I. Module 2 Homework 2 [practice]: Meet the Binomial Model

Due No due date **Points** 4 **Questions** 4 **Time Limit** None
Allowed Attempts 2

Instructions

The binomial model is really useful in asset pricing. Suppose that there are two states tomorrow,"up" and "down," and each can happen with probability 1/2. Consumption is $c_t = 1$ today, $c_{t+1}(u) = 2$ in the up state and $c_{t+1}(d) = 1/2$ in the down state. Assume $\gamma = 1$, $\beta = 1$ and power utility $u'(c) = c^{-\gamma}$.

This assignment introduces the binomial setup. I set it up so the payoffs are very symmetric, yet the model generates very asymmetric prices and expected returns. Ponder why.

Start by writing down a general asset pricing formula. If a payoff is $x(u)$ and $x(d)$ in the up and down states at time $t+1$, write a formula for its price at time t. Then you can do the examples that follow.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	5 minutes	4 out of 4

Correct answers are hidden.

Submitted Jun 12 at 10:08pm

Question 1 — 1 / 1 pts

Find the price of a bond -- an asset that pays 1 in each state.

Enter your answer as a decimal -- The grading machine doesn't know that 1/2 = 0.5, so enter 0.5 if you want to answer 1/2.

Note: This is a "Numerical Answer" question. Your answer will be marked as correct, if it is within a margin of error.

1.25

Hints: p = probability of up state x u'(up state)/u'(ct) x payoff in up state + probability of down state x u'(down state)/u'(ct) x payoff in down state.

The probabilities are 1/2 and 1/2. u'(c) = 1/c. For a bond, the payoffs are 1 in each state.

Question 2

1 / 1 pts

Find the price of contingent claims -- an asset U that pays $1 in the up state and $0 in the down state, and a different asset D that pays $0 in the up state and $1 in the down state.

What is the price of contingent claim in the up state?

Note: Questions 2-3 are "Numerical Answer" questions. Your answer will be marked as correct, if it is within a margin of error.

0.25

Question 3

1 / 1 pts

What is the price of contingent claim in the down state?

1

Question 4

1 / 1 pts

Compare assets U and D. Check the correct options, and leave blank the incorrect options.

- [x] U and D have the same expected payoff.
- [x] U and D have the same variance of payoff.
- [ ] U and D have the same expected return.
- [ ] U and D have the same price.

Expected payoff is not the same as expected return.