
📄 Report : Portfolio strategies

Sharpe vs Drawdown – My Portfolio Recommendation

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1. Introduction

Portfolio construction is a balance between maximizing returns and minimizing risk. Three popular strategies are:

- **Mean-Variance Optimization (MVO):** Finds the portfolio with the maximum Sharpe ratio.
- **Risk Parity (Inverse Volatility):** Balances risk contributions across assets.
- **Equal Weighted (EW):** Simplest approach with equal allocation to each asset.

This report compares these strategies using a 5-year backtest on five NIFTY50 stocks (Reliance, HDFC Bank, Infosys, TCS, ITC).

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2. Efficient Frontier & Sharpe Ratio

- The **Efficient Frontier** shows the set of optimal portfolios for a given risk level.
- The **Sharpe ratio** measures excess return per unit of risk.
- Maximizing Sharpe ratio → identifies the optimal portfolio on the Efficient Frontier.

Key Insight:

- Higher Sharpe ratio = better risk-adjusted returns.
- But Sharpe does not directly account for **drawdowns** (large losses from peak).

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3. Allocation Comparison

Strategy	Allocation Summary	Key Features
MVO (Max Sharpe)	INFY ~65%, Reliance ~24%, HDFC ~12%, TCS/ITC ~0%	Concentrated allocation, highest Sharpe
Risk Parity	~19.5% median weight	Balanced risk contributions
Equal Weighted	20% per stock	Simplest, baseline comparison

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4. Performance Results (5-Year Backtest)

Strategy	Total Return	Annualized Return	Volatility	Sharpe Ratio
MVO (Max Sharpe)	141.7%	**19.3%**	1.04%	**18.5**
Risk Parity	86.3%	13.3%	0.91%	14.6
Equal Weighted	74.9%	11.8%	0.94%	12.6

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5. Sharpe vs Drawdown Analysis

- **MVO (Max Sharpe):**
    - Highest Sharpe ratio and returns.
    - Concentrated in Infosys → higher drawdown risk.
- **Risk Parity:**
    - More stable with lower volatility.
    - Drawdowns controlled by balancing across stocks.
- **Equal Weighted:**
    - Simplest, but least efficient.

- No optimization → weaker Sharpe ratio and returns.

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6. Recommendation

- If the investor's goal is **maximum returns and efficiency**, choose **MVO**.
- If the investor's goal is **capital protection and minimizing drawdowns**, choose **Risk Parity**.
- **Final Call:**
  - Recommend **MVO with constraints** (e.g., cap sector/stock weights at 30%).
  - This delivers strong risk-adjusted returns while mitigating concentration risk.
  - Risk Parity can serve as a fallback option for risk-averse investors.

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7. Conclusion

The comparative analysis shows that **MVO dominates in Sharpe ratio and total returns**, but at the cost of concentration risk. **Risk Parity** provides more balanced exposure and lower drawdown potential. A blended or constrained MVO approach represents the best compromise for long-term investors seeking both performance and stability.
