Università
Ca'Foscari
Venezia

Homework 2 – Methods for Personal Portfolio Management
Academic Year 2024/25

Tasks:

Use the first 200 daily logarithmic returns to determine the portfolio composition using the Markowitz approach with Particle Swarm Optimization (PSO). Assume short selling is not allowed and test at least three different parameter settings for P, niter, K, and epsilon1. Analyze the selected portfolio's composition. Then, use the remaining returns (from the 201st onward) to calculate the future performance (mean and variance) and compare it with the portfolios selected in Homework 1 using the Markowitz approach and those from the first task of this document.

Use the first 200 daily logarithmic returns to determine the portfolio composition using the Mean-Variance model with mixed-integer constraints and PSO. Test at least three different parameter settings for P, niter, K, and epsilon1. Analyze the selected portfolio's composition. Then, use the remaining returns (from the 201st onward) to calculate the future performance (mean and variance) and compare it with the portfolios selected in Homework 1 using the Markowitz approach and those from the first task of this document.

Use the entire time series of daily logarithmic returns to calculate the Value at Risk (VaR) and Expected Shortfall (ES) for each series. Then, determine the efficient sets of assets using the mean-VaR and mean-ES criteria. Compare these results with the mean-variance and mean-semivariance criteria used in Homework 1 and discuss the findings.