

Investments for the Short and Long Run

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This paper aims to discuss the optimal selection of investments for the short and long run in a continuous time financial market setting. First it documents the almost sure pathwise long run outperformance of all positive portfolios by the growth optimal portfolio. Secondly it assumes that every investor prefers more rather than less wealth and keeps the freedom to adjust his or her risk aversion at any time. In a general continuous market, a two fund separation result is derived which yields optimal portfolios located on the Markowitz efficient frontier. An optimal portfolio is shown to have a fraction of its wealth invested in the growth optimal portfolio and the remaining fraction in the savings account. The risk aversion of the investor at a given time determines the volatility of her or his optimal portfolio. It is pointed out that it is usually not rational to reduce risk aversion further than is necessary to achieve the maximum growth rate. Assuming an optimal dynamics for a global market, the market portfolio turns out to be growth optimal. The discounted market portfolio is shown to follow a particular time transformed diffusion process with explicitly known transition density.

Assuming that the transformed time growth exponentially, a parsimonious and realistic model for the market portfolio dynamics results. It allows for efficient portfolio optimization and derivative pricing.