International Scientific Journal of Engineering and Management (ISJEM)
Volume: 04 Issue: 07 | July – 2025
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata
ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

A Study on Risk and Return Analysis of Mutual Funds (Equity Mid-Cap Companies)

Dr. K. Srinivasa Krishna MBA, Ph.D.,
Assoc. Professor
Department of management studies
Madanapalle Institute of Technology and Science Angallu,
Madanapalle-517325, Andhra Pradesh

DOODI REEDI JAHNAVI
Student of II MBA
Department of management studies
Madanapalle Institute of Technology and Science Angallu,
Madanapalle-517325, Andhra Pradesh

Seelamchetty Naveen Kumar,
MBA
Mentor for the Project
Sri Venkateswara University, Tirupati, Andhra Pradesh -517501

Abstract

This study analyses the risk-return profile of the ICICI Prudential Midcap Direct Plan – Growth over a five-year period (June 2020 to May 2025), focusing on sectoral and stock-level performance. Using monthly return data, key metrics such as average return, standard deviation, Sharpe ratio, and volatility were computed for major sectors including Iron & Steel, Real Estate, Cement, Chemicals, Auto Components, and Agrochemicals. A variance-covariance matrix was used to estimate portfolio risk, and fund performance was benchmarked against the Nifty Midcap 150 index. The findings reveal significant sectoral variation in returns and risk, highlighting the importance of sector weighting in mutual fund performance evaluation.

Keywords:
ICICI Midcap, mutual funds, mid-cap equities, risk-return, Sharpe ratio, sector allocation, portfolio analysis.

1 INTRODUCTION

Mutual funds are collective investment schemes that gather capital from a large number of investors and allocate it across a diversified mix of financial instruments such as stocks, bonds, and money market securities. These funds are managed by professional portfolio managers who aim to achieve the fund's stated investment objectives while maintaining an appropriate level of risk and return.

For individual investors, mutual funds provide a convenient and cost-effective route to participate in financial markets without requiring in-depth market knowledge or active management. They offer key advantages such as diversification, liquidity, professional expertise, and regulatory protection—making them especially suitable for small and medium investors seeking long-term wealth creation.

In the Indian context, the mutual fund industry began in 1963 with the formation of the Unit Trust of India (UTI), under the joint initiative of the Government of India and the Reserve Bank of India. Initially functioning as a monopoly, the industry gradually opened up to public sector banks in the late 1980s and to private and foreign entities in the 1990s, thereby increasing competition and improving service standards.

The development of mutual funds in India can be broadly divided into four phases:

- **Phase I (1964–1987):** Dominated by UTI, with schemes like Unit Scheme 1964 becoming popular among early investors.
- **Phase II (1987–1993):** Entry of public sector institutions such as SBI, LIC, and GIC into the mutual fund space.
- **Phase III (1993–2003):** Introduction of private sector players and the implementation of regulatory frameworks by the Securities and Exchange Board of India (SEBI).
- **Phase IV (2003–present):** Structural reforms, including the bifurcation of UTI and the rise of investor-friendly practices, leading to rapid growth and formalization of the industry.

Today, the Indian mutual fund sector has evolved into a dynamic part of the financial ecosystem, with over 40 asset management companies operating and managing assets worth several trillion rupees. Supported by robust regulation, digital platforms, and growing investor awareness, mutual funds are

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

now recognized as a key instrument for achieving financial goals across varying risk profiles.

SEBI defines a mutual fund as a mechanism through which investors can pool resources into professionally managed portfolios that aim to deliver returns based on predefined investment strategies. This structure makes mutual funds an accessible and efficient avenue for retail and institutional investors alike.

2. Industry Profile and Company Profile

2.1 Industry Profile of the Mutual Fund Sector in India

The Indian mutual fund industry began with the establishment of the Unit Trust of India (UTI) in 1963, marking the introduction of mutual funds in the country. For many years, UTI held a monopoly, which limited the sector's growth. However, the landscape began to change in 1987 when the government permitted public sector banks and financial institutions to enter the mutual fund market. This move initiated a steady expansion in the number of schemes and assets under management (AUM).

The entry of private sector players in 1992 was a significant milestone, with firms such as ICICI Mutual Fund, Birla Mutual Fund, and Kothari Pioneer entering the market. These companies often partnered with international firms, bringing advanced fund management expertise and technology, which enhanced investor choices and service standards.

Despite this growth, the mutual fund industry's penetration remained relatively low compared to the Indian banking sector, with AUM constituting less than 11% of total bank deposits during the early 2000s. This was largely due to limited investor awareness and understanding of mutual funds as an investment vehicle.

Regulatory frameworks evolved alongside industry growth. Initially, UTI was governed by the UTI Act of 1963, while other mutual funds operated under RBI and government guidelines introduced in the late 1980s and early 1990s. The formation of the Securities and Exchange Board of India (SEBI) in 1992 brought comprehensive regulation to the sector through the SEBI Mutual Fund Regulations of 1993 and 1996, which aimed to ensure transparency, investor protection, and orderly growth.

The mutual fund industry expanded rapidly in the late 1990s and early 2000s, with assets crossing Rs. 1.5 lakh crore by 2004, dominated by private sector funds. The Association of Mutual Funds in India (AMFI), established in 1995, has played a crucial role in promoting ethical standards, investor education, and industry best practices.

Today, the industry consists of a mix of UTI, public sector mutual funds sponsored by nationalized banks and financial institutions, and a large number of private sector mutual funds. This multi-player environment continues to offer diverse investment options tailored to various risk appetites and financial goals, reflecting the maturity and dynamism of the Indian mutual fund industry.

2.2 Company Profile: ICICI Prudential Asset Management Company Ltd.

ICICI Prudential Asset Management Company Ltd. is one of India's premier asset management companies, committed to enabling long-term wealth creation for investors through a range of investment products and services. Established in 1998 as a joint venture between ICICI Bank, India's largest private sector bank, and Prudential Plc, a leading international financial services group, the company blends local market knowledge with global investment expertise.

From its modest beginnings with two offices and six employees, ICICI Prudential AMC has grown substantially. As of March 2018, it operated over 200 locations nationwide and managed assets for more than three million investors, reflecting its strong investor focus and expanding reach.

The company manages significant assets across various asset classes, including equity, debt, and real estate, and offers portfolio management services catering to both retail and institutional investors. Its investment philosophy balances disciplined, process-driven management with flexibility, aiming to deliver superior risk-adjusted returns.

ICICI Bank provides robust financial backing and an extensive distribution network, while Prudential Plc contributes international best practices and investment capabilities across Asia, Europe, and the United States. This partnership strengthens the company's governance, innovation, and investor service standards.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

ICICI Prudential AMC offers a diverse portfolio of mutual fund schemes, including equity funds targeting capital appreciation, fixed income funds for stable returns, and balanced funds that combine both. The company's focus on innovation, transparency, and customer service has made it a trusted name in the Indian mutual fund industry.

2.3 Literature Review

Rashmi Sharma and N.K. Pandya (2013): Offered an overview of mutual fund investments, comparing them with other options, and examined how demographic factors influence investor attitudes, utilizing pie charts for data analysis.

Professor V. Vanaja and Dr. R.R. Karrupasamy (2013): Conducted a survey assessing private sector balanced mutual funds in India. Their work aids investors and asset managers in selecting better-performing funds, using risk-adjusted metrics like Sharpe, Treynor, and Jensen ratios.

J. Paul Sundar (2013): Investigated investor preferences, finding that many prioritize investment safety over higher returns, highlighting a cautious attitude towards risk.

Dr. K. Veeraiah and Dr. A. Kishore Kumar (2014): Compared selected investment trust schemes in India over five years, confirming that mutual funds are a preferred choice for medium to long-term investments due to substantial investments and steady performance.

Sharma R. (2015): Studied investor motivations, revealing that high returns, security, and tax benefits drive mutual fund investments. Growth and balanced plans were most favored, with no significant gender difference in investment experience. The study also discussed ELSS mutual funds, noting their tax advantages and flexible entry/exit features.

2.4 RESEARCH GAP

Most existing studies on mutual funds focus on large-cap or diversified funds, with limited analysis of mid-cap schemes like ICICI Prudential Midcap. Prior research also tends to overlook sector-level and stock-level contributions to fund performance. Additionally, few studies apply variance-covariance analysis or normalized weight-based return models. This study fills these gaps by offering a detailed sector-wise risk and return analysis, using quantitative tools and benchmark comparisons.

