Doctor of Business Economics

Essays on Portfolio Optimization with constraints

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Abstract

The thesis contains four self-contained but thematically linked studies on the equity-based portfolio optimization with constraints. The studies concern situations where investors face limitations that challenge the classical assumptions. The studies incorporate combinations of such investor-constraints including investor risk limits, cardinality, non-normal return distributions, and ethical (belief-based) restrictions. The four studies introduce performance-sharing mechanism for risk-limited investors, continuous sparse particle swarm optimization for cardinality and non-normal return distribution scenarios, Islamic alter ego of Dow Jones industrial average for Muslim investors using explainable AI, and a balancing approach between diversification and active factor exposures harvesting in small cardinality smart beta portfolios. The studies provide simple, explainable and applied solutions to given constrained optimisation problems.