

Simulation-based Parametric Optimization for Long-Term Asset Allocation using Behavioral Utilities

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Abstract

This article presents a simulation-based methodology for finding optimal investment strategy for long-term financial planning. The problem becomes intractable due to its size or the properties of the utility function of the investors. One approach is to make simplifying assumptions regarding the states of the world and/or utility functions in order to obtain a solution. These simplifications lead to the true solution of an approximate problem. Our approach is to find a good approximate solution to the true problem. We approximate the optimal decision in each period with a low dimensional parameterization, thus reformulating the problem as a nonlinear, simulation-based optimization in the parameter space. The dimension of the reformulated optimization problem becomes linear in the number of periods. The approach is extendable to other problems where similar solution characteristics are known.

Keywords: Simulation-based Optimization, Long-term Asset Allocation, Parametric Approximation