective insights from these studies

contribute to a nuanced understanding of mutual fund performance, providing valuable guidance for both investors and practitioners in the field.

## 3. Statement of the problem

Even though investors are becoming more interested in mutual funds and they are becoming more prominent in the Indian financial scene, a thorough assessment of the efficacy and performance of open-ended mutual fund schemes is urgently needed. A detailed study is necessary in the current financial environment, which is characterised by volatility and a wide range of investment opportunities, to help investors make well-informed judgements. Even though a lot of research has been done on many elements of mutual fund performance, there is still a lack of work done on combining the knowledge from the literature to create a comprehensive analysis of important performance measures.

The main issue raised by the problem statement is the absence of a comprehensive knowledge of the relative effectiveness of certain mutual fund schemes in India. Investors must have clarity on the many options open to them because they experience difficulties in doing so.

## 4. Research Design

### Type of Research:

The study adopts an analytical and descriptive approach to assess various open-ended mutual fund schemes, aiming to comprehensively analyze their overall effectiveness. The research incorporates literature review, expert consultation, and other methodologies to delve into the multifaceted aspects of investment decision-making, contributing to a

nanced understanding of the subject. The analytical inquiry is anchored in the examination of secondary data, forming the basis of the study. Utilizing quantitative data from secondary sources, the analysis focuses on annual closing and opening Net Asset Value (NAV) of mutual fund schemes over a period of five years, employing key metrics such as the Sharpe ratio, Treynor ratio, Jensen alpha, Fama index, and M2 measure.

The study outlines specific objectives:

- 1) Evaluate and contrast the performance of selected mutual fund programs in India.
- 2) Determine the potential of mutual funds to reward changeability and volatility.
- 3) Assess mutual fund performance using the Sharpe, Treynor, and Jensen models.
- 4) Evaluate the effectiveness of chosen strategies through the Fama measure.
- 5) Determine if the funds outperform the benchmark average using the M2 measure.

The scope and significance of the study are underscored by the need for clarity in mutual fund investment choices amid the sector's remarkable growth. The comparative analysis of top-performing mutual funds aims to assist investors in creating portfolios with maximum returns for specific risk levels. The study's findings are expected to guide future decision-making, providing valuable insights for investors to maintain control over their investments. The study's relevance extends to both general investors and the mutual fund industry, offering informed perspectives on fund performance and bolstering trust in financial institutions.

The sampling technique involves selecting the top ten asset management firms based on their highest assets under management as of June 30, 2022. Two equity schemes from each chosen asset management firm, totaling 20 schemes, are selected for evaluation based on popularity and likelihood of returns in the next five years. Secondary data for the study is sourced from reputable platforms, including the Association of Mutual Funds in India website, RBI website, National Stock Exchange official websites, etc.

The following table shows that asset under management of AMC and selected Mutual fund schemes.

However, the study acknowledges certain limitations:

- 1) The data collection is confined to the most recent five years, limiting the sample size.
- 2) Past performance may not guarantee future results.
- 3) Macro-level data may influence returns, as micro-level data have been employed in the analysis.
- 4) The study's focus on equity funds may limit its applicability to non-equity fund investors.

#### **A brief profile of the selected Mutual Fund Schemes:**

- 1) SBI Small Cap Fund Direct Growth: Launched on June 29, 1987, it aims to provide long-term capital growth with a moderately high-risk profile.
- 2) SBI Technology Opportunities Fund Direct Growth: Introduced on June 29, 1987, it seeks long-term capital appreciation with a very high-risk profile.

- 3) ICICI Prudential Technology Direct Plan Growth: Launched on October 12, 1993, it aims for long-term capital appreciation in technology-related companies with a very high risk.
- 4) ICICI Prudential Small Cap Fund Direct Plan Growth: Introduced on October 12, 1993, it targets capital appreciation with a very high risk.
- 5) HDFC Small Cap Fund Direct Growth: Initiated on December 10, 1999, it focuses on long-term capital appreciation with a very high risk.
- 6) HDFC Midcap Opportunities Direct Plan Growth: Introduced on December 10, 1999, it seeks capital appreciation/income primarily in Mid-Cap companies with a very high risk.
- 7) Kotak Small Cap Fund Direct Growth: Established on August 5, 1994, it aims to generate capital appreciation with a very high risk.
- 8) Kotak Emerging Equity Fund Direct Growth: Introduced on August 5, 1994, it seeks long-term capital appreciation primarily in mid-cap companies with a very high risk.
- 9) Aditya Birla Sun Life Digital India Fund Direct Growth: Launched on December 23, 1994, it aims for capital growth in technology-related businesses with a very high riskometer.
- 10) Aditya Birla Sun Life Flexi Cap Fund Direct Growth: Initiated on December 23, 1994, it focuses on long-term capital growth and income with a very high riskometer.
- 11) Nippon India Small Cap Fund Direct Growth: Introduced on June 30, 1995, it targets long-term capital appreciation by investing primarily in small-cap equity with a very high riskometer.
- 12) Nippon India Pharma Fund Direct Growth: Launched on June 30, 1995, it seeks consistent returns by investing in pharma and related companies with a very high riskometer.
- 13) Axis Blue Chip Fund Direct Plan Growth: Introduced on September 4, 2009, it aims for long-term capital growth by investing in a diverse portfolio of large-cap company equity with a very high riskometer.
- 14) Axis Midcap Direct Plan Growth: Established on September 4, 2009, it seeks long-term capital appreciation by investing primarily in Mid Cap equity with a very high riskometer.
- 15) UTI Mid Cap Fund Direct Growth: Introduced on November 14, 2002, it aims for long-term capital appreciation by investing primarily in mid-cap equity with a very high riskometer.
- 16) UTI Flexi Cap Fund Direct Growth: Established on November 14, 2002, it focuses on long-term capital appreciation by investing primarily in equity and equity-related securities of companies with varying market capitalization with a very high riskometer.
- 17) IDFC Sterling Value Fund Direct Growth Fund: Launched on December 20, 1999, it employs a value investment strategy to generate capital appreciation with a very high risk.
- 18) IDFC Tax Advantage Direct Plan Growth: Introduced on December 20, 1999, it aims to construct a diverse portfolio of stocks from companies with strong fundamentals available at reasonable valuations with a very high risk.

