

October Quiz

Final for 6-unit subject; Midterm for 12-unit subject

This is a “closed book” exam.

No books, notes, electronic aids or assistance from others allowed.

Please certify that you complete the quiz fairly by signing LEGIBLY:

Your name legibly: _____

Quiz points are distributed
roughly according to the minutes estimated for each question.

Item	Max. Points	Your Points
Your Name	1	
Definitions	16	
Evaluation	16	
Recognizing Uncertainty	23	
Value under Uncertainty	15	
Flexibility	16	
Better Information	13	
Extra Credit Simulation	8	
Total (without extra)	100	

Evaluation (16 points)

Kris Masala plans to develop a novel holiday gift under the “Kris Mas” brand. The idea is to make money to pay for Spring tuition. Kris needs your help in running the evaluation.

Kris tells you that the plan:

- Expects to sell 12,000 units over the end of year holidays
- At \$15 per unit,
- Which would be a 25% markup over the sum of production costs of \$4/unit for materials and \$8/unit for production and order fulfillment.
- Kris would organize this during an extended trip in June to meet suppliers and set up the supply-chain and to establish the production process with a capacity of 12,000 units – cost estimated at \$20,000.
- Kris would fund this set-up cost by charging her/his credit card for these initial expenses, noting that this carries an annual interest rate of 20%.

Kris is all excited about this plan “I’m going to net 36K. I’ll almost double my money in 6 months on an investment of only 20K – what a deal!”

To validate the project, you now:

- A. Set up a two-period spreadsheet for the Discounted Cash Flow, time $t=0$ being July 1, and time $t=1$ being 6 months later at the end of the year, December 31. (8 points)
- B. Recognize Kris’ Time Value of Money over the life of the project as – what? (3 points)
- C. Estimate the Project Net Present Value, based on the information supplied. (5 points)

Recognizing Uncertainty (23 points)

You've done what Kris requested but point out that sales of 12,000 units aren't assured. After discussion, you both agree that

- The most likely number of sales is 10,000 (probability 60%)
- But sales could easily be only 5,000 due to various problems in the supply chain during the holiday season (probability 30%)
- On the other hand, the product might become very popular with a demand for 50,000 units (probability 10%).

This recognition leads you to rethink the evaluation, so you now:

- A. Plot the histogram distribution of the possible demand (5 points)
- B. Calculate the Net Present Value associated with each of the possible demand levels, recognizing that the plan currently only allows for a maximum production of 12,000 units. (10 points)
- C. Plot the histogram of the possible outcomes derived from the calculation in part B, which you compare with the histogram in part A. (5 points)
- D. Kris doesn't understand the comparison between these two distributions when you show them. How do you explain what you observe? (3 points)

Value under Uncertainty (15 points)

Following on the discussion of the so far:

- A. You calculate the Expected Net Present Value for the project given its latest description. (8 points)
- B. Do you conclude then that the project is worthwhile? (4 points)
- C. How do you respond to Kris' remark that the project is chancy and might not get much return on all the effort. (3 points)

Flexibility (16 points)

Thinking about the previous discussion, Kris gets excited about the prospect of cashing in on the potential demand for 50,000. What could be done to take advantage of that demand if it should happen?

Kris hits upon this scheme to improve the “Kris Mas” project:

- To pay 3,000\$ in July to pay to bring best friend Tom to come visit for Thanksgiving at the end of November.
- Then, if then 50,000 demand has materialized, pay Tom 3,000\$ more in December to stay and work with Kris to ensure delivery of the whole big demand. If the 50,000 does not happen, Tom will go home without working on the project.

As this possibility has gotten complicated, you step in and:

- A. Draw the decision tree comparing the (8 points)
 - a. “Base Project”, the previous situation you calculated, with
 - b. “Flexible Project”, the one that brings Tom to town in case the project needs his help in delivering the possible 50,000 demand.
- B. Calculate which of the two plans delivers the higher Expected Net Present Value. (5 points)
- C. Tell Kris which decision you recommend based on current information. (3 points)

Better information (13 points)

As Kris is considering the latest development, you suggest that Kris might hire an expert on holiday markets, to get advice on whether the demand for 50,000 units would occur. The expert would cost 2,000\$, paid in July. Kris asks you to help figure this out.

You thus now:

- A. Structure the decision tree for the project that includes the choice of hiring the market consultant. (5 points)
- B. Proceed to Calculate the Expected Value of Perfect Information associated with this information about the demand for 50,000 units. (5 points)
- C. Given the results, do you advise Kris to pay the consultant's \$2,000 fee? (3 points)

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