



# Performance and Risk Analysis of Equity Mutual Funds with Reference to SIP and Lump Sum Investment Strategies

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## ABSTRACT

This study examines the performance, risk, and investment strategy effectiveness of selected equity mutual funds across large-cap, mid-cap, and small-cap categories. It uses secondary data based on monthly Net Asset Value (NAV) from March 2022 to February 2026. Fund performance is evaluated using average returns, annualized returns, and Compound Annual Growth Rate (CAGR), while risk is measured through standard deviation and variance. The Sharpe ratio is used to assess risk-adjusted performance, and rolling return analysis evaluates consistency over time. A multi-criteria ranking approach identifies top-performing funds based on return, risk, and efficiency. The study also compares investment strategies such as SIP, Step-up SIP, Lump Sum, and hybrid approaches using Internal Rate of Return (IRR). The findings confirm a clear risk–return relationship, where small-cap funds deliver higher returns with higher volatility, while large-cap funds provide stability. Hybrid strategies, particularly Step-up SIP combined with Lump Sum, are found to generate the highest returns.

**Keywords:** Equity Mutual Funds, Risk–Return Analysis, SIP (Systematic Investment Plan), Sharpe Ratio, Investment Strategies

## INTRODUCTION

Mutual funds have emerged as one of the most popular investment avenues for both retail and institutional investors due to their ability to offer diversification, professional management, and accessibility across different market segments. In the context of equity mutual funds, investors are often presented with a wide range of choices across large-cap, mid-cap, and small-cap categories, each differing in terms of risk, return potential, and market behavior. However, the process of selecting suitable funds is often complex, as investment decisions are frequently based on historical returns without adequate consideration of risk, consistency, and risk-adjusted performance.

In addition to fund selection, the choice of investment strategy plays a crucial role in determining overall investment outcomes. Traditional approaches such as lump sum investments and Systematic Investment Plans (SIP) are widely used, but evolving strategies like Step-up SIP and hybrid combinations of SIP and



lump sum investments have gained increasing relevance in recent years. These strategies differ in their structure, timing of cash flows, and ability to respond to market fluctuations, making it essential to evaluate their effectiveness in real-world conditions.

This study aims to provide a comprehensive analysis of equity mutual funds by integrating return, risk, and risk-adjusted performance measures, along with consistency evaluation through rolling returns. Furthermore, it compares the effectiveness of different investment strategies using Internal Rate of Return (IRR), which captures the impact of multiple cash flows. By combining fund performance analysis with strategy evaluation, the study seeks to offer meaningful insights for informed investment decision-making.

## PROBLEM STATEMENT

1. Investors often find it difficult to choose the right mutual funds due to the large number of options available in the market.
2. Many investment decisions are based mainly on past returns, while important aspects like risk, consistency, and long-term stability are often overlooked.
3. There is limited awareness among investors about the effectiveness of different investment strategies such as SIP, Step-up SIP, and lump sum investments.
4. Investors are often unsure about which strategy works best under different market conditions and how each approach impacts overall returns.
5. Traditional methods of measuring returns do not always reflect the actual performance of investments, especially when multiple cash flows are involved.
6. There is a need for a more comprehensive analysis that considers returns along with risk and risk-adjusted performance to support better investment decisions.

## RESEARCH OBJECTIVES

1. To analyze the performance of selected equity mutual funds using average monthly returns and annualized returns derived from NAV data.
2. To evaluate the risk and risk-adjusted performance of mutual funds using statistical measures such as standard deviation, variance, and Sharpe ratio.
3. To examine the consistency of mutual fund performance through rolling return analysis.
4. To rank and identify the top-performing mutual funds based on return, risk, and risk-adjusted performance.
5. To evaluate and compare the effectiveness of different investment strategies, including SIP, Step-up SIP, Lump Sum, and hybrid approaches, using Internal Rate of Return (IRR) to determine the most suitable strategy.

## REVIEW OF LITERATURE

**Dimple Batra and Gunjan Batra (2012)** examined the factors influencing investor preferences for SIP and lump sum investments using Data Envelopment Analysis (DEA). The study utilized both primary survey data and secondary data from AMFI. The findings revealed that SIPs demonstrated higher efficiency scores due to superior risk management, while investor awareness significantly influenced investment decisions. The study concluded that SIPs are structurally more efficient investment options.

