

Problem Set # 5

Due 10/16/09

1. Text Problem 7.5.
2. Text Problem 7.8.
3. Text Problem 7.12
4. Consider the quadratic utility function $U(W) = aW - bW^2$ where a and b are positive parameters.
 - a. What constraints need to be placed on the parameters a and b to ensure that the marginal utility of wealth is positive?
 - b. Does this function exhibit increasing or decreasing risk aversion?
 - c. Suppose that this person is considering investing in a risky asset. One dollar invested in this asset will yield $1 + r$ dollars at the end of one period, where r is a random variable with $E(r) = \bar{r} > 0$ and variance given by σ_r^2 . Any funds not invested in this asset will have an unchanged value at the end of this one period (that is, the risk-free rate of return is zero). How will this person's next period's wealth depend on the fraction (k) of current wealth he or she invests in the risky asset?
 - d. How should this person choose k to maximize the expected utility of his or her next period's wealth? (Note: to answer this part you will have to know the mathematical identities that for any random variable, x ,
 $E(kx) = kE(x)$, $Var(kx) = k^2Var(x)$, and $E(x^2) = \sigma_x^2 + [E(x)]^2$ -- see chapter 2 and Problem 2.14.
 - e. Explain explicitly how your optimal value for k here depends on this person's initial level of wealth. Does this seem consistent with real world observations?