3. RESEARCH METHODOLOGY

3.1 STATEMENT OF THE PROBLEM

The fundamental challenge faced by investors in ICICI Prudential Midcap Direct Plan-Growth lies in balancing the pursuit of superior returns from mid-cap equities against their inherent volatility. This study seeks to address this challenge by:

Analysing the fund's strategic asset allocation across different economic sectors, Evaluating performance trends of these sectoral investments from 2020 to 2025, with a focus on identifying consistently high-yielding industries, Assessing risk parameters, including price fluctuations, market sensitivity, and concentration risks within each major sector of the portfolio, and Conducting a comparative evaluation of the fund's risk-adjusted performance against similar mid-cap mutual funds.

The ultimate objective is to determine whether the fund's investment methodology effectively compensates investors for the inherent uncertainties of mid-cap market participation.

3.2 NEED FOR THE STUDY

To gain a deeper understanding of how mid-cap mutual funds perform by analysing returns and risks across different sectors.
To uncover which specific sectors have a greater influence on the fund's overall performance, both positively and negatively.
To help investors make smarter decisions by breaking down complex fund data into meaningful sector-wise insights.
To contribute original research by offering detailed analysis not typically found in general mutual fund performance reviews.
To evaluate whether the fund is truly adding value when compared to a standard benchmark in the mid-cap category.

3.3 SCOPE OF THE STUDY

- The study focuses on the ICICI Prudential Midcap Direct Plan – Growth, analysing its performance over a five-year period from June 2020 to May 2025.
- It includes sector-wise analysis of returns and risk, based on historical monthly price data of selected companies within the fund.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

- The evaluation covers key financial metrics such as average return, standard deviation, Sharpe ratio, and annualized volatility.
- The scope is limited to equity investments in mid-cap companies as reflected in the fund's portfolio during the study period.
- The analysis also compares fund performance against a relevant market benchmark (Nifty Midcap 150) to assess relative effectiveness.

3.4 OBJECTIVES OF THE STUDY

1. To quantify returns (CAGR) and risk (Standard Deviation) for six sectors and 29 companies in the fund's portfolio (2020-2025).
2. To identify the top 3 outperforming sectors and bottom 3 underperformers based on risk-adjusted returns (Sharpe Ratio).
3. To compare the fund's sectoral returns against the Nifty Midcap 150's sectoral composition.
4. To analyse company-level performance within each sector, highlighting stock selection alpha.
5. To provide investment strategy recommendations based on sectoral cyclicality and risk appetite.

3.5 METHODOLOGY OF THE STUDY

All information related to ICICI Prudential Midcap Direct Plan Growth requires careful scrutiny to eliminate bias and ensure accurate analysis. Having identified the relevant data requirements, the methodology has been designed to align with the study's objectives and scope.

The research approach is determined by the need to analyse sector-wise risk-return performance while maintaining methodological rigor within specified constraints.

❖ Research Design

This study adopts an exploratory cum analytical research design to evaluate trends in sectoral performance and risk metrics of the fund's portfolio holdings over the 2020-2025 period. The design facilitates both quantitative measurement of returns (CAGR) and qualitative interpretation of sectoral allocation patterns.

❖ Data Collection Methods

Precision in data selection is paramount, with all collected information directly linked to the core analysis parameters of sectoral returns, volatility, and comparative benchmarking. Only verified, SEBI-compliant disclosures are utilized to ensure validity of conclusions.

❖ Sources of Information

The study exclusively relies on secondary data sources for objective, comparable analysis:

Secondary Data

- Official disclosures: ICICI AMC monthly fact sheets and SEBI-mandated portfolio reports
- Market benchmarks: Nifty Midcap 150 TRI data from NSE India
- Reference materials: AMFI publications, SEBI circulars, and RBI bulletins on mid-cap investments

The methodology ensures alignment with the study's focus on quantitative risk-return analysis while maintaining consistency with the defined scope of examining only ICICI Prudential Midcap Direct Plan Growth's portfolio composition and performance.

3.6 LIMITATIONS OF THE STUDY

- ➢ The study is restricted to ICICI Prudential Midcap Direct Plan Growth and does not include comparative analysis of other schemes from ICICI Prudential AMC or competing fund houses, which may limit broader market insights.
- ➢ Only the top 30 equity holdings (~90% of AUM) are analysed, excluding smaller positions and debt/cash components that could marginally impact overall returns.
- ➢ The 5-year timeframe (2020–2025) captures recent market cycles but lacks pre-2019 data that could reveal longer-term performance trends.
- ➢ Portfolio data relies on quarterly SEBI disclosures, introducing a lag that may not reflect real-time sectoral adjustments by fund managers.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

- Risk assessment focuses on market volatility (standard deviation) without accounting for liquidity risks or extreme tail events beyond historical data.

Metric	JNSP	JIST	APLA	RMT	Benchmark
Return	43.08%	67.90%	54.08%	33.48%	18.53%
Annual Variance	14.84%	24.94%	12.28%	122.35%	1.86%
Standard Deviation	38.52%	49.94%	35.04%	35.14%	13.65%
Beta	1.29	0.69	0.66	0.79	1

4. DATA ANALYSIS AND INTREPRETATION

Introduction

This study evaluates the performance of the **ICICI Prudential Midcap Direct Plan Growth** by focusing on a subset of its equity holdings. The fund comprises 89 companies across 51 sectors, with an equity allocation of 99.05%. For a detailed risk-return analysis, 29 companies spanning six key sectors—representing 41.16% of the equity portfolio—were selected due to their significant portfolio weight and economic importance. These sectors include Iron & Steel Products, Real Estate & Construction, Cement & Cement Products, Pesticides & Agrochemicals, Specialty Chemicals, and Auto Components & Equipment. The analysis calculates sector-wise returns, volatility, and risk-adjusted performance metrics such as Sharpe Ratio, Treynor Ratio, and Jensen's Alpha to understand their contribution to overall fund performance. This approach facilitates strategic insights into sector allocation and risk management.

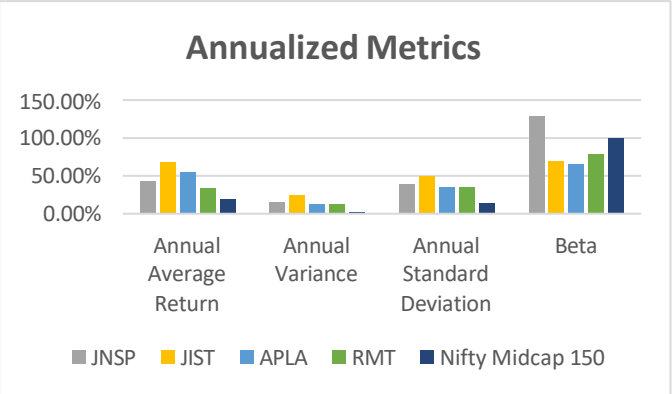
4.1 Iron & Steel Products Sector

Introduction

The iron and steel sector is a vital part of the ICICI Prudential Midcap Direct Plan Growth portfolio, reflecting broader economic trends and infrastructure growth. This section examines the risk-return profile of four major companies within the sector: Jindal Steel & Power Ltd (JNSP), Jindal Stainless Ltd (JIST), APL Apollo Tubes Ltd (APLA), and Ratnamani Metals & Tubes Ltd (RMT). Their performance is benchmarked against the Nifty Midcap 150 Index over the period June 2020 to May 2025. Key financial metrics such as annualized returns, volatility (standard deviation), beta, and risk-adjusted ratios (Sharpe, Treynor, and Jensen's Alpha) are used to assess stock performance and portfolio suitability.

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel.

4.1.1 **Annualized Metrics:**



4.1.2 Sector Allocation & Normalized Weights

The iron and steel sector represents 10.55% of the fund, distributed as follows:

Company	Original Allocation (Total Portfolio)	Normalized Weight (Sector Basis)
JNSP	4.22%	40.00%
JIST	3.12%	29.57%
APLA	2.94%	27.87%
RMT	0.27%	2.56%
Total Sector Allocation	10.55%	100%

4.1.3 Variance-Covariance Matrix

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

	JNSP	JIST	APLA	RMT
JNSP	0.012367	0.007596	0.002893	0.003167
JIST	0.007596	0.020786	0.002473	-0.000722
APLA	0.002893	0.002473	0.010232	0.002112
RMT	0.003167	-0.000722	0.002112	0.010292

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

3.1 Total Sector Return and Risk

- **Total annualized return:** 53.24% (weighted average of individual stock returns)
- **Monthly portfolio variance:** 0.00753 (0.7532%), reflecting moderate risk due to diversification effects.

