Problem Set 3

February 27, 2012

Assuming that the individual is a von Newmann-Morgenstern expected utility maximizer, she chooses her portfolio by maximizing the expected utility of end-of-period wealth:

$$\max_A E[U(\tilde{W})] = \max_A E[U(W_0(1+r_f) + A(\tilde{r} - r_f))] \tag{1}$$

The solution to the individual's problem above must satisfy the following F.O.C with respect to A:

$$E[U'(\tilde{W})(\tilde{r} - r_f)] = 0 \tag{2}$$

Using the envelope theorem, we can differentiate the F.O.C to obtain

$$\frac{dA}{dW_0} = \frac{(1+r_f)E[U''(\tilde{W})(\tilde{r} - r_f)]}{-E[U''(\tilde{W})(\tilde{r} - r_f)^2]} \tag{3}$$

prove that the more wealthy individual invests a smaller dollar amount in the risky asset if utility is characterized by increasing absolute risk aversion.

Bonus question. Show that an individual with increasing relative risk aversion invests proportionally less in the risky asset as her initial wealth increases.

The Problem 3 is due to Mar, 7th.