- 19) DSP Small Cap Direct Plan Growth: Launched on December 16, 1996, it seeks long-term capital appreciation by investing in a portfolio primarily comprised of small-cap stocks with a very high riskometer.
- 20) DSP Tax Saver Direct Plan Growth: Introduced on December 16, 1996, it aims to generate medium to long-term capital appreciation
- 21) Performance appraisal involves application of Sharpe ratio, Treynor ratio, Jensen alpha, Fama measure and M2 measure.

### 5. Results and Discussion

Here we observe the performance of the selected mutual fund schemes in terms of various parameters such as average

return, standard deviation, and beta. Standard performance evaluation measures, such as the Sharpe index, Treynor index, Jensen index, Fama index and M2 measures were used to assess the risk-return relationship of the twenty selected schemes of the ten selected mutual funds from January 2017 to December 2021.

#### Mean Return:

The portfolio's return is calculated using annual Net Asset Value (NAV) data from various schemes. Here, closing NAV of one year considered as the opening NAV of another year.

The analysis of the average return of the selected schemes and benchmark is presented in the table below.

**Table 1:** Year-wise average return of selected schemes and benchmark

Sl. No	Schemes	2017	2018	2019	2020	2021	Average return
		R <sub>p</sub>	R <sub>p</sub>	R <sub>p</sub>	R <sub>p</sub>	R <sub>p</sub>	( $\bar{R}_p$ )
1	Axis Blue chip Fund Direct Plan Growth	41.29	8.58	20.19	20.82	22.31	22.64
2	Axis Mid cap Direct Plan Growth	45.22	5.02	12.78	28.04	42.14	26.64
3	Kotak Small cap Fund Direct Growth	48.10	-16.85	5.57	38.70	69.00	28.91
4	Kotak Emerging Equity Fund Direct Growth	45.99	-10.68	9.50	25.27	48.23	23.66
5	Nippon India Small cap Fund Direct Growth	67.37	-15.77	-2.60	31.83	76.66	31.50
6	Nippon India Pharma Fund Direct Growth	9.71	3.78	2.26	68.56	25.84	22.03
7	HDFC Small cap Fund Direct Growth	65.63	-6.91	-9.37	22.91	66.41	27.74
8	HDFC Mid cap Opportunities Direct Plan Growth	45.61	-11.11	1.30	23.78	41.27	20.17
9	SBI Small cap Fund Direct growth	83.71	-19.30	8.02	33.54	49.02	31.00
10	SBI Technology Opportunities Fund Direct Growth	13.40	21.10	13.18	48.76	66.06	32.50
11	ICICI Prudential Technology Direct Plan Growth	-0.89	21.08	4.07	70.92	77.78	34.59
12	ICICI Prudential Small cap Fund Direct Plan Growth	45.42	-22.26	9.97	26.98	63.29	24.68
13	UTI Midcap Fund Direct Growth	44.40	-14.08	0.15	34.62	45.18	22.05
14	UTI Flexi cap Fund Direct Growth	32.40	4.46	12.25	32.50	35.58	23.44
15	IDFC Sterling Value Fund Direct Growth Fund	64.96	-12.19	-5.95	18.15	66.30	26.25
16	IDFC Tax Advantage Direct Plan Growth	56.81	-8.11	2.51	21.19	50.91	24.66
17	DSP Small cap Direct Plan Growth	44.66	-25.41	-1.38	39.51	60.42	23.56
18	DSP Tax Saver Direct Plan Growth	40.33	-6.83	15.35	16.88	36.67	20.48
19	Aditya Birla Sun Life Digital India Fund Direct Growth	24.48	16.77	11.30	59.42	72.50	36.89
20	ICICI Prudential Technology Direct Plan Growth	35.40	-2.84	10.20	15.79	31.07	17.92
	Nifty 50	28.27	3.14	11.82	14.59	23.99	16.362

