

Final report of AFFANZ GRANT

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Project Title: Improving mean-variance portfolio using a new estimator for optimal hedging relations

Project summary: In mean-variance portfolio optimization, the inverse covariance matrix determines the optimal hedging relations among stocks, with each row of the matrix representing a hedge regression for a stock. This project proposes a new estimator for inverse covariance matrix, by shrinking coefficients in each hedge regression towards zero and dropping redundant stocks from the portfolio. The goal is to improve the estimation of optimal hedge relations particularly for a large panel of stocks, leading to improvements in out-of-sample mean-variance portfolio performance. We propose to verify the benefits of this new estimator by comparing it with a set of existing counterparts. The new estimator would jointly solve two critical issues in practical applications of the mean-variance portfolio strategy: estimation error and portfolio instability.

Funds Granted: AU\$5000

Detailed report on the expenditure of funds:

Research assistance for the construction of large datasets. (100 hours x \$50 per hour) The proposed research requires the construction of several large datasets. For comparison of the sparse estimator with other competing counterparts, a range of large data sets must be constructed, particularly a large panel of high frequency return data must be constructed using transaction level data available from SIRCA. Established methods to construct such measures requires downloading and cleaning large volumes of data. In the meantime, a large panel of stock returns at a daily frequency must also be constructed.

2500.00

Research assistance for the programming of the model comparison. (50 hours x \$50 per hour) This project involves a large set of simulation studies to verify the merit of sparse estimator. A research assistant would be of great help to conduct programming for it under our clear instructions.

Future Intention for this project

The paper aims to submit to a top Journal

Summary of Outcomes and Benefits:

Collaboration - The benefits of collaboration on this project are twofold. Firstly, the mid-career researcher has a strong technical background in (inverse) covariance matrix estimation, but less experience with applied work especially in portfolio allocation. The established researcher is very experienced in this area. Secondly, the mid-career researcher finished her PhD within five years and would greatly benefit from working with someone more experienced.

Risk assessment - Moderate competitor risk due to the level of active research in the field. Given the verified merit of naive diversification from previous studies, there remains some risk that the proposed estimator cannot help the mean variance portfolio to beat the 1/N portfolio.