

Optimal portfolio selection with spectral risk measure under AR(1) – copula model

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Abstract

In this article, a portfolio selection problem with spectral risk measure is considered. The dynamics of the returns of each underlying asset is modeled by an autoregressive model of order 1. The tail dependence structure of the underlying asset-return vector is depicted by a copula function. The technique of linear programming is employed to solve the optimal asset allocation. Empirical studies are conducted for investigating the impact of the degree of risk aversion, the level of autocorrelation and the tail dependence for underlying assets on the portfolio selection problem based on the component stocks of the Taiwan 50 Index. Numerical results indicate that aggressive investors have higher income during a period of economic prosperity while conservative investments have less losses during a recession. However, these phenomena are unapparent if the tail dependence for underlying assets is large. In addition, an aggressive investment strategy receives higher earnings in an economic recovery if underlying returns are negatively autocorrelated.

Keywords: copula, portfolio selection, spectral risk measure