Source: Data Analysis

#### Interpretation:

The table illustrates the year-wise annual average return of selected mutual fund schemes and the benchmark index. In 2017, with the exception of ICICI Prudential Technology Direct Plan Growth (-0.89%), all other schemes yielded positive returns. In 2018, several schemes, including SBI Technology Opportunities Fund Direct Growth (21.10%), outperformed the market, while DSP Small cap Direct Plan Growth (-25.41%) recorded the lowest return. In 2019, only four schemes had negative returns, with Axis Blue Chip Fund Direct Plan Growth (20.19%) delivering the highest return. In 2020, all schemes outperformed the market, led by ICICI Prudential Technology Direct Plan Growth (70.92%). Similarly, in 2021, all schemes had positive returns, except Axis Blue Chip Fund Direct Plan Growth (22.31%). Analyzing the five-year average returns, all schemes displayed positive performance, with Aditya Birla Sun Life Digital India Fund Direct Growth (36.89%) recording the

highest average return and Aditya Birla Sun Life Flexi Cap Fund Direct Growth (17.92%) the lowest.

#### Risk:

Standard deviation ( $\sigma$ ) was used to assess the risk of mutual fund schemes and the market index. It is a tool that measures the deviation of mutual fund schemes' returns from their expected rate of return over a given time period. A higher standard deviation indicates that the schemes are riskier and more volatile. The analysis of the standard deviation of the selected schemes and benchmark is presented in the table below.

**Table 2:** Standard deviation of the annual return of selected schemes and benchmark

Sl. No	Schemes	Standard Deviation
		$\sigma$
1	Axis Blue chip Fund Direct Plan Growth	11.78
2	Axis Mid cap Direct Plan Growth	17.66
3	Kotak Small cap Fund Direct Growth	34.32
4	Kotak Emerging Equity Fund Direct Growth	24.92
5	Nippon India Small cap Fund Direct Growth	41
6	Nippon India Pharma Fund Direct Growth	27.64
7	HDFC Small cap Fund Direct Growth	37.19
8	HDFC Mid cap Opportunities Direct Plan Growth	24.7
9	SBI Small cap Fund Direct growth	39.27
10	SBI Technology Opportunities Fund Direct Growth	23.76
11	ICICI Prudential Technology Direct Plan Growth	37.28
12	ICICI Prudential Small cap Fund Direct Plan Growth	32.96
13	UTI Midcap Fund Direct Growth	27.28
14	UTI Flexi cap Fund Direct Growth	14.1
15	IDFC Sterling Value Fund Direct Growth Fund	37.69
16	IDFC Tax Advantage Direct Plan Growth	28.72
17	DSP Small cap Direct Plan Growth	35.63
18	DSP Tax Saver Direct Plan Growth	18.98
19	Aditya Birla Sun Life Digital India Fund Direct Growth	27.34
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	15.6
	Nifty 50	9.98

Source: Data Analysis

**Interpretation:**

The table outlines the risk, measured by standard deviation, of selected schemes and the market. In contrast to the market risk of 9.98%, all the schemes exhibit higher risk. Notably, IDFC Sterling Value Fund Direct Growth Fund carries the highest risk among the schemes, standing at 37.69%, while Axis Blue Chip Fund Direct Plan Growth has the lowest risk among the schemes, registering at 11.78%.

**Beta:**

Beta, also known as systematic risk, measures the volatility of an investment's returns in response to its market return. A beta value greater than one indicates that the scheme is more volatile than the benchmark index. It is described as an aggressive fund. If the beta is less than one, the investment is less risky when compared to the market index. This type of investment is referred to as defensive. If the beta is one, the portfolio and the benchmark index are both moving in the same direction. When it has a negative value, it means that the stock and market are moving in the opposite direction. When the beta equals zero, the fund has no relationship with the market.

The beta value of the selected growth schemes has been presented in table below.

**Table 3:** Beta of the selected schemes and benchmark

Sl. No.	Schemes	Beta ( $\beta$ )
		$\frac{\sum(R_m - \bar{R}_m)(R_p - \bar{R}_p)}{\sum(R_m - \bar{R}_m)^2}$
1	Axis Blue chip Fund Direct Plan Growth	1.05
2	Axis Mid cap Direct Plan Growth	1.72
3	Kotak Small cap Fund Direct Growth	3.08
4	Kotak Emerging Equity Fund Direct Growth	2.43
5	Nippon India Small cap Fund Direct Growth	3.89
6	Nippon India Pharma Fund Direct Growth	0.33
7	HDFC Small cap Fund Direct Growth	3.47
8	HDFC Mid cap Opportunities Direct Plan Growth	2.40
9	SBI Small cap Fund Direct growth	3.84
10	SBI Technology Opportunities Fund Direct Growth	0.60
11	ICICI Prudential Technology Direct Plan Growth	0.40
12	ICICI Prudential Small cap Fund Direct Plan Growth	3.07
13	UTI Midcap Fund Direct Growth	2.50
14	UTI Flexi cap Fund Direct Growth	1.22
15	IDFC Sterling Value Fund Direct Growth Fund	3.60
16	IDFC Tax Advantage Direct Plan Growth	2.82
17	DSP Small cap Direct Plan Growth	3.17
18	DSP Tax Saver Direct Plan Growth	1.88
19	Aditya Birla Sun Life Digital India Fund Direct Growth	1.17
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	1.56
	Nifty 50	1.00

