

The Hong Kong University of Science and Technology

Seminar on Business Data Science

Department of ISOM

**The cost of including the risk-free asset in
portfolio optimization**

by

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Date: 13 October 2026 (Tuesday)

Time: 11:00am – 12:00nn

Venue: Room 4047 (LSK Business Building)

Abstract

Portfolio theory prescribes that a mean-variance investor should always combine the risk-free asset with the tangency portfolio of risky assets. We show that this prescription can fail once the optimal portfolio must be estimated from data. Adding the risk-free asset introduces an additional weight to estimate, and the estimation error in that weight can outweigh the benefit of the risk-free asset. We derive closed-form expressions for the expected out-of- sample utility of the estimated optimal portfolios with and without the risk-free asset. Discarding the risk-free asset is preferable if and only if the investor's risk aversion lies in an interval around the risk aversion at which the two population portfolios coincide, and we characterize this interval in closed form. The interval is wide for realistic parameter values and it widens as the length of the estimation window decreases, as the number of risky assets increases, and as the risky assets become more attractive. The conclusions survive when, instead of plug-in portfolios, the investor uses portfolio rules that account for estimation risk.

Bio

Nathan Lassance is an Associate Professor of finance at UCLouvain in Belgium. He works on parameter uncertainty and its consequences for portfolio selection and asset pricing. His research has been published in Management Science, Operations Research, Journal of Financial and Quantitative Analysis, Review of Finance, and Journal of Business & Economic Statistics.

All interested are welcome!

For details, please contact ISOM Department.