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Continuous-time model for household portfolios

We develop a continuous-time model for a Merton-like household portfolio choice problem in which the investor is subject to undiversifiable income risk. A mean-reverting factor predicts excess return of the stock, and wealth must be allocated among investments and consumption. The investor's goal is to maximize the utility of lifetime consumption in the presence of short-sales and borrowing constraints. Using techniques of stochastic optimal control, we derive a non-linear PDE with an internal free boundary. For a reduced problem, we obtain numerical solution for the value function and thus for the optimal portfolio policies. [Joint work with Raymond Cheng]