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A comparative simulation study of two enhancements to portfolio optimization: Shrinkage and clustering

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Abstract

Through simulation, this thesis investigates two enhancements to minimum vari- ance portfolio estimation by comparing the methods presented in De Prado (2016) with Bodnar, Parolya, and Schmid (2018). A shrinkage methodology is presented from Bod- nar, Parolya, and Schmid (2018), while a clustering methodology - Hierarchical Risk Parity (HRP) - from De Prado (2016) is presented. The estimators were evaluated in experiments to investigate the effect of number of observations, number of assets, vari- ance, condition number and correlation. The results show that the method of Bodnar, Parolya, and Schmid (2018) performs relatively consistent while HRP generates higher errors with higher spreads. The errors of HRP show a strong relationship with asset correlation.

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