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Safety First Portfolio Selection, Extreme Value Theory and Long Run Asset Risks

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Extreme Value Theory and Applications

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Abstract

The paper motivates the use of the statistical extreme value theory for the problem of portfolio selection in economics, both theoretically and empirically. It is shown that the conventional safety first criterion developed by Roy can be successfully improved upon by exploiting the fat tail property of asset returns. Extreme value theory is seen to provide a better bound than the Chebyshev bound. In the empirical application we calculate minimum threshold return levels given very low exceedance probabilities for bond and equity investors. A proof of a new quantile estimator is obtained in the appendix. The data cover at least a half-century of returns and allow for evaluation of investment risks in the long run.

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