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COMPARATIVE ANALYSIS OF RISK-MINIMIZATION PORTFOLIOS WITH DIFFERENT CARDINALITY CONSTRAINTS AND REBALANCING PERIODS

Abstract:

This paper presents an empirical performance comparison of portfolios optimized to minimize various risk measures while incorporating a cardinality constraint. The risk measures evaluated include standard deviation, semi-deviation, minimax, mean absolute deviation, maximum drawdown, conditional value at risk (CVaR), and entropic value at risk (EVaR). Different cardinality constraints and lengths of rebalancing period are introduced to assess their impact on portfolio optimization. Our analysis offers a comprehensive comparison by simultaneously considering the risk measure, cardinality constraint, and rebalancing period length. Moreover, we assess portfolio performance under diverse market conditions, specifically focusing on the U.S., German, and Chinese stock markets. The performance is measured using the Sharpe, Sortino, and Calmar ratios. The results demonstrate that no single risk measure consistently outperforms the others, highlighting significant differences across measures. While the optimal length of the rebalancing period varies across risk measures, certain consistent patterns emerge from the findings.

Keywords:

risk minimization
cardinality constraint
portfolio optimization
risk measures

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