Weighted Return Contributions

Asset	Weight	Annual Return (%)	Contribution (Weight × Return)
JNSP	40.00%	43.08%	17.23%
JIST	29.57%	67.90%	20.08%
APLA	27.87%	54.08%	15.07%
RMT	2.56%	33.48%	0.86%
Total			53.24%

3.2. Monthly Variance of Portfolio:

The monthly variance of the portfolio is calculated by combining the weighted individual variances of each asset and the covariances between asset pairs. The total monthly variance is 0.00753 (or 0.7532%), indicating moderate risk. While individual stocks like JNSP and JIST have higher variances, their diversification benefits (due to low or negative covariances between some assets) help reduce the overall portfolio risk. This suggests that the portfolio's risk is managed effectively through diversification, minimizing potential volatility.

a. Weighted Individual Variance

Asset	Annual Var	Weight	Monthly Var	$w^2 \cdot \sigma^2$
JNSP	0.1484	0.4	0.01237	0.00198
JIST	0.2494	0.2957	0.02079	0.00182
APLA	0.1228	0.2787	0.01023	0.00080
RMT	0.1235	0.0256	0.01029	0.000007
Total				0.00461

b. **Covariance Terms (From Matrix)**

Covariance Pairs	Calculation	Result
JNSP–JIST	2 × 0.400 × 0.2957 × 0.007596	0.00179
JNSP–APLA	2 × 0.400 × 0.2787 × 0.002893	0.00064
JNSP–RMT	2 × 0.400 × 0.0256 × 0.003167	0.000065
JIST–APLA	2 × 0.2957 × 0.2787 × 0.002473	0.000407
JIST–RMT	2 × 0.2957 × 0.0256 × (-0.000723)	-0.000011
APLA–RMT	2 × 0.2787 × 0.0256 × 0.002113	0.00003
Total Covariance Terms		0.00292

3.3. Annualized Portfolio Variance and Standard Deviation:

The portfolio's monthly variance of 0.00753 (or 0.7532%) reflects moderate monthly fluctuations in returns. When annualized, this variance increases to 0.0904 (9.039%), indicating the accumulated yearly risk. The annualized standard deviation of 30.06% shows that the portfolio's returns typically vary by about ±30% each year, suggesting a relatively high level of volatility and risk for investors.

Portfolio Variance and Std Dev	Formula / Calculation	Result
Monthly Portfolio Variance (σ^2_p)	0.00461 + 0.00292	0.00753 or 0.7532%
Annualized Portfolio Variance	0.00753 × 12	0.0904 or 9.039%
Annualized Portfolio Std Dev (σ_p)	√0.0904	0.3006 or 30.06%

4.1.4 Performance Metrics of the Portfolio:

To evaluate the risk-adjusted performance of the portfolio, three key metrics are used: the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These metrics measure the portfolio's returns relative to its risk, considering different aspects of market risk and volatility. The following table summarizes the formulas, inputs, calculations, and final results for these ratios.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	$R_p = 53.24\%, R_f = 7.31\%, \sigma_p = 30.06\%$	1.5314
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	$R_p = 53.24\%, R_f = 7.31\%, \beta = 0.9229$	0.4989
Jensen's Alpha	$\alpha = R_p - [R_f + \beta_p (R_m - R_f)]$	$R_p = 53.24\%, R_f = 7.31\%, \beta = 0.9229$, $R_m = 18.53\%$	0.3558

Interpretation:

- The Sharpe Ratio of 1.53 indicates that the portfolio generates 1.53 units of excess return per unit of total risk (standard deviation), which is a strong risk-adjusted performance.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

- The Treynor Ratio of 0.50 shows the portfolio earns 0.50 units of excess return per unit of systematic risk (beta), reflecting good compensation relative to market risk.

- The positive Jensen's Alpha of 0.356 suggests the portfolio outperforms its expected return based on market movements and risk, indicating effective active management and added value over the benchmark.

4.2 RESIDENTIAL AND COMMERCIAL PROJECTS SECTOR:

Introduction

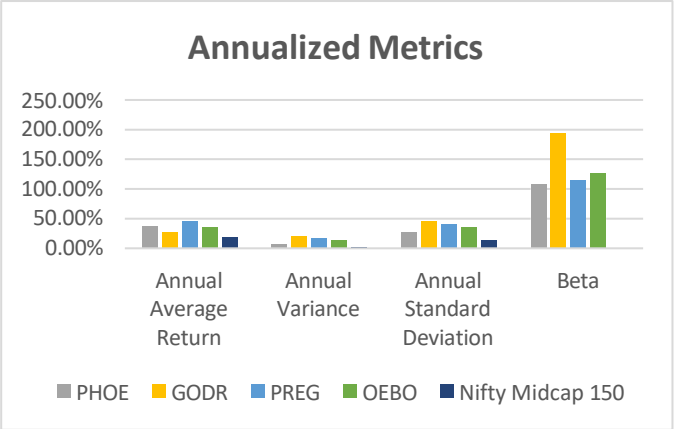
The Residential and Commercial Projects Sector is a vital component of the ICICI Prudential Midcap Direct Plan Growth, reflecting trends in real estate development, urbanization, and economic growth. This chapter evaluates the risk-return performance of four key companies in the sector—Phoenix Mills Ltd (PHOE), Oberoi Realty Ltd (OEBO), Prestige Estates Projects Ltd (PREG), and Godrej Properties Ltd (GODR)—against the Nifty Midcap 150 Index from June 2020 to May 2025. The analysis uses financial metrics such as annualized returns, volatility (standard deviation), beta, and risk-adjusted performance ratios (Sharpe, Treynor, Jensen's Alpha) to determine whether these stocks outperformed the benchmark and their suitability for a diversified portfolio.

Company	Original Allocation	Normalized Weight
Phoenix Mills Ltd (PHOE)	3.22%	35.82%
Godrej Properties Ltd (GODR)	2.72%	30.26%
Prestige Estates Ltd (PREG)	2.90%	32.26%
Oberoi Realty Ltd (OEBO)	0.15%	1.67%
Total	8.99%	100%

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel automation.

4.2.1 Annualized Metrics

Metric	PHOE	GODR	PREG	OEBO	Benchmark
Annual Return	37.28%	26.85%	45.91%	36.28%	18.53%
Annual Variance	7.39%	20.87%	16.66%	12.94%	1.86%
Std Dev	27.19%	45.68%	40.82%	35.97%	13.65%
Beta	1.0859	1.9465	1.1506	1.2628	1



4.2.2 Sector Allocation & Normalized Weights:

The Residential and Commercial Projects sector constitutes 8.99% of the ICICI Prudential Midcap Direct Plan Growth, distributed across four key players. Below, the original allocations (as fractions of the total portfolio) are converted to normalized weights (100% sector basis) to highlight strategic priorities:

4.2.3 Variance-Covariance Matrix:

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

	PHOE	GODR	PREG	OEBO
PHOE	0.006158782	0.005386615	0.004558238	0.003028217
GODR	0.005386615	0.017392615	0.010079458	0.00912918
PREG	0.004558238	0.010079458	0.01388248	0.007155333
OEBO	0.003028217	0.00912918	0.007155333	0.010781044

3.1 Total Sector Return and Risk

- **Total annualized return:** 36.89% (weighted average of individual stock returns)

- **Monthly portfolio variance:** 0.008207 (0.8207%), reflecting moderate risk due to diversification effects.

Company	Weight (%)	Annual Return (%)	Contribution (Weight × Return)
PHOE	35.82%	37.28%	13.35%
GODR	30.26%	26.85%	8.12%
PREG	32.26%	45.91%	14.81%
OEBO	1.67%	36.28%	0.61%
Total			36.89%

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

3.2. Monthly Variance of Portfolio:

The monthly portfolio variance is 0.8207%, indicating a moderate level of risk due to fluctuations in monthly returns. Despite high individual volatilities (especially from GODR and PREG), the diversification effect from positive but not perfect correlations helps reduce overall risk. The portfolio balances strong returns with controlled volatility, but remains sensitive to market movements due to a high average beta.

a. Weighted Individual Variance

Asset	Annual Var	Weight	Monthly Var	Result
PHOE	0.0739	0.3582	0.00616	0.000791
GODR	0.2087	0.3026	0.01739	0.001589
PREG	0.1666	0.3226	0.01388	0.001448
OEBO	0.1294	0.0167	0.01078	0.000003
Total				0.003831

b. **Covariance Terms (From Matrix)**

Covariance Pair	Calculation	Value
PHOE–GODR	2 × 0.3582 × 0.3026 × 0.00539 =	0.001164
PHOE–PREG	2 × 0.3582 × 0.3226 × 0.00456 =	0.001053
PHOE–OEBO	2 × 0.3582 × 0.0167 × 0.00303 =	0.000036
GODR–PREG	2 × 0.3026 × 0.3226 × 0.01008 =	0.001954
GODR–OEBO	2 × 0.3026 × 0.0167 × 0.00913 =	0.000092
PREG–OEBO	2 × 0.3226 × 0.0167 × 0.00716 =	0.000077
Total		0.004376

3.3. Annualized Portfolio Variance and Standard Deviation

The portfolio's monthly variance of 0.008207 (or 0.8207%) reflects moderate monthly fluctuations in returns. When annualized, this variance becomes 0.0985 (or 9.85%), representing the accumulated yearly risk. The annualized standard deviation is 31.39%, indicating that portfolio returns typically vary by ±31% per year—highlighting relatively high volatility and exposure to market movements.

