

Lab Report #??

(Started: July 19, 2011; Revised: January 19, 2012)

Due at the start of class. You may speak to others, but whatever you hand in should be your own work.

1. (two-state Markov chain) Consider a two-state chain with transition matrix

$$P = \begin{bmatrix} (1-\rho)p + \rho & (1-\rho)(1-p) \\ (1-\rho)p & (1-\rho)(1-p) + \rho \end{bmatrix}$$

based on parameters $0 < p < 1$ and $-1 < \rho < 1$.

- (a) Verify that this is a legitimate transition matrix? (What are the requirements for this?)
 - (b) What are the two-period transition probabilities? Three-period probabilities?
 - (c) What is the invariant distribution?
 - (d) What are the eigenvalues of P ?
 - (e) ??
2. (discounting dividends) We'll use the same Markov chain as in question 1 with $\rho = 2/3$ and $p = 1/3$. Suppose the dividend on an asset is one in state 1 and two in state 2. The discount factor is $q = 2/3$.
- (a) What is the one-period riskfree interest rate?
 - (b) What is the invariant distribution? What is the (unconditional) mean dividend?
 - (c) What is the discounted value of expected dividends?
 - (d) Price asset recursively. Let the price be $q^e(1)$ in state 1 and $q^e(2)$ in state 2. [??]
What are these prices?
 - (e) Suppose returns are $r' = (d' + q')/q$. What are the returns? [??]