Abstract

We consider the problem of maximizing an expected utility function of n assets, such as the mean-variance or power utility function. Associated with a change in an asset's holdings from its current or target value is a transaction cost. That must be accounted for in practical problems. To more accurately formulate the transaction costs, we use a model with K purchase and K sales transaction costs functions which depend on the size of the transaction. A straightforward way of accounting for these costs results in a $(2K + 1)n$—dimensional optimization problem with $(4K + 1)n$ additional constraints. This higher dimensional problem is computationally expensive to solve. We present a method for solving the $(2K + 1)n$—dimensional problem by solving a sequence of n—dimensional optimization problems, which account for the transaction costs implicitly rather than explicitly. The method is based on deriving the optimality conditions for the higher dimensional problem solely in terms of lower dimensional quantities.