

FIN 294 - Valuation of Energy Investments

(MW 3:00 – 5:00, Classroom GSB 5.142A, Unique #03155)

Instructor: Dr. Warren J. (Joe) Hahn

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Office Location & Hours: CBA 6.228, TTH 11:00 - 12:30 pm and by appointment

Description: This course covers the theory and practice of the evaluation and financing of energy investments with a focus on application to upstream oil and gas projects. This topic provides students with an opportunity to further develop their financial modeling skills, from detailed discounted cash flow models to advanced option pricing models utilizing a variety of computational approaches. The first half of the course will focus on valuation of projects in a deterministic setting, while the second half will involve stochastic models of project cash flows and managerial decision making (real options).

Key questions to be addressed include:

- What characteristics distinguish energy projects from other types of investments?
- How are the cash flows estimated for a typical energy project?
- What commodity price assumptions apply?
- How can project risks be quantified, and how do they affect the cost of capital?
- What real options are associated with different types of energy assets?
- What are the different approaches for valuing real options in an energy setting?
- How are energy investments rolled up in a firm's capital budgeting process?
- How is valuation information used in the acquisition and divestiture of energy assets?

Prerequisite

- BA 285T or BA 385T

Materials

- No required textbook (I will be providing course notes electronically)
- Supplemental reading (not required, but useful): Financial Models using Simulation and Optimization 1. http://www.palisade.com/books/financial_models.asp (paperback). Can buy bundled with Financial Models using Simulation and Optimization 2 (also useful) at a discount.
- @Risk (simulation add-in for Excel). Available in labs and for download (<http://www.mcombs.utexas.edu/Tech/Computer-Services/COE.aspx>)
- DPL (Installation instructions and key to be distributed via Canvas)

Course Requirements and Grading

- Class Participation: 10%
- Homework: 40%
- Exam 1: 20%
- Exam 2: 30%
- I expect to be compliant with the Department guideline for class GPA for MSF elective courses

Class participation will be graded based on your attendance and involvement in class. Except on days when we have speakers, laptops are permitted in class, and you are encouraged to work along with examples that are presented in class. However, you should not be using your laptop to surf the web, check e-mail, etc. during class. Based upon observations in past courses, active involvement in class is highly positively correlated with the course grade received.

Homework is a key determinant of success in this course. Instructions for submitting homework is as follows:

- Written analyses are to be prepared by groups of up to three. Students can form their own groups, but please see me if you need help. Groups should remain constant for all of the assignments, barring extraordinary circumstances.
- All homework is due by 3:00PM on the day given on the assignment. Each group will hand in only one assignment report.
- Each student is expected to be actively involved in the analysis and work submitted.
- Each group should work independently (i.e., none of the work submitted should be based on the analyses, results or other work done by another group).

Solutions to the homework will be reviewed in class on the day the assignment is due.

Homework grades will be communicated via Canvas and the grading rubrics that are applied will also be posted in Canvas. If you wish to appeal your grade on any assignment, you have 7 days from the time it was returned to the class (not when you receive it). All homework appeals must be e-mailed and addressed to me at joe.hahn@mcombs.utexas.edu.

Other Relevant Class Policies

- Since I review homework solutions in class on the day they are due, I cannot accept late submissions.
- I do not post solution files, since we review them in class. I want you to be involved in making any corrections necessary to your homework, due to the learning involved.
- Missing assignments will receive a grade of zero, and make-up work is generally not possible.
- Because I want to encourage students to complete all assignments, I do not drop any homework grades.
- Before the exams, I will overview the material to be covered and discuss how to prepare, but I do not provide practice exams.

- The exams are to be taken at the scheduled day/time. If you are unable to attend an exam due to an emergency, your absence must be cleared through Student Emergency Services at <http://deanofstudents.utexas.edu/emergency/>. A missed exam will receive a grade of zero.
- In no circumstance will I give an early exam.
- I keep all graded exams in my office but you can visit anytime to view your exam.

Academic Dishonesty

I have a zero tolerance policy for acts of academic dishonesty. Such acts damage the reputation of the school and the degree and demean the honest efforts of the majority of students. The minimum penalty for an act of academic dishonesty will be a zero for that assignment or exam, and I intend to turn any cases of academic dishonesty over to the disciplinary process of the school. As specific guidance for this course, you should consider the writing of all examinations to be an individual effort. Group preparation for examinations is acceptable and encouraged. Homework and case assignments should be done in your groups, and I encourage you to work together in answering the questions.

Students with Disabilities

Upon request, the University of Texas at Austin provides appropriate academic accommodations for qualified students with disabilities. Services for Students with Disabilities (SSD) is housed in the Office of the Dean of Students, located on the fourth floor of the Student Services Building. Information on how to register, downloadable forms, including guidelines for documentation, accommodation request letters, and releases of information are available online at <http://deanofstudents.utexas.edu/ssd/index.php>. Please do not hesitate to contact SSD at (512) 471-6259 or via e-mail if you have any questions. **If you will be utilizing an opportunity for extra time for an exam, you must notify the instructor at least 14 days prior to the exam so that appropriate accommodations can be scheduled.**

Religious Holidays

By University policy you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you miss the due date for an assignment due to your observance of a holy day you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Tentative Schedule

Class	Date	Topic	Readings	HW due
1	Mar 19	Course Introduction, Energy Industry Overview	DB pp. 9-31	
2	Mar 21	Estimating Reserves		
3	Mar 26	Estimating Reserves, Decline Curve Analysis	DB pp. 32-103	
4	Mar 28	Decline Curve Analysis		
5	Apr 2	Price Forecasting	DB pp. 129-156	HW1
6	Apr 4	Price Forecasting, Estimating Cash Flows		
7	Apr 9	Estimating Cash Flows, Review		HW2
8	Apr 11	Exam 1		
9	Apr 16	Project Risk Analysis	Suslick et al (2009)	
10	Apr 18	Real Options Associated with Energy Assets	Luehrman (1998)	
11	Apr 23	Valuing Real Options with Binomial Lattices		HW3
12	Apr 25	Valuing Real Options with Binomial Lattices	Copeland (2004)	
13	Apr 30	Valuing Real Options with Simulation	Winston (Ch. 42)	HW4
14	May 2	Exam 2		