Assignment 2 - Math 772
Optimal Investment, Risk Measures and Pricing in Incomplete Markets

25/01/2006

1. This exercise refers to equilibrium in a one-period market. Consider a finite sample space $\Omega = \{\omega_1, \omega_2, \omega_3, \omega_4\}$.

- For the case of four different securities with prices $S = (S^1, S^2, S^3, S^4)$, construct an example of a 4×4 matrix $D_{ij} := S_T^i(\omega_j)$ corresponding to a complete market.
- Consider ten different agents in this market, all with different utility functions (say some with a log utility, some with exponential utilities for differetn values of γ and some with power-law utilities with different values of δ and obtain the equilibrium prices for the securities according to the numerical algorithm discussed in class.

2. Consider a binomial tree in with parameters (u, d, p, r) in a 2-period model. Obtain the optimal investment strategy in this complete market for the case of a log, exponential and power-law utility.

3. Consider a trinomial tree in with parameters (u, d, p_1, p_2, r) in a 2-period model. Obtain the optimal investment strategy in this incomplete market for the case of a log, exponential and power-law utility.