

Colorado School of Mines

EBGN 547 – Financial Risk Management, Spring 2005

T, R 9:30 – 10:45 a.m.

Professor: Irina Khindanova

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Office hours from February 1: Wednesday, 10:00 a.m. - 2:00 p.m.

Thursday, 4:00- 5:00

**Textbooks:**

- **Required:** Hull, J., *Options, Futures, and Other Derivatives*, 2006, 6<sup>th</sup> edition, Prentice Hall
- **Recommended:** Smithson, C.W., *Managing Financial Risk: A Guide to Derivative Products, Financial Engineering, and Value Maximization*, 1998, 3<sup>rd</sup> edition, McGraw-Hill\*

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**Readings:**

- **Required:**
  - Current issues of the Wall Street Journal, the Financial Times
  - See also Course Outline
- **Optional :**
  - Holliwell, J., *The Financial Risk Manual: A Systematic Guide to Identifying and Managing Financial Risk*, 1998, Pearson Education Ltd.\*
  - Mason S., R. Merton, A. Perold, and P. Tufano, *Cases in Financial Engineering: Applied Studies of Financial Innovation*, 1994, Prentice Hall\*

*Market Risk*

- Dowd, K., *Measuring Market Risk*, 2002, John Wiley & Sons.
- JP Morgan and Company, 1996, *RiskMetrics<sup>TM</sup> – Technical Document*, 4<sup>th</sup> edition.

*Credit risk*

- JP Morgan and Company, 1997, *CreditMetrics<sup>TM</sup> – Technical Document. The Benchmark for Understanding Credit Risk.*

*Energy Risk Management*

- Pilipovic, D., *Energy Risk: Valuing and Managing Energy Derivatives*, 1997, McGraw-Hill\*
- Fusaro P.C., *Energy Risk Management: Hedging Strategies and Instruments for the International Energy Markets*, 1998, McGraw-Hill

- Fusaro P.C., *Energy Convergence: the Beginning of the Multi-Commodity Market*, 2002, Wiley\*
- *Managing Energy Price Risk*, 1999, 2<sup>nd</sup> edition, edited by A. Eglinton, Risk Books
- *Energy Modelling and the Management of Uncertainty*, 1999, by FT Power UK, Risk Books

#### *Energy Trading*

- Wengler, J., *Managing Energy Risk: A Nontechnical Guide to Markets and Trading*, 2001, Pennwell Corp.\*
- Errera S. and S.L. Brown, *Fundamentals of Trading Energy Futures and Options*, 1999\*
- Sturm F.J., *Trading Natural Gas: Cash Futures, Options, and Swaps*, 1997\*

#### *Energy Hedging*

- *Crude Oil Hedging: Benchmarking Price Protection Strategies*, 1998, by Energy Security Analysis, Inc., Risk Books
- E.N. Krapels; ~~*Electricity Trading and Hedging, 2000, Risk Books*~~
- *Natural Gas Hedging: Benchmarking Price Protection Strategies*, 1999, by Energy Security Analysis, Inc., Risk Books

#### *Metals Risk Management*

- C. Mason, *Managing Metals Price Risk*, 1997, Risk Books

\* Available in the Arthur Lakes library

**Note:** Please read assigned readings and textbook chapters before lectures

#### **Grading:**

Homework problem sets	
(total #: 8)	8%
Case Studies (total #: 3)	21%
Midterm	26%
Quiz	10%
Final	35%

#### **Homework problem sets (HW):**

- see due dates in the course outline
- must be handed in at the beginning of a lecture
- evaluated on the 0-10 scale
- late submissions will be penalized 50%

#### **Case Studies**

- memoranda:
  - due on dates of the first discussion of cases, shown in the course outline

- must be turned in at the beginning of a lecture
- evaluated on the 0-10 scale
- late submissions will be penalized 50%
- in-class discussion. For each case, a number of students will present results of their analysis
- grading: (memoranda grade) + (class discussion grade)

You can work on HW and case studies in teams of up to 3 students.

**Final exam:** A paper on an analysis of risk management at a chosen company or any financial risk management topic. Due on the official date by the end of the scheduled time of the final exam.

