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Optimal portfolio selection problem under relative return concerns.

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Summary: In this paper we investigate a continuous-time optimal portfolio selection problem for a risk-averse investor based on a relative log-return. Investor can invest her wealth in a risk-free asset and a risky stock. The objective of the investor is to exceed the performance of a stochastic benchmark that is not perfectly correlated with the risky stock. Investor chooses a dynamic portfolio strategy in order to maximize her expected terminal utility of the weight sum of absolute log-return and relative log-return. By using the dynamic programming principle, the corresponding Hamilton-Jacobi-Bellman equation of the optimal portfolio strategy and the value function is established. Furthermore, closed-form expressions of the optimal portfolio strategy and the value function under the investor with an exponential utility function are derived. The effect of the relative return on the optimal portfolio strategy is also analyzed. The result shows that the relative return works against the investor’s intrinsic risk-taking tendency. Finally, numerical examples are provided to illustrate how the optimal portfolio strategy and the value function change when some model parameters vary.

MSC:

91G10 Portfolio theory

Keywords:

optimal portfolio selection; stochastic benchmark; absolute return; relative return; Hamilton-Jacobi-Bellman equation

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