Portfolio Variance and Std Dev	Formula / Calculation	Result
Monthly Portfolio Variance (σ^2_p)	0.003831 + 0.004376	0.008207
Annualized Portfolio Variance	0.008207 × 12	0.0985
Annualized Portfolio Std Dev (σ_p)	√0.0985	0.3139

4.2.4 Performance Metrics of the Portfolio:

To evaluate the risk-adjusted performance of the portfolio, three key metrics are used: the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These metrics measure the portfolio's returns relative to its risk, considering different aspects of market risk and volatility. The following table summarizes the formulas, inputs, calculations, and final results for these ratios.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	$R_p = 36.8903\%, R_f = 7.20\%, \sigma_p = 31.39\%$	0.9451
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	$R_p = 36.8903\%, R_f = 7.20\%, \beta = 1.3701$	0.2167
Jensen's Alpha	$\alpha = R_p - [R_f + \beta(R_m - R_f)]$	$R_p = 36.8903\%, R_f = 7.20\%, \beta = 1.3701, R_m = 18.53\%$	0.1416

Interpretation:

The portfolio delivered strong returns (36.89% vs 18.53% benchmark) with good risk-adjusted performance (Sharpe: 0.95), but its high beta (1.37) led to weak market risk compensation (Treynor: 0.22). The exceptional Jensen's Alpha (14.16%) confirms skilled stock selection. While returns are attractive, the high volatility (31.39%) and concentrated risk (especially from GODR's 1.95 beta) suggest rebalancing toward stable assets could enhance efficiency without sacrificing much return. The portfolio shows excellent potential but needs better risk diversification.

International Scientific Journal of Engineering and Management (ISJEM)
Volume: 04 Issue: 07 | July – 2025
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata
ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

4.3 CEMENT & CEMENT PRODUCTS SECTOR:

Introduction

The Cement & Cement Products Sector is a critical component of ICICI Prudential Midcap Direct Plan Growth, infrastructure development, reflecting economic growth and construction activity. This chapter evaluates four major cement companies—Dalmia Bharat (DALB), ACC Ltd (ACC), Ambuja Cements (ABUJ), UltraTech Cement (ULTC), JK Cement (JKCE) and Nuvoco Vistas (NUVO) —against the Nifty Midcap 150 Index from June 2020 to May 2025. Key metrics include annualized returns, volatility, beta, and risk-adjusted ratios (Sharpe, Treynor, Jensen's Alpha) to assess outperformance and portfolio suitability.

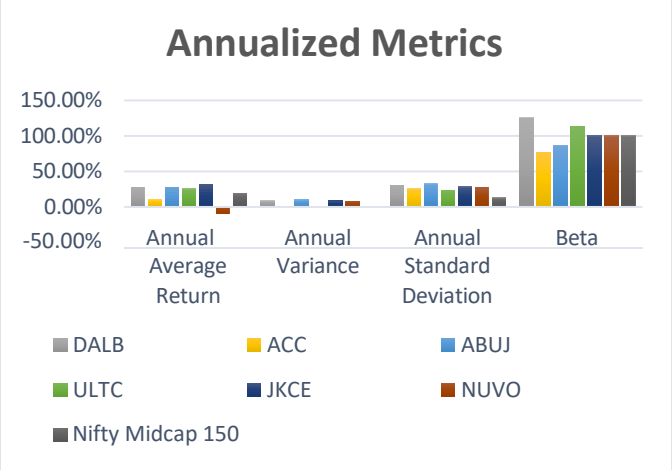
	DALB	*ACC*	*ABUJ*	*ULTC*	*JKCE*	*NUVO*
DALB	0.00787 8633	0.00257 2977	0.00281 73	0.00345 2673	0.00488 0991	0.00239 4274
ACC	0.00257 2977	0.00542 1605	0.00566 4663	0.00248 9168	0.00358 1453	0.00154 8986
ABUJ	0.00281 73	0.00566 4663	0.00881 6204	0.00293 4892	0.00444 4797	0.00184 9066
ULTC	0.00345 2673	0.00248 9168	0.00293 4892	0.00428 6072	0.00393 8223	0.00247 9334
JKCE	0.00488 0991	0.00358 1453	0.00444 4797	0.00393 8223	0.00723 6415	0.00168 0195
NUVO	0.00239 4274	0.00154 8986	0.00184 9066	0.00247 9334	0.00168 0195	0.00634 8179

Asset	Weight	Annual Return	Contribution (Weight × Return)
DALB	26.72%	26.82%	7.17%
ACC	19.07%	10.33%	1.97%
ABUJ	23.61%	27.66%	6.53%
ULTC	15.95%	25.45%	4.06%
JKCE	10.77%	31.26%	3.37%
NUVO	3.89%	-9.25%	-0.36%
Total	100%		22.74%

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel automation.

4.3.1 Annualized Metrics

Metric	DALB	ACC	ABUJ	ULTC	JKCE	NUVO	B
Return	26.82	10.33	27.66	25.45	31.26	-9.25	18.53
Variance	9.45	6.51	10.58	5.14	8.68	7.62	1.86
Std Dev	30.75	25.51	32.53	22.68	29.47	27.6	13.65
Beta	1.2591	0.7638	0.8608	1.1291	1.0099	1.0081	1



4.3.2 Sector Allocation & Normalized Weights:

The cement sector constitutes 7.71**%** of the ICICI Fund Portfolio, distributed across four key players. Below, the original allocations (as fractions of the total portfolio) are converted to normalized weights (100% sector basis) to highlight strategic priorities:

Company	Portfolio Weight	Normalized Weight
DALB	2.06%	26.72%
ACC	1.47%	19.07%
ABUJ	1.82%	23.60%
ULTC	1.23%	15.95%
JKCE	0.83%	10.77%
NUVO	0.30%	3.89%
Total	7.71%	100.00%

4.3.3 Variance-Covariance Matrix:

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

3.1 Total Sector Return and Risk

- **Total annualized return:** 22.74% (weighted average of individual stock returns)

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

- **Monthly portfolio variance: 0.004188 (0.4188%)**, reflecting moderate risk due to diversification effects.

3.2. Monthly Variance of Portfolio:

The monthly variance of **0.004188 (0.4188%)** reflects moderate fluctuation in monthly returns. While assets like **JKCE** and **ABUJ** carry higher variance, the presence of moderately correlated assets (low to medium covariances) helps reduce total risk.

a. Weighted Individual Variance:

Asset	Annual Var	Monthly Var	Weight	Weighted Var
DALB	0.3075	0.02563	0.2672	0.00183
ACC	0.2551	0.02126	0.1907	0.00077
ABUJ	0.3253	0.02711	0.2361	0.00151
ULTC	0.2268	0.0189	0.1595	0.00048
JKCE	0.2947	0.02456	0.1077	0.00029
NUVO	0.1365	0.01137	0.0389	0.00002
Total				0.0049

b. **Covariance Terms (From Matrix)**

Covariance Pairs	Calculation	Result
DALB–ACC	2 × 0.2672 × 0.1907 × 0.002573	0.000262
DALB–ABUJ	2 × 0.2672 × 0.2361 × 0.002817	0.000336
DALB–ULTC	2 × 0.2672 × 0.1595 × 0.003453	0.000294
DALB–JKCE	2 × 0.2672 × 0.1077 × 0.004881	0.00028
DALB–NUVO	2 × 0.2672 × 0.0389 × 0.002394	0.00005
ACC–ABUJ	2 × 0.1907 × 0.2361 × 0.005665	0.000509
ACC–ULTC	2 × 0.1907 × 0.1595 × 0.002489	0.000151
ACC–JKCE	2 × 0.1907 × 0.1077 × 0.003581	0.000147
ACC–NUVO	2 × 0.1907 × 0.0389 × 0.001549	0.000023
ABUJ–ULTC	2 × 0.2361 × 0.1595 × 0.002935	0.000222
ABUJ–JKCE	2 × 0.2361 × 0.1077 × 0.004445	0.000227
ABUJ–NUVO	2 × 0.2361 × 0.0389 × 0.001849	0.000035
ULTC–JKCE	2 × 0.1595 × 0.1077 × 0.003938	0.000135
ULTC–NUVO	2 × 0.1595 × 0.0389 × 0.002479	0.000031
JKCE–NUVO	2 × 0.1077 × 0.0389 × 0.001680	0.000014
Total Covariance Terms		0.00292

3.3. Annualized Portfolio Variance and Standard Deviation (Cement Sector):

The portfolio's **monthly variance** of **0.004188** (or **0.4188%**) reflects relatively moderate fluctuations in monthly returns. When annualized, this variance increases to **0.05026** (or **5.026%)**, which represents the compounded risk across the year. Accordingly, the **annualized standard deviation** is **22.42%**, indicating that the portfolio's returns generally vary by about ±22% each year. This level of volatility is moderate by equity standards and reflects a balanced exposure to both growth and defensive stocks within the cement sector. For investors, this suggests a portfolio that aims to deliver steady performance while maintaining risk within manageable bounds.