Source: Data Analysis

**Interpretation:**

The table illustrates the volatility, measured in terms of beta, for the selected schemes and the market. The market's beta is consistently set at 1. Notably, only three schemes—Nippon India Pharma Fund Direct Growth (0.33), SBI Technology Opportunities Fund Direct Growth (0.60), and ICICI Prudential Technology Direct Plan Growth (0.40)—display lower volatility than the market. On the other hand, Nippon India Small Cap Fund Direct Growth (3.89) exhibits the highest volatility, signifying an aggressive nature, while Nippon India Pharma Fund Direct Growth (0.33) is identified as having the lowest volatility, characterizing a defensive stance.

**Sharpe Performance Index:**

The Sharpe Ratio assesses the surplus return of a fund in relation to its risk, considering total risk. This ratio demonstrates the connection between a portfolio's excess return over its risk-free return and its overall risk, evaluated in terms of standard deviation. Presented below are the Sharpe Ratios for all the selected mutual fund schemes, including rankings and a comparison with the benchmark portfolio

**Table 4:** Sharpe ratios of the selected schemes and benchmark and Ranking

S.No.	Schemes	Sharpe ratio	Rank
1	Axis Blue chip Fund Direct Plan Growth	1.5	1
2	Axis Midcap Direct Plan Growth	1.23	3
3	Kotak Small cap Fund Direct Growth	0.7	10
4	Kotak Emerging Equity Fund Direct Growth	0.75	9
5	Nippon India Small cap Fund Direct Growth	0.65	13
6	Nippon India Pharma Fund Direct Growth	0.62	15
7	HDFC Small cap Fund Direct Growth	0.612	17
8	HDFC Midcap Opportunities Direct Plan Growth	0.615	16
9	SBI Small cap Fund Direct growth	0.66	12
10	SBI Technology Opportunities Fund Direct Growth	1.16	5
11	ICICI Prudential Technology Direct Plan Growth	0.79	8
12	ICICI Prudential Small cap Fund Direct Plan Growth	0.6	18
13	UTI Midcap Fund Direct Growth	0.63	14
14	UTI Flexi cap Fund Direct Growth	1.31	2
15	IDFC Sterling Value Fund Direct Growth Fund	0.56	19
16	IDFC Tax Advantage Direct Plan Growth	0.69	11
17	DSP Small cap Direct Plan Growth	0.52	20
18	DSP Tax Saver Direct Plan Growth	0.82	7
19	Aditya Birla Sun Life Digital India Fund Direct Growth	1.17	4
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	0.83	6
	Nifty 50 benchmark	1.14	-

Source: Data Analysis

**Interpretation:**

A higher Sharpe ratio indicates superior fund performance, with negative values signifying lower returns and poorer performance compared to the market. In the table, only five schemes—Axis Blue Chip Fund Direct Plan Growth (1.50),

UTI Flexi Cap Fund Direct Growth (1.31), Axis Midcap Direct Plan Growth (1.23), Aditya Birla Sun Life Digital India Fund Direct Growth (1.17), and SBI Technology Opportunities Fund Direct Growth (1.16)—demonstrate better performance, while all other funds underperform relative to the market. Further analysis reveals that Axis Blue Chip Fund Direct Plan Growth boasts the highest Sharpe ratio of 1.50 throughout the study period, leading the top five list, followed by UTI Flexi Cap Fund Direct Growth (1.31), Axis Midcap Direct Plan Growth (1.23), Aditya Birla Sun Life Digital India Fund Direct Growth (1.17), and SBI Technology Opportunities Fund Direct Growth (1.16). Conversely, DSP Small Cap Direct Plan Growth lags behind with a Sharpe ratio of 0.52, indicating relatively poor performance compared to the other schemes.

**Treynor’s Performance Index:**

The index's main goal was to use beta as the risk metric to calculate the excess return on a portfolio per unit of risk. Below are the findings of the Treynor Ratios for the chosen mutual fund schemes of all the selected schemes with the benchmark portfolio and the rankings.

