# Swissquote Conference 2017 on FinTech

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**Title: Effective sample bias correction for minimum variance portfolios**

**Abstract:** Estimation error has plagued quantitative finance since Markowitz launched modern portfolio theory in 1952. Using random matrix theory, we characterize a source of bias in the sample eigenvectors of financial covariance matrices. Unchecked, the bias distorts weights of minimum variance portfolios and leads to risk forecasts that are severely biased downward. To address these issues, we develop an eigenvector bias correction. Our approach is distinct from the regularization and eigenvalue shrinkage methods found in the literature. We provide theoretical guarantees on the improvement our correction provides as well as estimation methods for computing the optimal correction from data.

*This work is in collaboration with Alex Papanicolaou and Alex Shkolnik.*