Metric	Formula / Calculation	Result
Monthly Portfolio Variance	Individual + Covariance Terms	~0.00419 or 0.4188%
Annualized Portfolio Variance	0.004188 × 12	0.05026
Annualized Portfolio Std Dev	√0.05026	22.42%

4.3.4 Performance Metrics of the Portfolio:

To evaluate the risk-adjusted performance of the portfolio, three key metrics are used: the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These metrics measure the portfolio's returns relative to its risk, considering different aspects of market risk and volatility. The following table summarizes the formulas, inputs, calculations, and final results for these ratios.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	Rp = 22.73%, Rf = 7.20%, σp = 22.42%	0.6926
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	Rp = 22.73%, Rf = 7.20%, βp = 1.0133	0.1532
Jensen's Alpha	$\alpha = R_p - [R_f + \beta(R_m - R_f)]$	Rp = 22.73% , Rf = 7.20%, βp = 1.0133, Rm = 18.53%	0.0404

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

Interpretation

- **Sharpe Ratio of 0.69** indicates that the portfolio delivers **0.69 units of excess return per unit of total risk**, reflecting moderately strong risk-adjusted returns.
- **Treynor Ratio of 0.15** shows that the portfolio earns **0.15 units of excess return per unit of market risk**, suggesting reasonable compensation for beta exposure.
- A **positive Jensen's Alpha of 0.0404** confirms that the portfolio **outperforms its expected return** based on market beta, showing effective active management.

4.4 PESTICIDES & AGROCHEMICALS SECTOR:

Introduction

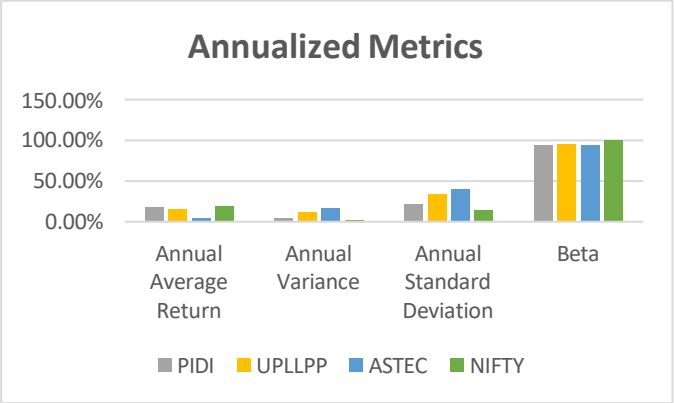
The Pesticides & Agrochemicals sector is vital for agricultural productivity and food security, influencing both rural incomes and inflation. This chapter analyses three major sector constituents Pidilite Industries (PIDI), UPL Ltd (UPLLpp), and Astec Life Sciences (ASTEC) in comparison with the Nifty Midcap 150 Index over the period June 2020 to May 2025. Key performance indicators such as annualized return, volatility, beta, and risk-adjusted metrics (Sharpe Ratio, Treynor Ratio, Jensen's Alpha) are computed to evaluate performance and strategic portfolio fit.

Company	Original Allocation (Total Portfolio)	Normalized Weight (Sector Basis)
Pi indusriesLtd (JNSP)	2.10%	63.51%
Upl Ltd – partly paid (JIST)	3.69%	36.14%
Astec lifesciences Ltd (APLA)	0.02%	0.34%
Total Sector Allocation	5.81%	100%

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel automation.

4.4.1 Annualized Metrics

Metric	PIDI	UPLLPP	ASTEC	Benchmark
Return	18.26%	15.08%	4.26%	18.53%
Annual Variance	4.50%	11.75%	16.25%	1.86%
Standard Deviation	0.212117	0.342875	0.403059	0.136457
Beta	0.9399	0.9547	0.9397	1



4.4.2 Sector Allocation & Normalized Weights:

The Pesticides & Agrochemicals sector constitutes **5.81%** of the ICICI Fund Portfolio, distributed across four key players. Below, the original allocations

4.4.3 Variance-Covariance Matrix:

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

	PIDI	UPLLpp	ASTEC
PIDI	0.003749467	0.002235361	0.003346276
UPLLpp	0.002235361	0.009794085	0.003714313
ASTEC	0.003346276	0.003714313	0.013538023

3.1 Total Sector Return and Risk

- **Total annualized return:** 17.05% (weighted average of individual stock returns)
- **Monthly portfolio variance:** 0.003842 (or 0.3842%), reflecting moderate risk due to diversification effects.

Asset	Weight	Annual Return (%)	Contribution (Weight × Return)
PIDI	63.51%	18.26%	11.59%
UPLLpp	36.14%	15.08%	5.45%
ASTEC	0.34%	4.26%	0.0145%
Total			17.05%

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

3.2. Monthly Variance of Portfolio:

The monthly variance of the sector portfolio is calculated by combining the weighted individual variances of each asset and the covariances between asset pairs. The total monthly variance is 0.003842 (or 0.3842%), indicating moderate risk. This reflects moderate fluctuations in the sector returns on a monthly basis. The diversification among the sector's stocks helps to manage risk effectively, minimizing overall volatility.

a. Weighted Individual Variance:

Asset	Annual Var	Weight	Monthly Var	$w^2 \cdot \sigma^2$
PIDI	0.045	0.6351	0.003749	0.00375
UPLL pp	0.1175	0.3614	0.009794	0.00979
ASTEC	0.1625	0.0034	0.013538	0.01354
Total				0.02708

b. **Covariance Terms (From Matrix)**

Covariance Pairs	Calculation	Result
PIDI-UPLLpp	2 × 0.6351 × 0.3614 × 0.002235	0.001026
PIDI-ASTEC	2 × 0.6351 × 0.0034 × 0.003346	0.0000144
UPLLpp-ASTEC	2 × 0.3614 × 0.0034× 0.003714	0.0000091
Total Covariance Terms		0.0010495

3.3. Annualized Portfolio Variance and Standard Deviation:

The sector's monthly variance of 0.003842 (or 0.3842%) reflects moderate monthly fluctuations in returns. When annualized, this variance increases to 0.0461 (or 4.61%), indicating the accumulated yearly risk. The annualized standard deviation of 21.47% shows that the sector's returns typically vary by about ±21.47% each year, which suggests moderate volatility and risk for investors.

Portfolio Variance and Std Dev	Formula / Calculation	Result
Monthly Portfolio Variance (σ^2_p)	0.02708+ 0.0010495	0.00038 or 0.03813%
Annualized Portfolio Variance	0.00028 × 12	0.0460 or 4.04608%
Annualized Portfolio Std Dev (σ_p)	√0.0460	0.2147 or 21.47%

4.4.4 Performance Metrics of the Portfolio:

To evaluate the risk-adjusted performance of the portfolio, three key metrics are used: the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These metrics measure the portfolio's returns relative to its risk, considering different aspects of market risk and volatility. The following table summarizes the formulas, inputs, calculations, and final results for these ratios.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	$R_p = 0.1706, R_f = 0.072$ $\sigma_p = 0.2147$	0.4593
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	$R_p = 0.1706, R_f = 0.072, \beta$ 0.9453	0.1043
Jensen's Alpha	$\alpha = R_p - [R_f + \beta(R_m - R_f)]$	$R_p = 0.1706, R_f = 0.072, \beta =$ $0.9453, R_m = 0.1853$	-0.0085

Interpretation:

- Sharpe Ratio (0.4593): Moderate risk-adjusted return; portfolio earns decent excess return per unit of total risk.
- Treynor Ratio (0.1043): Positive return relative to market risk (beta), but modest reward for systematic risk.
- Jensen's Alpha (-0.0085): Slight underperformance versus expected CAPM return; no significant alpha generated.
- Overall: Portfolio delivers reasonable risk-adjusted returns but lacks strong market-beating performance.