**Table 5:** Treynor ratios of the selected schemes and benchmark and Ranking

S. No.	Schemes	Treynor ratio	Rank
1	Axis Blue chip Fund Direct Plan Growth	16.77	5
2	Axis Midcap Direct Plan Growth	12.59	7
3	Kotak Small cap Fund Direct Growth	7.77	10
4	Kotak Emerging Equity Fund Direct Growth	7.69	11
5	Nippon India Small cap Fund Direct Growth	6.82	14
6	Nippon India Pharma Fund Direct Growth	51.87	2
7	HDFC Small cap Fund Direct Growth	6.57	16
8	HDFC Midcap Opportunities Direct Plan Growth	5.44	20
9	SBI Small cap Fund Direct growth	6.78	15
10	SBI Technology Opportunities Fund Direct Growth	46.08	3
11	ICICI Prudential Technology Direct Plan Growth	73.93	1
12	ICICI Prudential Small cap Fund Direct Plan Growth	6.41	17
13	UTI Midcap Fund Direct Growth	6.83	13
14	UTI Flexi cap Fund Direct Growth	15.17	6
15	IDFC Sterling Value Fund Direct Growth Fund	5.91	18
16	IDFC Tax Advantage Direct Plan Growth	6.99	12
17	DSP Small cap Direct Plan Growth	5.86	19
18	DSP Tax Saver Direct Plan Growth	8.23	9
19	Aditya Birla Sun Life Digital India Fund Direct Growth	27.3	4
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	8.3	8
	Nifty 50 benchmark	11.39	-

Source: Data Analysis

**Interpretation:**

A high and positive Treynor ratio shows that a fund has improved risk-adjusted performance, while a negative value that results from low return generation compared to risk-free rate indicates that the fund has performed poorly. If the fund's negativity is caused by a negative beta value,

however, the fund has outperformed the market. Seven schemes are performed better as compared to the market in terms of Treynor ratio they are- Aditya Birla Sun Life Digital India Fund Direct Growth (27.30), Axis Blue chip Fund Direct Plan Growth (16.77), Axis Midcap Direct Plan Growth (12.59), Nippon India Pharma Fund Direct Growth (51.87), SBI Technology Opportunities Fund Direct Growth (46.08), ICICI Prudential Technology Direct Plan Growth (73.93) and UTI Flexi cap Fund Direct Growth (15.17). All other thirteen schemes are performing poorly compared to the market.

On analysis it is found that, ICICI Prudential Technology Direct Plan Growth is outperformed the market as compared to the other selected schemes in terms of Treynor ratio with having ratio of 73.93. HDFC Midcap Opportunities Direct Plan Growth is poorly performed in the market as compared to the selected schemes having Treynor ratio of 5.44.

**Jensen’s Performance Index:**

It is also known as Jensen’s Alpha. A portfolio’s excess return over its needed return, or expected return, for the expected risk indicated by its beta, is represented by a coefficient known as alpha. In contrast to beta, which gauges the portfolio’s return based on its volatility, alpha is calculated by the underlying values of the firms in the portfolio. Below are the findings of the Jensen Alpha for the chosen mutual fund schemes of all the selected schemes with the benchmark portfolio and the rankings.

**Table 6:** Jensen alpha of the selected schemes and Ranking

S. No.	Schemes	Jensen Alpha	Rank
1	Axis Blue chip Fund Direct Plan Growth	5.67	5
2	Axis Midcap Direct Plan Growth	2.07	7
3	Kotak Small cap Fund Direct Growth	-11.16	11
4	Kotak Emerging Equity Fund Direct Growth	-9	10
5	Nippon India Small cap Fund Direct Growth	-17.8	19
6	Nippon India Pharma Fund Direct Growth	13.31	4
7	HDFC Small cap Fund Direct Growth	-16.71	16
8	HDFC Midcap Opportunities Direct Plan Growth	-12.15	13
9	SBI Small cap Fund Direct growth	-17.7	18
10	SBI Technology Opportunities Fund Direct Growth	20.72	2
11	ICICI Prudential Technology Direct Plan Growth	25.06	1
12	ICICI Prudential Small cap Fund Direct Plan Growth	-15.29	15
13	UTI Midcap Fund Direct Growth	-11.42	12
14	UTI Flexi cap Fund Direct Growth	4.6	6
15	IDFC Sterling Value Fund Direct Growth Fund	-19.73	20
16	IDFC Tax Advantage Direct Plan Growth	-12.41	14
17	DSP Small cap Direct Plan Growth	-17.56	17
18	DSP Tax Saver Direct Plan Growth	-5.94	9
19	Aditya Birla Sun Life Digital India Fund Direct Growth	18.6	3
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	-4.82	8

Source: Data Analysis

**Interpretation:**

A negative value for the Jensen alpha proves to be a bad performer. Positive alpha value reveals that the fund has earned a better return as compared to the market. Seven schemes are better performed the market. They are- ICICI Prudential Technology Direct Plan Growth (25.06), SBI Technology Opportunities Fund Direct Growth (20.72), Aditya Birla Sun Life Digital India Fund Direct Growth (18.60), Nippon India Pharma Fund Direct Growth (13.31), Axis Blue Chip Fund Direct Plan Growth (5.67), UTI Flexi cap Fund Direct Growth (4.60) and Axis Midcap Direct Plan Growth (2.07).

It is found that, ICICI Prudential Technology Direct Plan Growth has outperformed the market as compared to the other selected schemes with the alpha of 25.06 and IDFC Sterling Value Fund Direct Growth Fund is proved to be a bad performer as compared to the other selected schemes with alpha of -19.73.

