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A Study on Optimal Equity Portfolio in the Indian Capital Market

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Abstract: *This study evaluates optimal equity portfolio construction in the Indian capital market by applying the Sharpe Single Index Model. Data from 20 companies in the NIFTY 50 index are used to analyze risk-return relationships and identify companies for portfolio inclusion. The study concludes that constructing an optimal portfolio with selected stocks, such as Hero MotoCorp and Bharat Petroleum, based on their risk-adjusted returns, offers a strategy for maximizing returns with controlled risk.*

Keywords: Capital Market, Portfolio Optimization, Sharpe Single Index Model, Risk and Return, NIFTY 50, Equity Investment

I. INTRODUCTION

Equity portfolio management is a crucial aspect of investment strategies, as it requires balancing risk with expected returns. This study aims to design an optimal portfolio within the Indian stock market by applying quantitative models. By identifying equities with favorable risk-return characteristics, the study highlights practical approaches to portfolio construction in a rapidly evolving financial environment.

II. OBJECTIVES

1. To analyze the risk and return of selected securities in the NIFTY 50.
2. To construct an optimal portfolio using Sharpe's Single Index Model.
3. To assess the efficiency of constructed portfolios.
4. To identify key factors influencing equity portfolio performance.

III. LITERATURE REVIEW

Guru and Bagrecha (2022) applied Sharpe's Single Index Model to the Bombay Stock Exchange (BSE) Sensex 30 companies. They analyzed stock performance data from 2017 to 2021, calculating key metrics such as beta, excess returns, and the cut-off rate for each stock. The study found that stocks with higher Sharpe ratios tended to outperform others, making SIM an effective tool for risk management and selection of top-performing stocks. By identifying the cutoff rate, they were able to include only those stocks that maximized returns within acceptable risk parameters, offering insights into building optimal portfolios in volatile market conditions

Varadharajan et al. (2022) examined small-cap stocks on the NSE, using Sharpe's Single Index Model to construct a portfolio that balanced growth potential with minimized risk. The study found that small-cap stocks selected through SIM exhibited strong performance, often yielding higher returns compared to traditional asset selection methods. This research highlights the flexibility of SIM in adapting to various market segments, including small-cap equities, and supports its utility for investors seeking to build diverse, high-growth portfolios

Sandhar, Jain, and Kushwah (2018) conducted an in-depth study using Sharpe's Single Index Model to create an optimal portfolio of stocks listed on the National Stock Exchange (NSE). By analyzing the monthly closing prices of stocks in the NIFTY index from 2010 to 2016, they identified stocks that offered the best risk- adjusted returns. Their study demonstrated that Sharpe's SIM is effective in selecting stocks with the highest excess return-to-beta ratios, thus maximizing returns relative to risk. This research provides a practical framework for investors in the Indian capital market to construct well-optimized portfolios

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IV. RESEARCH METHODOLOGY

The study used secondary data from sources like NSE, MoneyControl, and Yahoo Finance, examining 20 NIFTY 50 stocks over a three-year period. The Sharpe Single Index Model guided the analysis, helping to rank stocks by their excess return-to-beta ratio.

SAMPLING:

Stratified random sampling selected stocks across industries.

STATISTICAL TOOLS:

- Standard deviation of market index.
- Systematic risk
- Unsystematic risk
- Sharpe's Single Index Model.

V. DISCUSSION AND RESULTS

KEY FINDINGS:

1. High-Performing Stocks: Hero MotoCorp and Mahindra & Mahindra exhibit high returns.
2. Risk Analysis:Maruti Suzuki and Cipla show low volatility, making them safer investments.
3. Beta and Volatility: Tata Motors and Bajaj Finance display high beta values, indicating potential for high returns with increased risk.
4. Portfolio Optimization: The optimal portfolio, constructed based on Sharpe's model, includes Hero MotoCorp, Bharat Petroleum, Mahindra & Mahindra, Maruti Suzuki, and ONGC.
5. Cut-Off Value : Stocks above the calculated cut-off point were selected for portfolio inclusion.

VI. CONCLUSION

Through quantitative analysis, this study identifies an optimized portfolio comprising five NIFTY 50 stocks. The chosen equities offer a balanced approach to achieving risk-adjusted returns. The findings suggest that Hero MotoCorp, Bharat Petroleum, Mahindra & Mahindra, Maruti Suzuki, and ONGC are well-suited for inclusion in an optimal portfolio due to their favorable Sharpe Ratios and risk profiles.

VII. LIMITATIONS

Data Constraints: Reliance on secondary data may affect accuracy. Market Volatility: Short-term fluctuations may influence outcomes.

Sector-Specific Risks: Unique risks across sectors might not be fully captured in the model.

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