

Practice Problem Set 1
Intertemporal Choice (C.10), Uncertainty (C.12)

Question 1.1

Margaret has a utility function $U(c_1, c_2) = c_1 + c_2$ (Hint: this implies that she does not care whether she consumes in period 1 or period 2), where c_1 and c_2 are denoted in dollar units. Her initial endowment is \$20 in period 1 and \$40 in period 2.

Margaret is given an opportunity to buy a stock for \$12 in period 1, which she can sell for \$20 in period 2. Otherwise, she derives no utility from owning the stock. She can only buy one unit of the stock, if she buys at all.

- i) If Margaret cannot borrow or lend, should she invest in the stock? Why or why not?
- ii) Suppose that Margaret can borrow and lend at an interest rate of 50%. Should she invest in the stock? Why or why not?

Question 1.2

The *certainty equivalent* of a lottery is the amount of money you would have to be given with certainty to be just as well-off with that lottery. Suppose that your expected utility function over lotteries that give you an amount x if Event 1 happens and y if Event 1 does not happen is $EU = \pi\sqrt{x} + (1 - \pi)\sqrt{y}$, where π is the probability that Event 1 happens and $1 - \pi$ is the probability that Event 1 does not happen.

- i) If $\pi = 0.5$, calculate the utility of a lottery that gives you \$10,000 if Event 1 happens and \$100 if Event 1 does not happen.
- ii) If you were sure to receive \$4,900, what would your utility be?
- iii) Calculate the certainty equivalent of receiving \$10,000 if Event 1 happens and \$100 if Event 1 does not happen.

Question 1.3

Suppose that you are a merchant in the ancient world. You have bought some goods from overseas and have been waiting a long time for your ship to arrive.

There is a 25% chance that it will arrive today. If it does arrive today, your wealth will be \$1,600. If it does not come in today, it will never come and your wealth will be zero. Your utility function is \sqrt{w} , where w is wealth. What is the minimum price at which you should sell the rights to your ship?