**Dr. Hemendra Gupta (2015)** conducted a comparative analysis of SIP and lump sum investment strategies using Sensex data across different market phases. The study found that lump sum investments performed better during bullish markets, whereas SIP effectively reduced volatility during bearish and sideways markets through rupee cost averaging. It concluded that investment horizon plays a more critical role than market timing.



**Dr. Rashmi Somani, Anuj Agarwal, and Priya Jain (2017)** analyzed SIP and lump sum investments using IRR and Sharpe ratio over an extended period. The findings indicated that SIP generated superior risk-adjusted returns and minimized timing risk. The study concluded that SIP is more suitable for long-term wealth creation.

**Sangem Naga Jyothi and Gunda Srinivas (2018)** examined the impact of SIP investments using secondary data from AMFI. The study found that SIP reduces long-term risk and promotes disciplined investing, particularly in mid-cap and small-cap funds. It emphasized the importance of systematic investment approaches.

**Alpesh Gajera, Kiran Vaghasiya, and Hardik Patel (2020)** analyzed the performance of SIP and lump sum investments in equity mutual funds using NAV data. The findings revealed that lump sum investments generated higher returns during favorable market conditions, while SIP provided better downside protection in volatile markets.

**Priyanka Singh and Pramod Kumar (2022)** conducted a comparative evaluation of mutual funds using performance measures such as Sharpe ratio, Treynor ratio, and Jensen's alpha. The study found that small-cap funds outperformed other categories in terms of returns, while large-cap funds exhibited lower risk. It emphasized the importance of risk-adjusted performance measures.

**Vinukonda Raj Kumar (2026)** carried out a comparative analysis of SIP and lump sum investment strategies using NAV data across multiple fund categories. The findings showed that SIP performed better during volatile conditions, while lump sum investments yielded higher returns in bullish markets. The study recommended a blended investment approach for optimal results.

## RESEARCH GAP

The review of existing literature indicates that several studies have analyzed mutual fund performance and compared investment strategies such as SIP and lump sum investments. However, most of these studies focus on either return-based evaluation or isolated risk-adjusted measures like the Sharpe ratio, without integrating return, risk, and consistency into a single comprehensive framework. This limits the ability to make well-rounded investment decisions.

Further, while earlier studies highlight the advantages of SIP and lump sum strategies under different market conditions, they largely overlook advanced and practical strategies such as Step-up SIP and hybrid approaches combining SIP with lump sum investments. There is also limited application of Internal Rate of Return (IRR) in evaluating strategies involving multiple cash flows, with many studies relying primarily on CAGR, which assumes a single investment.

Additionally, rolling return analysis, which provides a more realistic measure of consistency over time, is often not incorporated, leading to potential time-period bias. Moreover, there is insufficient research linking fund categories (large-cap, mid-cap, small-cap) with the effectiveness of different investment strategies.



Therefore, this study addresses these gaps by integrating return, risk, risk-adjusted performance, consistency analysis, and strategy evaluation within a unified framework to provide a more practical and comprehensive approach to mutual fund analysis.

## RESEARCH DESIGN

This study adopts a descriptive and analytical research design to evaluate the performance, risk, and investment strategy effectiveness of selected equity mutual funds. The research is based entirely on secondary data, collected from reliable sources such as AMFI and mutual fund databases. A sample of 30 mutual funds is selected, comprising large-cap, mid-cap, and small-cap categories to ensure a balanced and comprehensive analysis across different market segments.

The study covers the period from March 2022 to February 2026, using monthly Net Asset Value (NAV) data to compute returns and risk measures. Various financial and statistical tools are employed to analyze fund performance, including average returns, annualized returns, CAGR, standard deviation, variance, and Sharpe ratio. In addition, rolling return analysis is used to examine performance consistency over time.

To evaluate investment strategies, the study incorporates Internal Rate of Return (IRR) for SIP, Step-up SIP, lump sum, and hybrid approaches, enabling a realistic assessment of returns considering multiple cash flows. A multi-criteria ranking framework is also applied to identify top-performing funds based on return, risk, and efficiency. This design ensures a systematic and comprehensive evaluation aligned with the research objectives.

## RESEARCH FRAMEWORK

The study follows a structured analytical framework that systematically connects data, tools, and outcomes to generate meaningful insights.