**Fama Performance Index:**

A positive score for  $F_p$  means the fund outperformed expectations and is above CML, while a negative value means the fund underperformed expectations and is below CML. Below are the findings of the Fama index for the chosen mutual fund schemes of all the selected schemes with the benchmark portfolio and the rankings.

**Table 7:** Fama index of the selected schemes and Ranking

S. No.	Schemes	Fama Index	Rank
1	Axis Blue chip Fund Direct Plan Growth	4.22	1
2	Axis Midcap Direct Plan Growth	1.52	3
3	Kotak Small cap Fund Direct Growth	-15.22	14
4	Kotak Emerging Equity Fund Direct Growth	-9.75	8
5	Nippon India Small cap Fund Direct Growth	-20.26	18
6	Nippon India Pharma Fund Direct Growth	-14.48	13
7	HDFC Small cap Fund Direct Growth	-19.67	17
8	HDFC Midcap Opportunities Direct Plan Growth	-12.99	10
9	SBI Small cap Fund Direct growth	-18.78	16
10	SBI Technology Opportunities Fund Direct Growth	0.41	5
11	ICICI Prudential Technology Direct Plan Growth	-12.91	9
12	ICICI Prudential Small cap Fund Direct Plan Growth	-17.9	15
13	UTI Midcap Fund Direct Growth	-14.05	12
14	UTI Flexi cap Fund Direct Growth	2.38	2
15	IDFC Sterling Value Fund Direct Growth Fund	-21.72	19
16	IDFC Tax Advantage Direct Plan Growth	-13.08	11
17	DSP Small cap Direct Plan Growth	-22.07	20
18	DSP Tax Saver Direct Plan Growth	-6.15	7
19	Aditya Birla Sun Life Digital India Fund Direct Growth	0.73	4
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	-4.85	6

Source: Data Analysis

**Interpretation:**

Table represents the performance of the selected schemes. Only five schemes are showing the positive value that means they outperformed the market. They are- Aditya Birla Sun Life Digital India Fund Direct Growth (0.73), Axis Blue chip Fund Direct Plan Growth (4.22), Axis Midcap Direct

Plan Growth (1.52), SBI Technology Opportunities Fund Direct Growth (0.41) and UTI Flexi cap Fund Direct Growth (2.38).

The analysis shows that Axis Blue chip Fund Direct Plan Growth is best performer as compared to the other selected schemes with the score of 4.22 and DSP Small cap Direct Plan Growth is the poor performer with the negative score of -22.07.

**M<sup>2</sup> Measure:**

The M<sup>2</sup> measure can be used to rank portfolios as well as identify which portfolios outperformed the market on a risk-adjusted basis. The M<sup>2</sup> performance measure expresses the relative performance in risk adjusted basis points. Below are the findings of the relative risk-adjusted returns for the chosen mutual fund schemes of all the selected schemes with the benchmark portfolio and the performance analysis.

**Table 8:** Relative Risk-adjusted return of the selected schemes and Ranking

Sl. No.	Schemes	R <sub>adj</sub>	Analysis
1	Axis Blue chip Fund Direct Plan Growth	19.94	Above Average
2	Axis Midcap Direct Plan Growth	17.22	Above Average
3	Kotak Small cap Fund Direct Growth	11.93	Below Average
4	Kotak Emerging Equity Fund Direct Growth	12.46	Below Average
5	Nippon India Small cap Fund Direct Growth	11.43	Below Average
6	Nippon India Pharma Fund Direct Growth	11.13	Below Average
7	HDFC Small cap Fund Direct Growth	11.08	Below Average
8	HDFC Midcap Opportunities Direct Plan Growth	11.11	Below Average
9	SBI Small cap Fund Direct growth	11.59	Below Average
10	SBI Technology Opportunities Fund Direct Growth	16.54	Above Average
11	ICICI Prudential Technology Direct Plan Growth	12.9	Below Average
12	ICICI Prudential Small cap Fund Direct Plan Growth	10.94	Below Average
13	UTI Midcap Fund Direct Growth	11.22	Below Average
14	UTI Flexi cap Fund Direct Growth	18.04	Above Average
15	IDFC Sterling Value Fund Direct Growth Fund	10.61	Below Average
16	IDFC Tax Advantage Direct Plan Growth	11.82	Below Average
17	DSP Small cap Direct Plan Growth	10.18	Below Average
18	DSP Tax Saver Direct Plan Growth	13.13	Below Average
19	Aditya Birla Sun Life Digital India Fund Direct Growth	15.29	Below Average
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	14.65	Below Average
	Nifty 50 benchmark	16.36	Market Average

Source: Data Analysis

**Interpretation:**

The table represents the performance of the selected schemes comparing with the benchmark returns. Only four schemes i.e., UTI Flexi cap Fund Direct Growth (18.04), SBI Technology Opportunities Fund Direct Growth (16.54), Axis Blue Chip Fund Direct Plan Growth (19.94) and Axis Midcap Direct Plan Growth (17.22) are performed above of

market average (16.36) and all other schemes performed below average. Axis Blue Chip Fund Direct Plan Growth (19.94) performed best in market.