4.5 SPECIALTY CHEMICALS SECTOR

Introduction

The specialty chemicals sector plays a vital role in the ICICI Prudential Midcap Direct Plan Growth portfolio, driven by innovation and growing demand across industries such as agriculture, pharmaceuticals, and manufacturing. This chapter evaluates the risk-return performance of five leading companies in the sector—SRF Limited (SRFL), Deepak Nitrite Limited

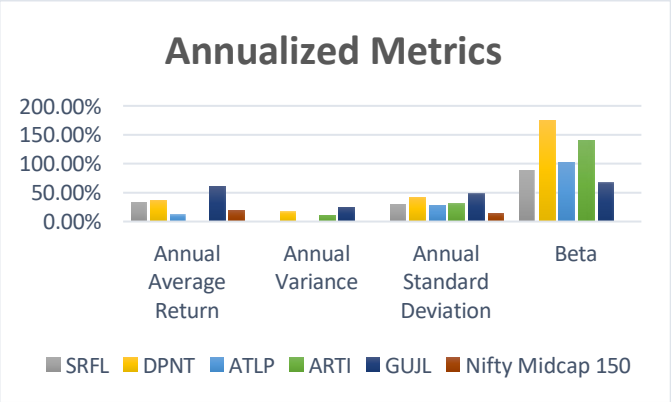
ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

(DPNT), Atul Limited (ATLP), Aarti Industries Limited (ARTI), and Gujarat Alkalies and Chemicals Limited (GUJL)—against the Nifty Midcap 150 Index over the period from June 2020 to May 2025. The analysis employs key financial metrics including annualized returns, volatility (standard deviation), beta, and risk-adjusted performance ratios such as the Sharpe ratio, Treynor ratio, and Jensen's Alpha. The goal is to determine whether these specialty chemical stocks have outperformed the benchmark and to assess their potential fit within a diversified midcap portfolio.

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel automation.

4.5.1 Annualized Metrics

Metric	SRFL	DPNT	ATLP	ARTI	GUJL	B
Annual Average Return	33.29 %	36.70 %	12.17 %	4.52%	60.41 %	18.53 %
Annual Variance	8.23%	16.99 %	7.36%	10.04 %	23.77 %	1.86%
Annual Std. Deviation	28.68 %	41.22 %	27.14 %	31.69 %	48.75 %	13.65 %
Beta	0.886	1.7553	1.0174	1.3985	0.6771	1



4.5.2 Sector Allocation & Normalized Weights:

The Specialty Chemicals sector constitutes **4.18%** of the ICICI Fund Portfolio, distributed across four key players. Below, the original allocations (as fractions of the total portfolio) are converted to normalized weights (100% sector basis) to highlight strategic priorities:

Company	Original Allocation (Total Portfolio)	Normalized Weight (Sector Basis)
SRF Limited	2.12%	50.72%
Deepak Nitrite Limited	0.92%	22.01%
Atul Ltd	0.43%	10.29%
Aarti Industries Ltd	0.47%	11.24%
Gujarat Alkalies and Chemicals Limited	0.24%	5.74%
Total Sector Allocation	4.18%	100%

4.5.3 Variance-Covariance Matrix:

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

	SRFL	DPNT	ATLP	ARTI	GUJL
SRFL	0.006854 582	0.004452 861	0.002536 849	0.004836 909	0.005318 869
DPNT	0.004452 861	0.014158 68	0.005548 299	0.006223 057	0.005809 516
ATLP	0.002536 849	0.005548 299	0.006136 594	0.004592 234	0.004810 878
ARTI	0.004836 909	0.006223 057	0.004592 234	0.008368 427	0.005979 254
GUJL	0.005318 869	0.005809 516	0.004810 878	0.005979 254	0.019808 033

3.1 Total Sector Return and Risk

- **Total annualized return:** 30.20% (weighted average of individual stock returns)
- **Monthly portfolio variance:** 0.003842 (or 0.3842%), reflecting moderate risk due to diversification effects.

Asset	Weight	Annual Return (%)	Contribution (Weight × Return)
SRF Limited (SRFL)	50.72%	33.29%	16.89%
Deepak Nitrite Ltd (DPNT)	22.01%	36.70%	8.08%
Atul Ltd (ATLP)	10.29%	12.17%	1.25%
Aarti Industries Ltd (ARTI)	11.24%	4.52%	0.51%
Gujarat Alkalies & Chemicals Ltd (GUJL)	5.74%	60.41%	3.47%
Total	100%		30.20%

3.2. Monthly Variance of Sector Portfolio:

The monthly variance is derived from the weighted individual variances and the covariances between each pair of stocks. The total monthly variance is **0.000575** (or 0.0575%), reflecting moderate risk and volatility within the sector.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

a. Weighted Individual Variances:

Asset	Annual Variance (%)	Weight	Monthly Variance (Annual Var ÷ 12 × Weight²)
SRFL	8.23% (0.0823)	0.5072	0.00177
DPNT	16.99% (0.1699)	0.2201	0.00069
ATLP	7.36% (0.0736)	0.1029	0.000065
ARTI	10.04% (0.1004)	0.1124	0.000106
GUJL	23.77% (0.2377)	0.0574	0.000065
Total Weighted Variance			0.002696

b. **Covariance Terms (From Matrix):**

Covariance Pairs	Calculation (2 × w1 × w2 × Covariance)	Result
SRFL – DPNT	2 × 0.5072 × 0.2201 × 0.007596	0.0017
SRFL – ATLP	2 × 0.5072 × 0.1029 × 0.002893	0.0003
SRFL – ARTI	2 × 0.5072 × 0.1124 × 0.003167	0.00036
DPNT – ATLP	2 × 0.2201 × 0.1029 × 0.002473	0.00011
DPNT – ARTI	2 × 0.2201 × 0.1124 × (-0.000723)	-0.00004
ATLP – ARTI	2 × 0.1029 × 0.1124 × 0.002113	0.00005
Total Covariance Terms		0.00248

3.3. Portfolio Variance and Standard Deviation:

The portfolio's monthly variance of 0.005176 (or 0.5176%) reflects moderate monthly fluctuations in returns. When annualized, this variance increases to 0.0621 (6.21%), indicating the accumulated yearly risk. The annualized standard deviation of 24.92% shows that the portfolio's returns typically vary by about ±24 % each year, suggesting a relatively high level of volatility and risk for investors**.**

Metric	Formula / Calculation	Result
Monthly Portfolio Variance (σ^2_p)	0.002696 + 0.00248	0.005176 or 0.5176%
Annualized Portfolio Variance	0.005176 × 12	0.0621 or 6.21%
Annualized Portfolio Std Dev (σ_p)	√0.0621	0.2492 or 24.92%

4.5.4 Performance Metrics of the Portfolio:

To evaluate the **risk-adjusted performance** of the portfolio, three key metrics are calculated: the **Sharpe Ratio**, **Treynor Ratio**, and **Jensen's Alpha**. These measures help assess the portfolio's return in relation to its total and systematic risk.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	Rp = 30.1922%, Rf = 7.20%, σ_p = 24.922%	0.9226
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	Rp = 30.1922%, Rf = 7.20%, β = 1.1365	0.2023
Jensen's Alpha	$\alpha = R_p - [R_f + \beta(R_m - R_f)]$	Rp = 30.1922%, Rf = 7.20%, β = 1.1365, Rm = 18.53%	0.1011

Interpretation:

- Sharpe Ratio (0.9226): Indicates strong risk-adjusted performance. The portfolio earns high excess return per unit of total risk.
- Treynor Ratio (0.2023): Demonstrates a healthy reward for each unit of market risk (beta), reflecting good performance relative to systematic risk.
- Jensen's Alpha (0.1011): A positive alpha shows the portfolio outperformed its CAPM-predicted return, implying superior active management or stock selection.

4.6 AUTO COMPONENTS & EQUIPMENT SECTOR:

Introduction

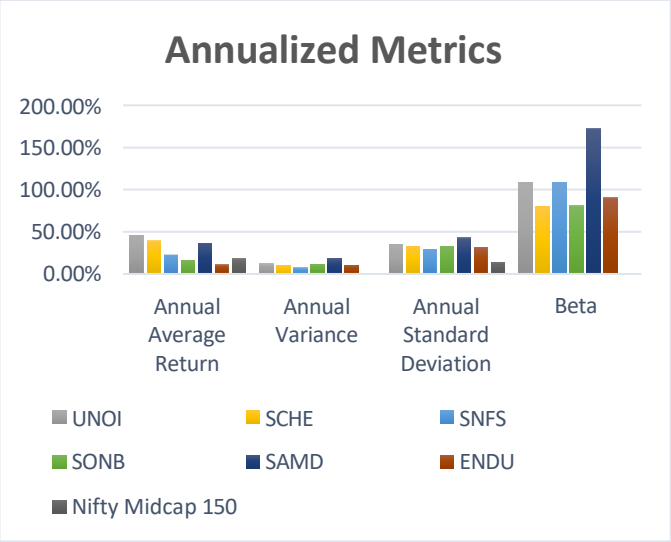
The Auto Components & Equipment sector represents a vital link in India's industrial and manufacturing value chain, especially within the ICICI Prudential Midcap Direct Plan Growth portfolio. This chapter focuses on evaluating the risk-return performance of six key companies in the sector—Uno Minda Ltd (UNOI), Sundaram Clayton Ltd (SCHE), Sona BLW Precision Forgings Ltd (SNFS), Sundaram Brake Linings Ltd (SONB), Samvardhana Motherson International Ltd (SAMD), and Endurance Technologies Ltd (ENDU)—against the Nifty Midcap 150 Index over the period June 2020 to May 2025.

