DBA5106 FOUNDATION OF BUSINESS ANALYTICS

PROJECT 2: BONUS PART

Portfolio Optimization Analysis

Group 12

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Bonus: Is the Chosen Portfolio Better than LASSOCV or RidgeCV Using New Data?

1. **Objective**

As part of the bonus requirement, we revisit our Project 1 portfolio selection using the updated dataset and evaluate whether our chosen strategy outperforms the baseline LASSOCV and RidgeCV models when all strategies are subjected to the same rolling-window backtest.

The start date for the train is taken as “2023-07-03” for all the strategies.

The comparison is conducted on a strict unseen out-of-sample (OOS) test window beginning:

Test Period: 1 August 2025 → 30 September 2025

2. **Methodology**

To ensure a fair comparison:

(A) Rolling Window Backtesting Framework:

All strategies are evaluated using:

- Rolling 126-day training window, advancing daily.
- At each OOS date t, the model is trained using data from t–126 to t–1 only.
- Model selection and parameter tuning occur within this rolling window (inner validation).
- We record the daily OOS return on date t using weights derived solely from historical data.

(B) Models Compared

1. Chosen Model (from Project 1)
    - Stacked + Denoised PCA ensemble (k=10 for denoising)
    - PCA(k) + Ridge / PCA(k) + LASSO candidates
    - Best model chosen each day via validation Sharpe
    - Rolling daily re-estimation

2. Baselines
    - EW + LASSOCV (regression reframe)
    - EW + RidgeCV (regression reframe)
    - MinVar, MinVar+Ridge, MinVar+LASSO
    - Equal-Weight (EW)

3. **Results**: Daily Sharpe (Strict OOS from 1 August 2025)

Model Daily Sharpe Values(Aug 1 – Sep 30, 2025):
Chosen Model (Stacked+Denoised): 0.308
EW: 0.146
MinVar (plain): 0.082
EW + LASSO (reg): 0.273
EW + Ridge (reg): 0.275
MinVar + Ridge (γ=0.001): 0.110
MinVar + LASSO (γ=0.001): 0.130

Interpretation:
Our chosen model delivers a daily Sharpe of 0.308, which is strictly higher than both: LASSOCV (0.273) & RidgeCV (0.275)

Thus, on new unseen data, and under the same rolling-window evaluation, the chosen stacked-denoised portfolio delivers stronger risk-adjusted performance than both LASSOCV and RidgeCV.