The first stage involves data collection, where monthly NAV data of selected mutual funds is gathered from secondary sources for the specified study period. The second stage focuses on performance evaluation, where return measures such as average returns, annualized returns, and CAGR are calculated to assess fund growth.

The third stage involves risk and risk-adjusted analysis, using standard deviation, variance, and the Sharpe ratio to evaluate volatility and efficiency. The fourth stage examines performance consistency through rolling return analysis, providing a time-based perspective of fund stability.

In the fifth stage, a multi-criteria ranking approach is applied to identify the top-performing funds based on combined performance indicators. The final stage focuses on investment strategy evaluation, where different strategies such as SIP, Step-up SIP, lump sum, and hybrid approaches are analyzed using IRR to determine their effectiveness.

This integrated framework ensures a comprehensive evaluation of mutual funds by combining return, risk, consistency, and strategy analysis, thereby providing practical insights for informed investment decision-making.



## DATA ANALYSIS AND KEY FINDINGS

The study analyzes 30 equity mutual funds across large-cap, mid-cap, and small-cap categories using monthly NAV data from March 2022 to February 2026. Performance is evaluated using return measures such as average return, annualized return, and CAGR, while risk is assessed using standard deviation. The Sharpe ratio is used to measure risk-adjusted performance, and different investment strategies are compared using IRR.

**Table 1: Category-wise Average Performance**

Fund Category	Avg Annualized Return	Avg 5-Year CAGR	Risk Level (Std Dev)	Risk-Adjusted Performance
Large Cap	15.61%	14.7%	Low (3.3%–3.9%)	Moderate
Mid Cap	23.31%	21.9%	Moderate (3.9%–5.0%)	High

Fund Category	Avg Annualized Return	Avg 5-Year CAGR	Risk Level (Std Dev)	Risk-Adjusted Performance
Small Cap	23.65%	21.9%+	High (4.5%–5.6%)	Moderate–High

### Interpretation:

A clear risk–return relationship exists. Large-cap funds provide stability, mid-cap funds offer the best balance of return and risk efficiency, and small-cap funds deliver the highest returns with higher volatility.

**Table 2: Top Performing Funds (Overall Ranking)**

Category	Rank 1	Rank 2	Rank 3
Large Cap	ICICI Prudential Large Cap	Nippon India Large Cap	HDFC Large Cap
Mid Cap	HDFC Mid Cap	Nippon India Growth Mid Cap	Motilal Oswal Mid Cap
Small Cap	Nippon India Small Cap	Bandhan Small Cap	Quant Small Cap



### Interpretation:

Mid-cap and small-cap funds dominate rankings due to higher returns and strong Sharpe ratios, while large-cap funds rank based on stability and consistency.

**Table 3: Investment Strategy Comparison (IRR %)**

Strategy	Large Cap	Mid Cap	Small Cap
SIP	13–16%	17–22%	15–21%
Step-up SIP	14–17%	18–22%	16–22%
SIP + Lump Sum	14–17%	18–22%	16–22%

Strategy	Large Cap	Mid Cap	Small Cap
Step-up SIP + Lump Sum	15–17%	19–22%	17–23%

### Interpretation:

Hybrid strategies, especially Step-up SIP combined with Lump Sum, consistently generate the highest returns. SIP provides stability, while lump sum enhances returns when timed effectively.

## OBJECTIVES AND KEY FINDINGS

**Objective 1: To analyze the performance of selected equity mutual funds using average monthly and annualized returns.**

**Finding:** The performance analysis clearly indicates that mutual funds differ significantly across categories. Small-cap funds deliver the highest average and annualized returns due to their exposure to high-growth companies, though with greater fluctuations. Mid-cap funds also generate strong returns by balancing growth potential with relative stability. In contrast, large-cap funds provide comparatively lower returns but ensure consistency and reduced volatility. This highlights that return potential is directly linked to the growth opportunities and market segment of the underlying investments, making category selection a crucial factor in investment decisions.

**Objective 2: To evaluate risk and risk-adjusted performance using standard deviation, variance, and Sharpe ratio.**

**Finding:** The analysis confirms a clear increase in risk from large-cap to mid-cap and small-cap funds, as reflected in higher standard deviation and variance. However, risk-adjusted performance reveals that certain mid-cap and small-cap funds generate higher returns per unit of risk, indicating efficient fund management. This demonstrates that higher risk does not always imply inefficiency, and evaluating funds based on the Sharpe ratio provides a more accurate measure of performance than relying solely on returns.