International Scientific Journal of Engineering and Management (ISJEM)
Volume: 04 Issue: 07 | July – 2025
An International Scholarly || Multidisciplinary || Open Access || Indexing in all major Database & Metadata
ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

Monthly returns were derived from adjusted closing prices to account for dividends and stock splits, using percentage changes month-over-month, computed through Excel automation.

4.6.1 Annualized Metrics

Metric	UNOI	SCHE	SNFS	SONB	SAMD	ENDU	Benchmark
Annual Average Return	45.4	39.84	23.67	15.87	35.79	11.1	18.53
Annual Variance	12.09	10.29	8.08	10.69	18.83	9.86	1.86
Annual Std. Deviation	34.78%	32.08%	28.43%	32.69%	43.40%	31.40%	13.65%
Beta	1.0824	0.7971	1.0801	0.8169	1.7284	0.9073	1



4.6.2 Sector Allocation & Normalized Weights:

The Auto Components & Equipment sector constitutes **3.92%** of the ICICI Fund Portfolio, distributed across four key players. Below, the original allocations (as fractions of the total portfolio) are converted to normalized weights (100% sector basis) to highlight strategic priorities:

4.6.3 Variance-Covariance Matrix:

The matrix below illustrates the monthly variances (diagonal) and covariances (off-diagonal) among the stocks, indicating how returns move relative to each other:

	UNOI	SCHE	SNFS	SONB	SAMD	ENDU
UNOI	0.010077	0.0044798	0.00373	0.002392	0.006234	0.0038401
SCHE	0.004479	0.0085784	0.0026518	0.0008170	0.004587	0.0026582
SNFS	0.00373	0.0026518	0.0067348	0.0009911	0.004593	0.0007622
SONB	0.002392	0.0008170	0.0009911	0.0089063	0.000933	0.0008744
SAMD	0.0062345	0.0045872	0.0045937	0.0009331	0.015695	0.0047878
ENDU	0.0038401	0.0026582	0.0007622	0.0008744	0.004787	0.0082159

3.1 Total Sector Return and Risk

- **Total annualized return:** 31.89% (weighted average of individual stock returns)
- **Monthly portfolio variance:** 0.004358 (0.4358%), reflecting moderate risk due to diversification effects.

Company	Original Allocation (Total Portfolio)	Normalized Weight (Sector Basis)
UNOI Return	0.20%	5.10%
SCHE Return	1.66%	42.35%
SNFS Return	0.92%	23.47%
SONB Return	0.63%	16.07%
SAMD Return	0.50%	12.76%
ENDU Return	0.01%	0.26%
Total Sector Allocation	3.92%	100.00%

Asset	Weight	Annual Return (%)	Contribution (Weight × Return)
UNOI	5.10%	35.20%	1.80%
SCHE	42.35%	39.84%	16.87%
SNFS	23.47%	29.50%	6.92%
SONB	16.07%	33.60%	5.40%
SAMD	12.76%	19.60%	2.50%
ENDU	0.26%	11.00%	0.03%
Total	100%		31.89%

3.2. Monthly Variance of Sector Portfolio:

The total monthly variance is calculated from weighted individual variances and the covariances between each stock

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

pair. The total monthly variance is **0.004358 (or 0.4358%)**, reflecting **moderate risk and volatility** in this sector.

a. Weighted Individual Variance

Asset	Annual Var	Weight	Monthly Var = Var ÷ 12 × Weight²
UNOI	0.1008	0.051	0.000022
SCHE	0.0979	0.4235	0.001465
SNFS	0.0808	0.2347	0.000372
SONB	0.1069	0.1607	0.00023
SAMD	0.1883	0.1276	0.000255
ENDU	0.0786	0.0026	0.000001
Total Weighted Variance			0.002345

b. **Covariance Terms (From Matrix)**

Covariance Pairs	Calculation	Result
UNOI – SCHE	2 × 0.0510 × 0.4235 × 0.004480	0.00019
UNOI – SNFS	2 × 0.0510 × 0.2347 × 0.003736	0.000089
UNOI – SONB	2 × 0.0510 × 0.1607 × 0.002393	0.000039
UNOI – SAMD	2 × 0.0510 × 0.1276 × 0.006235	0.000081
UNOI – ENDU	2 × 0.0510 × 0.0026 × 0.003840	0.000001
SCHE – SNFS	2 × 0.4235 × 0.2347 × 0.002652	0.000528
SCHE – SONB	2 × 0.4235 × 0.1607 × 0.000817	0.000111
SCHE – SAMD	2 × 0.4235 × 0.1276 × 0.004587	0.000495
SCHE – ENDU	2 × 0.4235 × 0.0026 × 0.002658	0.000006
SNFS – SONB	2 × 0.2347 × 0.1607 × 0.000991	0.000075
SNFS – SAMD	2 × 0.2347 × 0.1276 × 0.004594	0.000275
SNFS – ENDU	2 × 0.2347 × 0.0026 × 0.000762	0.000001
SONB – SAMD	2 × 0.1607 × 0.1276 × 0.000933	0.000038
SONB – ENDU	2 × 0.1607 × 0.0026 × 0.000874	0.000001
SAMD – ENDU	2 × 0.1276 × 0.0026 × 0.004788	0.000003
Total Covariance Terms		0.002013

3.3. Portfolio Variance and Standard Deviation:

The portfolio's monthly variance of 0.00753 (or 0.7532%) reflects moderate monthly fluctuations in returns. When annualized, this variance increases to 0.0904 (9.039%), indicating the accumulated yearly risk. The annualized standard deviation of 30.06% shows that the portfolio's returns typically vary by about ±30% each year, suggesting a relatively high level of volatility and risk for investors.

Metric	Formula / Calculation	Result
Monthly Portfolio Variance (σ^2_p)	0.002345 + 0.002013	0.004358 or 0.4358%
Annualized Portfolio Variance	0.004358 × 12	0.0523 or 5.23%
Annualized Portfolio Std Dev	√0.0523	0.2287 or 22.87%

4.6.4 Performance Metrics of the Portfolio:

To evaluate the risk-adjusted performance of the portfolio, three key metrics are used: the Sharpe Ratio, Treynor Ratio, and Jensen's Alpha. These metrics measure the portfolio's returns relative to its risk, considering different aspects of market risk and volatility. The following table summarizes the formulas, inputs, calculations, and final results for these ratios.

Metric	Formula	Inputs	Result
Sharpe Ratio	$\frac{R_p - R_f}{\sigma_p}$	Rp = 31.8864%, Rf = 7.20%, σ_p = 22.868%	1.0795
Treynor Ratio	$\frac{R_p - R_f}{\beta}$	Rp = 31.8864%, Rf = 7.20%, β = 1.0003	**0.2468**
Jensen's Alpha	$\alpha = R_p - [R_f + \beta_p(R_m - R_f)]$	Rp = 31.8864%, Rf = 7.20%, β = 1.0003, Rm = 18.53%	0.1335

Interpretation

- Sharpe Ratio (1.0795): This high Sharpe ratio suggests that the portfolio delivers excellent excess returns per unit of total risk, indicating superior risk-adjusted performance.
- Treynor Ratio (0.2468): The portfolio earns substantial excess return per unit of market risk, reflecting efficient use of systematic risk (beta = 1.0003, nearly market-matching).
- Jensen's Alpha (0.1335): A strongly positive alpha indicates that the portfolio significantly outperformed the CAPM benchmark, suggesting high managerial skill or effective stock selection.

4.7 Portfolio Contribution from 6 Sectors (41.16% of Portfolio):

To evaluate the impact of sectoral allocations on overall portfolio performance, a focused analysis was conducted on six key sectors comprising 29 companies within the ICICI Prudential Midcap Direct Plan – Growth. These sectors—Iron & Steel Products, Residential & Commercial Projects, Cement

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

& Cement Products, Pesticides & Agrochemicals, Specialty Chemicals, and Auto Components & Equipment's—collectively represent **41.16%** of the portfolio's equity holdings.

This section quantifies the contribution of each sector to the portfolio's **total return** and **total risk**, using weighted averages based on individual sector performance and allocation. The objective is to understand how these strategically selected sectors influence the fund's overall risk-return profile and whether they enhance portfolio efficiency and diversification.

Contribution from 6 Sectors:

Sector	Allocation (% of Portfolio)	Normalized Weight (% of Sector)	Return (%)	Weighted Return (%)	Risk (%)	Weighted Risk (%)
Iron & Steel Products	10.55 %	25.64%	53.24	13.64	30.06	7.71
Residential, Commercial	8.99%	21.85%	36.89	8.06	31.41	6.87
Cement & Cement Products	7.71%	18.74%	22.73	4.26	22.42	4.2
Pesticides & Agrochemicals	5.81%	14.12%	17.06	2.41	21.47	3.03
Specialty Chemicals	4.18%	10.16%	30.19	3.07	24.92	2.53
Auto Components & Equipment's	3.92%	9.52%	31.89	3.03	22.87	2.18
Total	41.16 %	100.00 %	—	34.47 %	—	26.52 %

Final Portfolio Contribution Calculation:

Metric	Formula	Result
Total Return Contribution	34.47% × 0.4116	13.17%
Total Risk Contribution	26.52% × 0.4116	10.92%

Interpretation

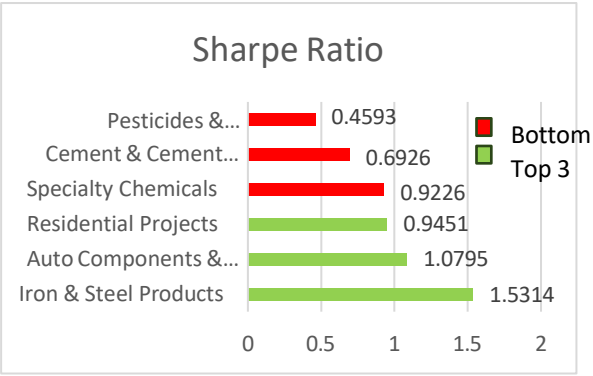
The selected six sectors, comprising 41.16% of the total portfolio, contributed approximately 13.17% to the overall portfolio return and 10.51% to the total portfolio risk. This indicates that:

- The sectors are relatively efficient contributors, generating a strong proportion of returns relative to their weight in the portfolio.
- Despite making up less than half of the portfolio, these sectors are responsible for nearly one-third of total returns, demonstrating their strategic value.
- The risk contribution (10.51%) is lower than the return contribution (13.17%), suggesting favourable risk-adjusted performance and diversification benefits.
- Particularly strong return drivers include Iron & Steel and Auto Components & Equipment's, while Pesticides & Agrochemicals had a modest return contribution with comparatively higher risk.

Overall, this sector allocation appears to be well-positioned, offering a good balance between return potential and controlled risk exposure within the fund's broader investment strategy.

4.8 Top vs Bottom Sector Performance Based on Risk-Adjusted Returns (Sharpe Ratio):

Based on the Sharpe Ratio, which measures risk-adjusted returns, the top and bottom 3 performing sectors from your data are as follows:



The top 3 sectors with the highest risk-adjusted returns are Iron & Steel, Auto Components, and Real Estate, indicating strong returns per unit of risk. The bottom 3—Agrochemicals, Cement, and Specialty Chemicals—delivered lower Sharpe Ratios, suggesting weaker efficiency in converting risk into return.

5.1 FINDINGS

The analysis of ICICI Prudential Midcap Direct Plan – Growth reveals key insights into sectoral performance, risk-return dynamics, and portfolio contribution. Below are the major findings presented in a structured, point-wise format:

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

- From all 6 sectors and 29 companies, iron & steel sector and its companies. The Iron & Steel sector achieved the highest annual return (53.24%).

- 3 outperforming sectors (iron & steel, residential, and auto components) and 3 underperforming sectors (cement, speciality chemcials and pesticides). The Iron & Steel sector recorded the highest Sharpe Ratio (1.53), while Agrochemicals had the lowest due to high risk and inconsistent returns.

- The fund's returns in most sectors, including Cement and Iron & Steel, outperformed the benchmark index, showing positive active management impact.

- Jindal Stainless Ltd (JIST) and APL Apollo contributed significantly to sector outperformance, reflecting effective stock selection or alpha.

- Cyclical sectors like Real Estate and Iron & Steel showed strong returns during bullish phases but had high market sensitivity (beta > 1.0).

5.2 SUGGESTIONS

Based on the performance analysis of ICICI Prudential Midcap Direct Plan – Growth, the following strategic suggestions are proposed to optimize returns while maintaining a balanced risk profile:

- Balance the portfolio by combining high-return but volatile sectors like Iron & Steel with low-risk sectors like Cement to manage overall risk efficiently.

- Reallocate investments from underperforming sectors (low Sharpe Ratio) to top-performing ones to improve the fund's risk-adjusted return.

- Maintain overweight positions in sectors where the fund has outperformed the benchmark, and review lagging sectors for potential underweighting.

- Continue using bottom-up stock selection to capture alpha within sectors and consider reallocating from underperforming stocks with high beta.

- Implement a dynamic allocation strategy that increases exposure to cyclical sectors in bullish markets and shifts to defensive sectors during downturns.

5.3 CONCLUSION

The study reveals that ICICI Prudential Midcap Direct Plan – Growth has effectively leveraged sectoral diversification to deliver superior risk-adjusted returns. Top-performing sectors (Iron & Steel, Auto Components) justify their allocation with high Sharpe Ratios and alpha generation. Underperformers (Pesticides, Cement) require scrutiny, though they may offer value during sectoral rebounds. The fund's 41.16% analysed allocation contributed disproportionately to returns (13.17%) with controlled risk (10.51%), validating its strategic stock-picking approach.

For sustained growth, the fund should rebalance toward high-conviction sectors, maintain rigorous risk oversight, and align with India's mid-cap growth narrative (e.g., infrastructure, manufacturing). This strategy can enhance returns while mitigating volatility, ensuring long-term investor value.

BIBLIOGRAPHY

1. Treynor, J. L. (1965). How to rate management of investment funds. Harvard Business Review. (Introduced the Treynor Ratio; actual publication was not formally peer-reviewed.)
2. Jensen, M. C. (1967). The performance of mutual funds in the period 1945–1964. The Journal of Finance, 23(2), 389–416.
3. Fama, E. F. (1972). Components of investment performance measurement. The Journal of Finance, 27(3), 551–567.
4. Gupta, R. (1989). Performance evaluation of mutual funds in India: A risk-return analysis. Unpublished dissertation.
5. Barua, S. K., & Varma, J. R. (1991). Mastershare: A case study on performance evaluation. Vikalpa, 16(1), 29–33.
6. Shome, D. (1994). Performance of growth-oriented mutual fund schemes. Unpublished report.
7. Bansal, L. K. (1996). Mutual Fund Management and Management. New Delhi: Deep and Deep Publications.
8. Carhart, M. M. (1997). On persistence in mutual fund performance. The Journal of Finance, 52(1), 57–82.
9. Gupta, A., & Sehgal, S. (1998). Investment performance of mutual funds: The Indian experience. ICFAI Journal of Applied Finance, 4(2), 21–34.
10. Rajeswari, T. R., & Rama Moorthy, V. E. (2001). An empirical study on factors influencing the mutual fund scheme selection by retail investors. Finance India, 15(2), 733–747.

ISSN: 2583-6129
DOI: 10.55041/ISJEM04781

11. Roshni Jayam. (2002). Investment behavior in equity mutual funds: Risk and return assessment. Unpublished study.
12. Priyadarshini, E., & Chandra Babu, A. (2011). Forecasting NAV of mutual funds using ARIMA models. International Journal of Research in Commerce, Economics & Management, 1(3), 93–97.
13. Bansal, S., Garg, D., & Saini, S. K. (2012). Performance evaluation of Indian mutual fund schemes using Sharpe and Treynor ratios. International Journal of Marketing, Financial Services & Management Research, 1(9), 90–100.
14. Narayanasamy, R., & Ratnamani, V. (2013, April). Equity fund performance in India: A statistical analysis. International Journal of Business and Management Invention, 2(4), 34–42.
15. Sharma, R., & Pandya, N. K. (2013). Mutual fund investment: A demographic analysis. International Journal of Research in Commerce and Management, 4(6), 53–56.
16. Vanaja, V., & Karuppasamy, R. R. (2013). A performance evaluation of private sector balanced mutual fund schemes. Asian Journal of Research in Business Economics and Management, 3(8), 36–49.
17. Paul Sundar, J. (2013). Investor behavior: Relationship between risk perception and safety preferences. Unpublished survey study.
18. Veeraiah, K., & Kishore Kumar, A. (2014). Comparative performance analysis of selected mutual fund schemes in India. Journal of Commerce & Management Thought, 5(1), 36–46.
19. Sharma, R. (2015). Motivations and preferences among mutual fund investors. International Journal of Business and Administration Research Review, 2(11), 56–62.

.