Below table shows the M<sup>2</sup> measure and ranking of the selected mutual funds.

**Table 9:** M<sup>2</sup> measure of selected schemes and Ranking

Sl. No.	Schemes	M <sup>2</sup>	Rank
1	Axis Blue chip Fund Direct Plan Growth	3.58	1
2	Axis Midcap Direct Plan Growth	0.86	3
3	Kotak Small cap Fund Direct Growth	-4.43	10
4	Kotak Emerging Equity Fund Direct Growth	-3.9	9
5	Nippon India Small cap Fund Direct Growth	-4.93	13
6	Nippon India Pharma Fund Direct Growth	-5.23	15
7	HDFC Small cap Fund Direct Growth	-5.28	17
8	HDFC Midcap Opportunities Direct Plan Growth	-5.25	16
9	SBI Small cap Fund Direct growth	-4.77	12
10	SBI Technology Opportunities Fund Direct Growth	0.17	4
11	ICICI Prudential Technology Direct Plan Growth	-3.46	8
12	ICICI Prudential Small cap Fund Direct Plan Growth	-5.42	18
13	UTI Midcap Fund Direct Growth	-5.14	14
14	UTI Flexi cap Fund Direct Growth	1.68	2
15	IDFC Sterling Value Fund Direct Growth Fund	-5.75	19
16	IDFC Tax Advantage Direct Plan Growth	-4.55	11
17	DSP Small cap Direct Plan Growth	-6.18	20
18	DSP Tax Saver Direct Plan Growth	-3.23	7
19	Aditya Birla Sun Life Digital India Fund Direct Growth	-1.07	5
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	-1.71	6

Source: Data Analysis

**Interpretation:**

The table presents the mutual funds' performance based on M2 measures. Notably, only four schemes, namely Axis Blue Chip Fund Direct Plan Growth (3.58), Axis Midcap Direct Plan Growth (0.86), SBI Technology Opportunities Fund Direct Growth (0.17), and UTI Flexi Cap Fund Direct Growth (1.68), exhibit positive values. Among these, Axis

Blue Chip Fund Direct Plan Growth stands out as the top performer with an M2 measure of 3.58. On the contrary, DSP Small Cap Direct Plan Growth (-6.18) is identified as a poor performer compared to the other selected schemes. This analysis provides valuable insights into the funds' relative performance, with Axis Blue Chip Fund Direct Plan demonstrating superior results.

**Table 10:** Consolidated table: 2017-2021

Sl. No.	Schemes	Sharpe	Treynor	Jensen	Fama	M <sup>2</sup>	Rank
		S <sub>p</sub>	T <sub>p</sub>	α	F <sub>p</sub>	R <sub>rap</sub> -R <sub>m</sub>	
1	Axis Blue chip Fund Direct Plan Growth	1.50	16.77	5.67	4.22	3.58	1
2	Axis Midcap Direct Plan Growth	1.23	12.59	2.07	1.52	0.86	5
3	Kotak Small cap Fund Direct Growth	0.70	7.77	-11.16	-15.22	-4.43	11
4	Kotak Emerging Equity Fund Direct Growth	0.75	7.69	-9.00	-9.75	-3.90	9
5	Nippon India Small cap Fund Direct Growth	0.65	6.82	-17.80	-20.26	-4.93	16
6	Nippon India Pharma Fund Direct Growth	0.62	51.87	13.31	-14.48	-5.23	10
7	HDFC Small cap Fund Direct Growth	0.612	6.57	-16.71	-19.67	-5.28	17
8	HDFC Midcap Opportunities Direct Plan Growth	0.615	5.44	-12.15	-12.99	-5.25	15
9	SBI Small cap Fund Direct growth	0.66	6.78	-17.70	-18.78	-4.77	14
10	SBI Technology Opportunities Fund Direct Growth	1.16	46.08	20.72	0.41	0.17	3
11	ICICI Prudential Technology Direct Plan Growth	0.79	73.93	25.06	-12.91	-3.46	6
12	ICICI Prudential Small cap Fund Direct Plan Growth	0.60	6.41	-15.29	-17.90	-5.42	18
13	UTI Midcap Fund Direct Growth	0.63	6.83	-11.42	-14.05	-5.14	13
14	UTI Flexi cap Fund Direct Growth	1.31	15.17	4.60	2.38	1.68	2
15	IDFC Sterling Value Fund Direct Growth Fund	0.56	5.91	-19.73	-21.72	-5.75	19
16	IDFC Tax Advantage Direct Plan Growth	0.69	6.99	-12.41	-13.08	-4.55	12
17	DSP Small cap Direct Plan Growth	0.52	5.86	-17.56	-22.07	-6.18	20
18	DSP Tax Saver Direct Plan Growth	0.82	8.23	-5.94	-6.15	-3.23	8
19	Aditya Birla Sun Life Digital India Fund Direct Growth	1.17	27.30	18.60	0.73	-1.07	4
20	Aditya Birla Sun Life Flexi Cap Fund Direct Growth	0.83	8.30	-4.82	-4.85	-1.71	7
	Nifty 50	1.14	11.39	0			

