Problem Set 10

ECON 337901 - Financial Economics — Peter Ireland
Boston College, Department of Economics — Spring 2024

Due Tuesday, April 9

1. Risk Aversion and Portfolio Allocation, Part I

Consider a portfolio allocation problem that is a special case of those we studied in class. An investor has initial wealth $Y_0 = 100$. The investor allocates the amount a to stocks, which provide return $r_G = 0.30$ in a good state that occurs with probability $1/2$ and return $r_B = 0.05$ in a bad state that occurs with probability $1/2$. The investor allocates the remaining $Y_0 - a$ to a risk-free bond, which provides the return $r_f = 0.10$ in both states. Assuming that the investor has vN-M expected utility, with Bernoulli utility function of the logarithmic form

$$u(Y) = \ln(Y),$$

calculate the optimal amount a^* that the investor should allocate to stocks.

2. Risk Aversion and Portfolio Allocation, Part II

Re-solve the portfolio allocation problem from question 1, above, assuming that instead of taking the logarithmic form, the investor's Bernoulli utility function is

$$u(Y) = \frac{Y^{1-\gamma} - 1}{1 - \gamma}$$

with $\gamma = 2$, or more simply,

$$u(Y) = \frac{Y^{-1} - 1}{-1} = -\frac{1}{Y} + 1.$$

Which investor is more risk averse: the investor from question 1 or the investor from question 2? Which investor allocates more of his or her wealth to stocks?