Optimal Portfolios from Ordering Information

Robert Almgren
University of Toronto

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Abstract

Modern portfolio theory produces an optimal portfolio from estimates of expected returns and a covariance matrix. We present a method for portfolio optimization based on replacing expected returns with *sorting criteria*, that is, with information about the order of the expected returns but not their values. We give a simple and economically rational definition of optimal portfolios that extends Markowitz' definition in a natural way; in particular, our construction allows full use of covariance information. We give efficient numerical algorithms for constructing optimal portfolios. This formulation is very general and is easily extended to more general cases: where assets are divided into multiple sectors or there are multiple sorting criteria available, and may be combined with transaction cost restrictions. Using both real and simulated data, we demonstrate dramatic improvement over simpler strategies. [Joint work with Neil Chriss, SAC Capital]