

**INSR 210/835**  
**Financial Strategies and Analysis: Insurance**  
**Syllabus Fall 2010**

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Insurance and Risk Management Department

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**I. Course description**

The course presents the fundamentals of risk management. The strategic approach to risk management requires understanding of risk measures, insurance, financial and commodity derivatives, as well as alternative risk financing. The course focus is on the current practices and challenges of implementing risk management programs in financial and non-financial corporations. Case discussions are the core of the course, combined with development of tools necessary to measure and manage risks.

The course starts with the discussion of why risk management is important. It explains the conditions under which a corporate risk management strategy differs from the one obtained in Modigliani Miller ideal world. Under these conditions a corporation can enhance the shareholder value through risk management better than a pool of diversified investors. Next the course provides a thorough description of different risk measures with a focus on different estimation techniques of Value at Risk (VaR) models including GARCH. The course then explains measurement and management of market risks, cash flow risks for non-financial firms, interest rate risks, credit risks and operational risks. It discusses various techniques used to identify and measure a company's exposure to financial risks and develop the strategies that can be applied to manage these risks. However, the emphasis is on the process of risk management and financial engineering as opposed to the valuation of financial derivative products.

Students will learn how to measure both the costs and benefits of managing risks and therefore be able to identify sound financial risk management practices leading to increase in firm value. Some operational aspects (e.g. accounting, tax, managerial and regulatory considerations) which affect the risk management decisions of firms will also be discussed. Students will review some of the controversial cases like Orange County and Metallgesellschaft, that suffered large losses due to poor risk management decisions. Cases cover risk management problems for both financial intermediaries and non-financial firms.

After successfully completing the course, the students will be able to demonstrate ability to

- Describe and be able to identify the major classes of risks that business face
- Apply portfolio management and traditional corporate finance theory to risk management problems
- Identify, measure, evaluate and document the extent to which a corporation faces various financial risks using Value-at-Risk and other risk measures
- Model the economic risk exposure of the firm
- Understand how decisions regarding risk interact with other corporate decisions including capital structure, capital allocation, divisional performance and evaluation, project selection and compensation
- Price the tools used in financial risk management
- