

A Study on the Smart Portfolio Construction and Optimization Using Sectoral Analysis and Risk Profiling

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ABSTRACT - This research investigates smart portfolio construction using sectoral analysis and investor risk profiling, focusing on the Indian equity market. The study selects 12 stocks from four key sectors-IT, Banking, Pharma, and FMCG between January 2022 and December 2024. Risk and return were calculated using standard deviation and mean returns, and the Sharpe Ratio was applied to assess performance. Sector-wise mini-portfolios were built and optimized based on investor risk tolerance (aggressive, moderate, conservative). The analysis reveals that Pharma and FMCG sectors provide better risk-adjusted returns, while IT offers high returns at higher risk. The findings help tailor portfolios based on sector dynamics and investor profiles.

KeyWords: Portfolio Optimization, Sectoral Analysis, Sharpe Ratio, Risk Profiling, Equity Investment, Indian Stock Market

1.INTRODUCTION

Portfolio optimization is a critical aspect of investment management aimed at maximizing returns while minimizing risks. In the Indian financial landscape, sectoral performance greatly influences investor decision-making. The present study focuses on constructing optimized portfolios based on sectoral performance and aligning them with different investor risk profiles. The aim is to develop effective investment strategies suitable for conservative, moderate, and aggressive investors by utilizing sectoral risk-return characteristics.

2. NEED FOR THE STUDY

With increasing participation of retail investors and the volatility of Indian stock markets, there is a growing need for simplified and data-backed portfolio strategies. This study addresses the practical challenge of customizing portfolios based on sector performance and investor risk profiles, making financial planning more efficient.

2.1 SCOPE OF THE STUDY

This study includes equity stocks from four sectors: IT, Banking, Pharma, and FMCG. It does not consider other

asset classes such as mutual funds, debt instruments, or gold. The study period is limited to three years (2022–2024), and only stocks from Nifty sectoral indices are included.

2.2 REVIEW OF LITERATURE

Sharpe (1966) introduced the Sharpe Ratio, a popular metric used to measure risk-adjusted return. According to his findings, the Sharpe ratio allows investors to compare the excess return earned per unit of risk and is widely used to assess portfolio efficiency.

Markowitz (1952) in his Modern Portfolio Theory emphasized diversification across assets and sectors to minimize risk without reducing expected returns. His theory supports the idea of constructing optimized portfolios by considering the correlation between asset returns.

Gupta and Mehta (2017) conducted a study on sectoral indices and found that portfolios constructed using sector-specific stock analysis outperformed randomly selected portfolios. The study highlighted the importance of selecting sectors based on market trends and investor objectives.

Rani and Kaur (2019) studied the performance of selected stocks using Sharpe and Treynor ratios. Their research indicated that risk-adjusted performance helps in better decision-making, especially when comparing companies across different sectors.

Choudhary and Jain (2020) focused on investor profiling and found that investors with different risk appetites prefer different combinations of asset classes. The study recommended building portfolios based on the investor's risk type: conservative, moderate, or aggressive.

Sharma and Joshi (2021) evaluated portfolio performance using risk-return metrics and concluded that portfolio optimization using ratios like the Sharpe ratio leads to better investment outcomes, particularly in volatile markets.

2.3 STATEMENT OF THE PROBLEM

In today's dynamic stock market, investors face increasing uncertainty in making decisions about where to invest and how to balance return and risk. Many rely on assumptions or trends without analyzing sectoral behavior or their personal risk profile. This study aims to address how sector-wise mini portfolios and risk profiling can lead to better investment decisions compared to passive index investing.

2.4 OBJECTIVES OF THE STUDY

1. To assess the risk-return performance of selected sectoral stocks using key financial metrics such as average return, standard deviation.
2. To construct and evaluate sector-wise mini portfolios using selected stocks from IT, Banking, Pharma, and FMCG sectors.
3. To optimize the portfolios by maximizing the Sharpe ratio, thereby identifying the most efficient investments in terms of risk-adjusted return.
4. To suggest portfolio strategies based on investor risk profiles by classifying investors as conservative, moderate, or aggressive and aligning Portfolio Recommendations

Accordingly.

2.5 RESEARCH METHODOLOGY

- Data Source : NSE, Investing.com
- Study Period : Jan 1, 2022 to Dec 1, 2024
- Sample : 2 stocks from 4 sectors (3 per sector)
- Tools : MS Excel for return, risk (standard deviation), and Sharpe Ratio

Formulas Used :

- $\text{Return} = (P_1 - P_0) / P_0 \times 100$
- $\text{Sharpe Ratio} = (R_p - R_f) / \sigma_p$
- $R_f = 6\% (0.06)$ (assumed risk-free rate)

2.6 DATA ANALYSIS & INTERPRETATION

Table 1: Individual Stock Return, Risk, and Sharpe Ratio.

Sector	Stock	Return	Risk	Sharpe Ratio
IT	TCS	0.42	5.56	0.064
IT	Infosys	0.51	6.47	0.070

IT	HCL	1.77	5.36	0.321
Banking	HDFC Bank	0.63	4.58	0.122
Banking	ICICI Bank	1.50	3.04	0.465
Banking	Axis Bank	1.13	5.46	0.199
Pharma	Sun Pharma	2.25	5.73	0.370
Pharma	Dr Reddy's	1.55	6.65	0.225
Pharma	Cipla	1.55	4.62	0.297
FMCG	Hindustan Unilever	0.26	5.99	0.031
FMCG	ITC	2.29	5.59	0.396
FMCG	Britannia	1.07	6.48	0.157

Interpretation:

Among the 12 selected stocks, ICICI Bank showed the highest Sharpe ratio (0.47), indicating strong return relative to its risk. ITC, Sun Pharma, and HCL also demonstrated high Sharpe ratios, making them suitable for inclusion in optimized portfolios.

Sector-wise Mini Portfolios (Equal Weight: 33.33%)

Table 2: IT Sector Mini Portfolio

Stock	Return (%)	Risk (%)	Weight	Weighted Return	Risk Contribution
TCS	0.42	5.56	0.3333	0.14	3.44
Infosys	0.51	6.47	0.3333	0.17	4.65
HCL	1.77	5.36	0.3333	0.59	3.19
Total				0.90%	3.36% $\sqrt{11.28}$

Interpretation: The IT mini portfolio gave a return of 0.90% with a risk of 3.36%. HCL contributed most to portfolio return, while Infosys had the highest volatility.

Table 3: Banking Sector Mini Portfolio

Stock	Return (%)	Risk (%)	Weight	Weighted Return	Risk Contribution
HDFC Bank	0.63	4.58	0.3333	0.21	2.33
ICICI Bank	1.50	3.04	0.3333	0.50	1.02
Axis Bank	1.13	5.46	0.3333	0.38	3.32
Total				1.09%	3.01%

Interpretation: The Banking portfolio produced a higher return (1.09%) with the lowest portfolio risk (3.01%). ICICI Bank performed exceptionally well in terms of both return and Sharpe ratio.

Table 4: Pharma Sector Mini Portfolio

Stock	Return (%)	Risk (%)	Weight	Weighted Return	Risk Contribution
Sun Pharma	2.25	5.73	0.3333	0.75	3.44
Dr. Reddy's	1.55	6.65	0.3333	0.52	4.92
Cipla	1.55	4.62	0.3333	0.52	2.37
Total				1.79%	3.48%

Interpretation: Pharma had the highest portfolio return (1.79%). Though risk was slightly higher, all three stocks were good performers with stable Sharpe ratios.

Table 5: FMCG Sector Mini Portfolio

Stock	Return (%)	Risk	Weight	Weighted Return	Risk Contribution
HUL	0.26	5.99	0.3333	0.09	3.99
ITC	2.29	5.59	0.3333	0.76	3.49
Britannia	1.07	6.48	0.3333	0.36	4.67
Total				1.21%	3.77%

Interpretation: FMCG portfolio showed a decent return of 1.21% but with the highest risk (3.77%). ITC was the best performer in this portfolio.

Table 6: Benchmark Comparison (Sector Portfolios vs. Nifty Indices)

Sector	Portfolio Return (%)	Portfolio Risk (%)	Nifty Sector Return (%)	Nifty Sector Risk (%)
IT	0.90	3.36	0.79	5.30
Banking	1.09	3.01	0.92	3.32
Pharma	1.79	3.48	1.75	4.12
FMCG	1.21	3.77	1.35	4.17

Interpretation: All mini portfolios outperformed their respective Nifty sector indices in terms of risk-adjusted return (lower risk with equal or higher return). This supports the effectiveness of active stock selection and smart portfolio construction.

Table 7: Sharpe Ratio Summary by Sector

Sector	Portfolio Return (%)	Portfolio Risk (%)	Sharpe Ratio
IT	0.90	3.36	0.27
Banking	1.09	3.01	0.36
Pharma	1.79	3.48	0.50
FMCG	1.21	3.77	0.32

Interpretation: The Pharma portfolio had the highest Sharpe ratio, indicating the best risk-adjusted performance among all sectors. Though IT had higher volatility, its Sharpe ratio remained lower than Pharma and Banking. FMCG offered decent returns with moderate risk.

Portfolio Optimization Logic

In this study, **equal weights (33.33%)** were assigned to stocks within each sectoral portfolio for simplicity. This method is often used in practical scenarios for beginner-level investors.

For advanced optimization, models like:

- **Markowitz's Mean-Variance Model**
- **CAPM (Capital Asset Pricing Method)**

It can be used to assign weights based on return expectations, volatility, and covariances. These models can maximize the Sharpe ratio more efficiently.

Table 8: Investor Profile Allocation

Based on return, risk&Sharpe ratio rankings, the stocks were categorized for investor profiles.

2.7 FINDINGS

1. Among all 12 stocks analyzed, ICICI Bank achieved the highest Sharpe ratio (0.47), indicating that it provided the best return for the risk taken. ITC, Sun Pharma, and HCL Technologies also showed strong risk-adjusted performance.
2. The Pharma mini portfolio provided the highest portfolio return (1.79%) among all sectors, showing that the sector was strong over the 3-year period in terms of return generation.
3. The Banking sector portfolio showed the lowest overall portfolio risk (3.01%) while maintaining a high return (1.09%), making it suitable for investors seeking balance between risk and return.
4. When sector-wise portfolios were compared with their respective Nifty sectoral indices, all four mini portfolios provided either higher returns or lower

risk, proving that active stock selection within

Investor Type	Stock Recommendations	Rationale
Aggressive	HCL, ICICI Bank, Sun Pharma	High return, high Sharpe ratios, moderate to high risk
Moderate	Axis Bank, Cipla, ITC	Balanced risk-return trade-off
Conservative	TCS, HDFC Bank, HUL	Lower risk, modest return, stable performance

sectors can outperform passive index investing.

5. Based on investor risk profiling:

- Aggressive investors were recommended portfolios consisting of high-return, higher-risk stocks (HCL, ICICI Bank, Sun Pharma).
- Moderate investors were suited to stable performers (Axis Bank, Cipla, ITC).

- Conservative investors were best aligned with lower-risk stocks (TCS, HDFC Bank, HUL), even if the returns were modest.

2.8 LIMITATIONS OF THE STUDY

1. The study includes only 12 stocks from 4 sectors and does not cover other sectors or asset classes like mutual funds or gold.
2. The analysis is based on data from January 2022 to December 2024, so the results may not apply to other time periods.
3. Equal weight was given to each stock in the portfolio, which may not reflect real investor choices.
4. A fixed risk-free rate of 6%(0.06) was assumed, which may not match actual market conditions.
5. The study is based on past data, and future performance may be different.

2.9 SUGGESTIONS

1. Investors should focus on risk-adjusted performance, not just returns, and use ratios like Sharpe Ratio to guide stock selection.
2. Sectoral mini portfolios offer a practical way to diversify while focusing on growth-oriented sectors like Pharma and Banking.
3. Investor risk profiles must be considered while constructing portfolios. A one-size-fits-all investment strategy is not advisable.
4. Financial advisors and beginners can benefit from using equal-weighted portfolios based on sector and risk profiling as a simple yet effective strategy.
5. Future investment tools and platforms can integrate this model of sector analysis + investor profiling to give personalized portfolio suggestions.

3. CONCLUSIONS

The study confirms that sector-based portfolio construction, when aligned with investor profiling, results in better investment performance. Mini portfolios tailored to investor risk types show more efficiency than market index investing. Financial advisors can apply this model to create personalized investment strategies.

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