

NOTES ON THE SECOND HOMEWORK ASSIGNMENT

1. The homework is due on Monday, October 13. Homework emailed or delivered after class on the due date may be marked down for being late.
2. Once again, I prefer you deliver your homework by email in pdf format. My second choice is by email in MS Word format. Finally, you may turn in a paper version if you desire. Email address: michael.giberson@ttu.edu.
3. For your reference, I've included a copy of the assignment sheet showing the values I used to prepare the sample analysis below. You do not need to return your assignment sheet.
4. You may use the blank MS Word 2007 document available on the website as a template or produce your own diagram that reflects the same organization of information.
5. Try to keep your report to a single page.
6. Feel free to copy the text of the report below as appropriate.
7. The assumed values for prices, costs, and discount factor vary from sheet to sheet; make sure your report reflects the valuation as based upon your project.
8. Be sure to include the appropriate project number in the report header so I can check your work against the right numbers.

ENCO 4312 – Energy Economics
Second Assignment

Valuation of a lease allowing for managerial flexibility – Project #HL2-TX

Harvey Llama Co. is back asking for your advice. He has been offered a lease on an undeveloped property known to have 1,000 mmcf in gas reserves. The lease contains an option to develop the resource within two years. If development has not begun within two years, the lease expires. If development begins in time, the lease contains an option to produce the developed reserve. The property owner is asking merely \$200,000 [*as a bonus payment*].

Harvey is considering acquiring the lease, developing the property, and selling the developed reserve. There is an active market for developed reserves with a current market price of \$6.00/mcf. Harvey estimates the costs of developing the property to be \$7.25/mcf, which would make immediate development of the property unprofitable (because total costs – fee to owner plus development costs – would be \$7,350,000 and the developed reserve would sell for only \$6,000,000).

Still, Harvey knows that gas prices can be volatile, and the value of developed gas reserves moves closely with the price of gas at the wellhead. He suspects that the lease may be worth acquiring now on the off chance that prices increase in the next year or two and make development of the field profitable. The problem is, he can't figure out how much the lease is worth.

The current market price for gas is \$9, and developed reserves in the area of the lease sell exactly \$3/mcf below the market price (hence the current market price for developed reserves of \$6.00/mcf). Each year there is a 50 percent chance that prices will increase by \$1/mcf and a 50 percent chance that prices will fall by \$1/mcf. Ignore inflation, and employ a discount factor of 20 percent.

Your task is to calculate the value of the lease and present the analysis in the memo format shown in the sample report (online at the class website).

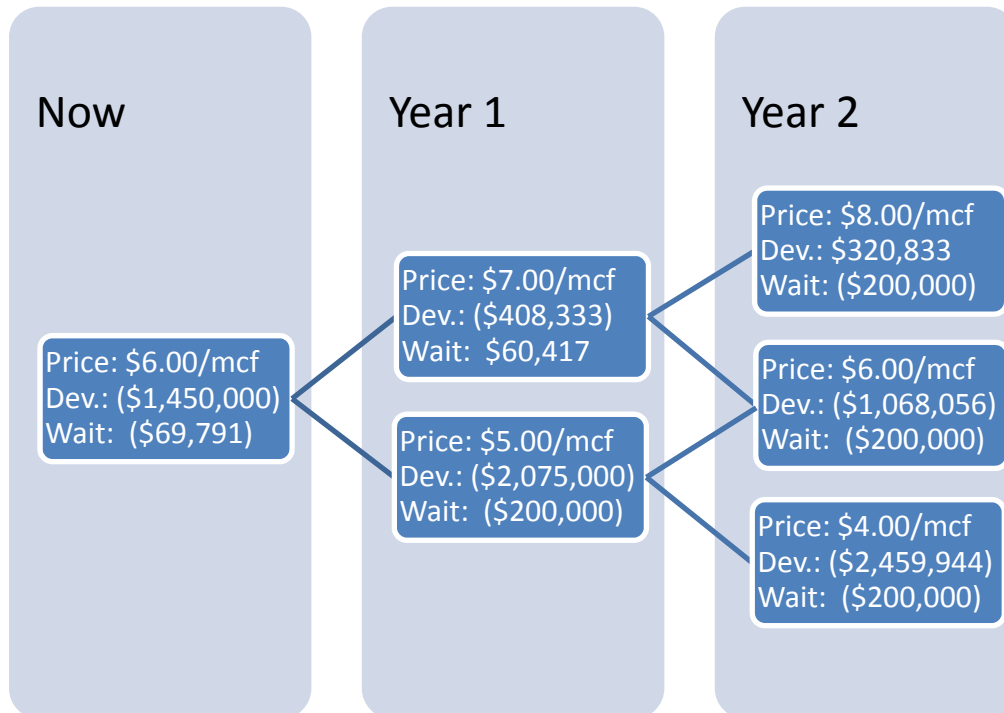
In addition, answer the following questions (as also shown in the sample report). According to your analysis, should Harvey acquire the lease? If Harvey should buy the lease, under what circumstances should he develop the property?

Re: Valuation of project #HL2-TX [← YOUR PROJECT # HERE]

From: [YOUR NAME GOES HERE]

Date: October 13, 2008 [← ASSIGNMENT DUE DATE]

Using the data and assumptions provided by the client Harvey Llama Co., the following valuation has been calculated.



Note: Amounts rounded to nearest dollar. (Negative values in parenthesis).

Net Present Value (NPV): Given the results shown above, the NPV of the option is \$-69,791.

Discussion: The net present value of the project is negative, indicating that the project is unlikely to be profitable to the Harvey Llama Co., and therefore I recommend against acquiring the project on the listed terms.

Note that the project as described is profitable only if developed and only if the price in Year 2 reaches \$8.00/mcf. However, the profits available in that case are not substantial enough to make the overall project likely to be profitable given present conditions.

The NPV of \$-69,791 tells us that if the bonus sought by the owner [*\$200,000 in this example*] was reduced by \$70,000 then the project would be expected to produce a small profit. Perhaps Mr. Llama can use this information in negotiations over the bonus payment.