FIN 372 - Advanced Topics in Finance
Valuation of Energy Investments
(MW 11:00 - 12:30, Classroom CBA 4.324, Unique #03490)

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Office Location & Hours: CBA 6.304F, TTH 10:00 - 11:30 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

- FIN 374C

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.mccombs.utexas.edu/Tech/Computer-Services/COE.aspx)
- DPL (Installation instructions and key to be distributed via Canvas)

Course Requirements and Grading

- Class Participation: 5%
- Homework: 35%
- Midterm Exam: 30%
- Final Exam: 30%
- I expect to be compliant with the Department guideline for class GPA for elective courses (approximately 3.4 GPA as a long-run average).

Class participation will be graded based on your attendance on days which we have class speakers. Since our speakers are graciously volunteering their time to come to our class, your attendance is mandatory on those days. I will generally announce scheduled speakers one week in advance, and you are allowed to miss one speaker during the semester. I do not track class participation or attendance during regular class days, but you are responsible for everything covered or assigned 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 11:00AM 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 be 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 10 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@mccombs.utexas.edu.

The midterm exam will be administered in class on March 9th. The final exam will cover material from the second half of the course, and will be administered on the last day of class (May 4th).

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.
- 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 grades.
- Before exams I will overview the material to be covered and discuss how to prepare, but I do not provide practice exams.
- I do not post exam solutions. We will review the midterm exam solution in class.
- Exams are to be taken at the scheduled day/time. If you are unable to attend the midterm or final 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.
- You are welcome to discuss your final grade with me - after the semester break.

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 (all dates but Midterm and Final are subject to change)

Class	Date	Topic	Readings	HW due
1	Jan 20	Course Introduction, Energy Industry Overview	DB pp. 9-31	
2	Jan 25	Valuation Methodologies, NAV Models		
3	Jan 27	Estimating Reserves	DB pp. 32-103	
4	Feb 1	Decline Curve Analysis		
5	Feb 3	Decline Curve Analysis	Notes (handout)	
6	Feb 8	Price Forecasting		
7	Feb 10	Price Forecasting	DB pp. 129-156	HW1
8	Feb 15	Estimating Cash Flows		
9	Feb 17	Cost of Energy Capital		
10	Feb 22	Project Risk Analysis	Suslick et al (2009)	HW2
11	Feb 24	Project Risk Analysis		
12	Feb 29	Financing Energy Investments		
13	Mar2	Financing Energy Investments		HW3
14	Mar 7	REVIEW		
15	**Mar 9**	**Midterm (time and location tbd)**		
	Mar 14	*No Class – Spring Break*		
	Mar 16	*No Class – Spring Break*		
16	Mar 21	Risk Neutral Valuation		
17	Mar 23	Valuing Flexibility	Luehrman (1998)	
18	Mar 28	Real Options Associated with Energy Assets		
19	Mar 30	Valuing Real Options with Binomial Lattices	DPL User Guide	
20	Apr 4	Valuing Real Options with Binomial Lattices		HW4
21	Apr 6	Valuing Real Options with Binomial Lattices		
22	Apr 11	Valuing Real Options with Simulation	Copeland (2004)	
23	Apr 13	Valuing Real Options with Simulation		HW5
24	Apr 18	Valuing Real Options with Simulation		
25	Apr 20	Capital Budgeting and Energy Project Portfolios		
26	Apr 25	Acquisitions and Divestitures of Energy Assets	Winston (Ch. 42)	HW6
27	Apr 27	Acquisitions and Divestitures of Energy Assets		
28	May 2	Review		
29	**May 4**	**Final**		