Asset Pricing Theory Problem Set 1

Due: Before the next lecture

1. Suppose we live in a two-state world with a financial market. In the market we have a stock with current price 100. In the next period, the stock either rises to 112 or declines to 84. We also have a European call option on the stock maturing next period with strike price 98 and current price 10.

(1) Is this market complete? Why?

(2) Show that this option implies a riskfree rate of 5% using no-arbitrage argument.

(3) Calculate state prices.

(4) Calculate risk-neutral probabilities.

(5) If we know that it is equally probable for the stock to rise or fall, calculate the stochastic discount factor.