

SUNY-Stony Brook. Economics Department
Economics 323: Fall 2011
Professor Hugo Benítez-Silva

Suggested Answers to Sample Questions for Midterm 1 (October 6th)

1. **True or False.** Remember that in the exam credit will only be given for justified answers.

a) In a graph that has current consumption on the horizontal axis and future consumption on the vertical axis, the horizontal intercept of the budget line is the present value of all one's income in the two periods. **True or False**

True, straight from class notes. In the exam you should draw it and explain.

b) An increase in the interest rate can make a utility-maximizing lender become a borrower. **True or False**

False, a lender gains by an increase in interest rate, would never want to borrow money.

c) When comparing investments the NPV and the IRR always give the same ordering in terms of which project to choose. **True or False**

False, we had an example in class that an investment with a higher NPV actually had a lower IRR since the later does not take into account the timing of the income stream

d) If the value of investing now is measured by NPV_1 , the value of waiting until next period due to the price uncertainty is measured by NPV_2 , the difference in these two NPVs must go down if the probability of having the high price next period becomes higher, keeping the average expected price unchanged. **True or False**

Using a rationale similar to a question in PS2 and the notes this is True. If the good outcome is more likely, the advantage of waiting goes down, this will be reflected in NPV_2 which will be closer to NPV_1 .

2. A friend of Harvey's

I always thought my good friend Alex was quite original given his choices. He then once told me his utility function was $U(c_1, c_2) = \min \{c_1, c_2\}$ where c_1 and c_2 are his consumption in period 1 and 2 respectively. I know in the first period he earns \$168 thousand and \$105 thousand in period 2. Alex can borrow or lend at an interest rate of 10%. Inflation is negligible. What will he do?

- a) Alex will save 30 thousand dollars
- b) Alex will borrow 30 thousand dollars
- c) Alex will neither borrow nor lend.
- d) Alex will save 133 thousand dollars
- e) Alex will saved all his money, studied an MBA in Boston, marry Jane and invite me to his wedding. However, I was not able to make it.

Just like the many examples we have done. Everything hinges on $c_1=c_2$, then it is easy to see that a) is the right answer since $c_1=c_2=138$.

3. Think of your problems as opportunities.

- a) If your trust fund promises to pay you \$25,000 on your 26 birthday (6 years from today) and earns 9% compounded annually, then what is the trust fund's present value?

A bit more than \$14,906

- b) What is the present value of a consol that pays \$1000 a year, and starts immediately, if the interest rate is 12%.

\$9,333

- c) What is the present value of a consol that pays \$1000 a year starting next year, if the interest rate is 12%

\$8,333

- d) What is approximately the maximum amount that a firm should consider paying for a project that will return \$12,000 annually for 6 years if the opportunity cost is 12%?

No more than \$49336.8

- e) If we know a project's IRR is 11%, and provides annual cash-flows of \$15,000 for six years, how much is the maximum that the project could

have cost assuming the investors are rational decision makers and what to maximize income?

Around \$63,458

4. Should I wait or should I not

- We have the chance of investing \$1000 today, and have immediate access to a new product that promises to revolutionize the way we use computers. That product can sell for \$500 today. Tomorrow (and forever after that) it can either go up to \$750, or if our competitor introduces a better product, the price will go down to \$250. The cost of producing the good is negligible once we make the investment.
- The Chief Financial Officer says the probability that the price will go up is 50%. He also tells us that the interest rate is 10%
- Would you invest today or next period? Justify your answer numerically.

**With an expected price of \$500, the NPV of investing today is \$4500
The NPV of waiting is less, \$4,091 (notice that even if the price goes down we will still do the investment next period since it gives a positive NPV with the price at \$250.**

- How much are you willing to pay for the flexibility of being able to choose between investing today or tomorrow, instead of having a now or never choice?

Actually in this case nothing, the investment is cheap enough that even in expectation is worth doing today.

- Can you find how high the initial investment has to be such that you would be indifferent between investing today or waiting until next period.

Given the information given there is no initial investment such that you would wait.

- What happens if our CFO was way off and the probability of the price going up is only 30%.

Here the Expected price is \$400, with this the NPV of investing today is \$3400, of waiting is a bit more than \$3000, the decision does not change.