**Exams schedule:**

Midterm:           , Tuesday, regular class time

Final:             May

- Midterm must be taken at the scheduled time. NO make-up exams will be given.
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**Course Outline – Version 1, 1/10/05**

Week	Date	Lecture #	<input type="checkbox"/> Lecture topics <input type="checkbox"/> Case Studies <input type="checkbox"/> Readings <ul style="list-style-type: none"> <li><input type="checkbox"/> Readings below are <u>in addition</u> to Lecture Notes</li> <li><input type="checkbox"/> [O] - Optional</li> </ul> <input type="checkbox"/> HW
			<b>Introduction to Financial Risk Management</b>
1	R 2.02	1	<i>Risk Management Process. Business Risk Analysis. Financial Risk Management</i> Readings: [O] Holliwell: S-n 1; S-n 3, pages 111 – 138
			<b>Building Blocks of Financial Risk Management</b>
2	T 2.07	2	<i>Forwards and Futures</i> Readings: (1) Hull: Ch. 1.3, 1.4; 2; 4; 5 HW #1 -- Hull: 2.3, 2.16, 2.23, 2.26, 2.29. Due on
	R 2.09	3	<i>Forwards and Futures (cont.)</i>
3	T	4	<i>Hedging Using Futures</i> Readings: (1) Hull: Ch. 3; 6 (2) Smithson: Ch. 5, 7 HW #2 -- Hull: 3.24, 3.25, 6.25, 6.26; Due on
	R	5	<i>Hedging Using Futures (cont.)</i>
4	T	6	<i>Swaps</i> Readings: (1) Hull: Ch. 7 HW #3 -- Hull: 7.3, 7.5, 7.20, 7.23; Due on
	R	7	<i>Swaps (cont.)</i>
5	T	8	<i>Hedging Using Swaps</i> Readings: (1) Smithson: Ch. 9
5	R	9	<i>Options</i> Readings: (1) Hull: Ch. 8, 9.1, 9.4, 13.8, 14.3 –14.5 HW #4 -- Hull: 9.25, 12.27, 13.29, 14.35; Due on
6	T	10	<i>Options (cont.)</i>
	R	11	<i>Hedging Using Options</i> Readings: (1) Smithson: Ch. 12 (2) Hull: Ch. 15 HW #5 -- Hull: 15.10, 15.11, 15.25; Due
7	T	12	<i>Hedging Using Options (cont.)</i>
		13	<i>Interest Rate Derivatives</i> Readings: (1) Hull: Ch. 26.3 (2) Smithson: p. 20-22

			HW #6 -- Hull: 26.1, 26.5, 26.17, 26.24
		14	<i>Interest Rate Derivatives (cont.)</i>
	R	15	<i>Rationale for Financial Risk Management</i> Readings: (1) Froot, Scharfstein, Stein, "Risk Management: Coordinating Corporate Investment and Financing" (2) Smithson, "Managing Risk in the Industrial Company" (3) Tufano, "Why Manage Risk?" (4) Tufano, "Who Manages Risk? An Empirical Examination of Risk Management Practices in The Gold Mining Industry"
			<b>Identifying, Measuring, Reporting, and Managing the Exposure to Market and Credit Risk</b>
		16	<i>Price Risk Management</i> Case Study: American Barrick Resource Corporation: Managing Gold Price Risk Readings: [O] Tufano, P., "The Determinants of Stock Price Exposure: Financial Engineering and the Gold Mining Industry" Value at Risk (VaR)
		17	<i>Price Risk Management (cont.)</i> Case Study: American Barrick Resource Corporation: Managing Gold Price Risk
8	T	18	<i>Value at Risk (VaR)</i> Readings: (1) Hull: Ch. 18 [O] Dowd, 1.3, 2.2 [O] Khindanova, Atakhanova, 2002, "Stable Modeling in Energy Risk Management" HW #7 -- Hull: 18.12, 18.17, 18.18; Due on
	R	19	<i>Value at Risk (VaR) (cont.)</i>
9	T	20	<i>Value at Risk (VaR) (cont.)</i>
	R	21	<i>Foreign Exchange Risk Management</i> Case Study: Aspen Technology, Inc.: Currency Hedging Review Readings: (1) Hull: Ch. 7.8, 14.4 (2) Smithson: p. 18-20
10	T	22	<i>Foreign Exchange Risk Management (cont.)</i> Case Study: Aspen Technology, Inc.: Currency Hedging Review
	R	23	<i>Credit Risk</i> Readings: (1) Hull: Ch. 20 (2) JP Morgan: Introduction to CreditMetrics HW #8 -- Hull: 20.1, 20.2, 20.26, 20.29. Due on

		24	<i>Credit Risk (cont.)</i>
11			<b>Spring Break</b>
12	T	25	<i>Energy Instruments. Swaps</i> Readings: [O] Eglinton: p. 17 – 36
	R	26	<i>Energy Instruments. Options</i> Readings: [O] Eglinton: p. 37 – 94
13	T	27	<i>Interest Rate Risk Management</i> Case Study: Union Carbide Corporation: Interest Rate Risk Management.
	R	28	<i>Interest Rate Risk Management (cont.)</i> Case Study: Union Carbide Corporation: Interest Rate Risk Management.
14	T		<b>Midterm</b>
			Quiz
17	T	29	Class presentations “Risk Management research paper”
	R	30	Class presentations “Risk Management research paper”
			<b>“Risk Management research paper” – in lieu of Final Exam</b>