

IEOR E4706: FE: Discrete-Time Asset Pricing (Fall 2004)
Columbia University
Instructor: Martin Haugh
Assignment 3: Due Tuesday October 12th

Question 1

Do Exercise 3 in the *Forwards, Swaps and Futures* lecture notes.

Question 2

Do Exercise 4 in the *Forwards, Swaps and Futures* lecture notes. (You only need to write a few lines to answer this question.)

Question 3

Referring to Examples 1 and 2 of the *Martingale Pricing Theory* lecture notes, show that

$$\begin{bmatrix} \pi_1 \\ \pi_2 \\ \pi_3 \\ \pi_4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0.3102 \\ 0.4113 \\ 0.2682 \end{bmatrix} + \epsilon \begin{bmatrix} 0.7372 \\ -0.5898 \\ -0.2949 \\ 0.1474 \end{bmatrix}$$

is also a vector of state prices for any ϵ such that $\pi_i > 0$ for $1 \leq i \leq 4$.

Question 4

What elementary securities are attainable in the model of Example 1 of the *Martingale Pricing Theory* lecture notes? Is this model complete or incomplete? Explain your answer.

Question 5

Suppose a vector of positive state prices exists for a given single-period model as described in the *Martingale Pricing Theory* lecture notes. Show that no arbitrage opportunities can exist.