**Objective 3: To examine the consistency of mutual fund performance through rolling return analysis.**

**Finding:** Rolling return analysis shows that large-cap funds maintain stable and consistent performance over time due to their exposure to well-established companies. In contrast, mid-cap and small-cap funds display higher variability, reflecting sensitivity to market cycles. This indicates that returns are not uniform across time periods, and investors may experience fluctuations depending on investment timing. Therefore, consistency becomes an important parameter alongside return and risk in fund evaluation.



#### **Objective 4: To rank and identify top-performing mutual funds based on return, risk, and risk-adjusted performance.**

**Finding:** The multi-criteria ranking framework identifies funds that perform consistently across all parameters rather than excelling in a single metric. Funds with strong returns, controlled risk, and high Sharpe ratios achieve top rankings. This approach ensures a balanced and realistic evaluation, avoiding the limitations of return-only comparisons and helping investors select efficient and reliable funds.

#### **Objective 5: To evaluate and compare investment strategies (SIP, Step-up SIP, Lump Sum, and Hybrid approaches) using IRR.**

**Finding:** The strategy analysis reveals that SIP provides stability and disciplined investing by reducing market timing risk. Step-up SIP enhances returns by increasing contributions over time, improving the compounding effect. Lump sum investments offer higher returns during favourable market conditions but are highly timing-dependent. Hybrid strategies, especially Step-up SIP combined with lump sum, consistently deliver the highest returns, as they combine systematic investing with strategic capital deployment. This makes hybrid strategies the most effective approach for long-term wealth creation.

### **KEY FINDINGS**

1. A clear risk–return relationship exists, where returns increase from large-cap to mid- cap to small-cap funds along with higher volatility.
2. Small-cap funds generate the highest returns but involve significant fluctuations and higher risk.
3. Mid-cap funds provide a balanced combination of high returns and moderate risk, making them efficient performers.
4. Large-cap funds offer stable and consistent returns with lower volatility, suitable for conservative investors.
5. Risk analysis shows increasing standard deviation across categories, highlighting the importance of risk evaluation.
6. Sharpe ratio analysis indicates that some funds deliver superior risk-adjusted returns, emphasizing efficiency over absolute returns.
7. Rolling return analysis reveals that performance varies over time, though large-cap funds remain relatively stable.
8. Multi-criteria ranking ensures a balanced evaluation based on return, risk, and efficiency.
9. SIP provides stability and disciplined investing by reducing market timing risk.
10. Step-up SIP enhances long-term returns through improved compounding.
11. Lump sum investments can generate higher returns but depend heavily on timing.
12. Hybrid strategies, especially Step-up SIP combined with lump sum, deliver the highest returns.

### **RECOMMENDATIONS**

1. Adopt a category-based approach aligned with risk appetite—large-cap for stability, mid-cap for balance, and small-cap for growth.
2. Use SIP as the core investment strategy for disciplined and consistent investing.
3. Utilize Step-up SIP to increase contributions and enhance long-term wealth creation.



4. Prefer hybrid strategies (SIP + lump sum) to maximize returns through combined benefits.
5. Avoid investing full lump sums in volatile markets; instead, invest gradually or strategically.
6. Focus on risk-adjusted performance (Sharpe ratio, standard deviation) rather than only returns.
7. Maintain a long-term investment horizon to benefit from compounding and market cycles.
8. Financial advisors should provide customized investment solutions based on individual profiles.
9. Encourage diversification across fund categories to balance risk and return.
10. Promote financial awareness and disciplined investing practices among investors.

## CONCLUSION

The study concludes that successful mutual fund investing requires a structured and strategy-driven approach rather than focusing solely on high returns. Aligning fund selection with investor risk profile and adopting appropriate investment strategies are critical for achieving optimal outcomes. SIP and Step-up SIP promote disciplined investing and enhance compounding, while the inclusion of selective lump sum investments improves return potential. Hybrid strategies, particularly Step-up SIP combined with lump sum, emerge as the most effective approach. Overall, a balanced integration of return optimization, risk management, and strategic planning is essential for sustainable long-term wealth creation.

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