Source: Data Analysis

**Interpretation:**

Over the five-year study period from 2017 to 2021, Axis Blue Chip Fund Direct Plan Growth emerged as the top performer, showcasing exceptional results. On the other hand, DSP Small Cap Direct Plan Growth exhibited poor performance throughout the five years. Notably, the top five performing schemes among the twenty selected ones include Axis Blue Chip Fund Direct Plan Growth, Aditya Birla Sun Life Digital India Fund Direct Growth, Axis Midcap Direct Plan Growth, SBI Technology Opportunities Fund Direct Growth, and UTI Flexi Cap Fund Direct Growth. These findings offer valuable insights into the consistent performance of these funds over the specified duration.

The analysis involved the measurement of performance against benchmark. Most of the schemes outperformed the benchmark index Nifty 50, indicating a positive relationship between fund returns and standard deviation. The study period from 2017 to 2021 revealed that, particularly in 2020 and 2021, all schemes surpassed the benchmark, with Axis Blue Chip Fund Direct Plan Growth demonstrating outstanding performance, securing the top position in returns, Sharpe ratio, Treynor ratio, Alpha measure, Fama measure, and M2 measure. The Sharpe ratio analysis revealed that Axis Blue Chip Fund Direct Plan Growth led with the highest Sharpe ratio of 1.50 during the study period, followed by UTI Flexi Cap Fund Direct

Growth (1.31), Axis Midcap Direct Plan Growth (1.23), Aditya Birla Sun Life Digital India Fund Direct Growth (1.17), and SBI Technology Opportunities Fund Direct Growth (1.16). As per Treynor ratio ICICI Prudential Technology Direct Plan Growth outperformed the market (73.93), followed by Nippon India Pharma Fund Direct Growth (51.87), SBI Technology Opportunities Fund Direct Growth (46.08), Aditya Birla Sun Life Digital India Fund Direct Growth (27.30), and Axis Blue Chip Fund Direct Plan Growth (16.77). Jensen's Alpha Evaluation reveals that ICICI Prudential Technology Direct Plan Growth demonstrated superior performance with an alpha value of 25.06, followed by SBI Technology Opportunities Fund Direct Growth (20.72), Aditya Birla Sun Life Digital India Fund Direct Growth (18.60), Nippon India Pharma Fund Direct Growth (13.31), and Axis Blue Chip Fund Direct Plan Growth (5.67). Fama Performance Index shows that Axis Blue Chip Fund Direct Plan Growth emerged as the best performer with a Fama index score of 4.22, followed by UTI Flexi Cap Fund Direct Growth (2.38), Axis Midcap Direct Plan Growth (1.52), Aditya Birla Sun Life Digital India Fund Direct Growth (0.73), and SBI Technology Opportunities Fund Direct Growth (0.41). M2 Measure Ranking reveals that Axis Blue Chip Fund Direct Plan Growth secured the top position with an M2 measure of 3.58, followed by UTI Flexi Cap Fund Direct Growth (1.68), Axis Midcap Direct Plan Growth (0.86), SBI Technology



Opportunities Fund Direct Growth (0.17), and Aditya Birla Sun Life Digital India Fund Direct Growth (-1.07). In summary, Axis Blue Chip Fund Direct Plan demonstrated outstanding performance across various measures, making it a suitable choice for investors seeking high returns with a moderate level of risk.

## 6. Conclusion

In conclusion, this study delved into the nature of investments, emphasizing that investment involves trading present value for an uncertain future reward. Mutual funds, acting as investment vehicles, offer simplicity and professional management, along with diversification benefits. The study recognized risk as an inherent aspect of investment, presenting itself in various forms such as market performance and financial sector fluctuations. The mutual fund industry's reliance on stock market performance was acknowledged, with returns being contingent on market outcomes. Evaluating the risk-adjusted performance of twenty equity funds from the top ten Asset Management Companies (AMCs) over a five-year period (2017-2021), the study employed statistical tools like standard deviation, beta, Sharpe ratio, Treynor ratio, Jensen's alpha, Fama index, and M2 measures. Notably, during the 2018 market crash, some schemes demonstrated resilience and outperformed the benchmark index. Axis Blue Chip Fund Direct Plan Growth and UTI Flexi Cap Fund Direct Growth emerged as the top-performing schemes based on various risk-adjusted measures. The study provided investors with insights for informed decision-making, emphasizing the need for thorough research before investing, given the dynamic nature of financial markets. Ultimately, Axis Blue Chip Fund Direct Plan Growth and UTI Flexi Cap Fund Direct Growth were recommended as the preferred options among the selected equity funds. The study concluded by highlighting the significance of understanding returns and risks associated with schemes, aiming to aid investors in making well-informed and satisfying investment decisions.

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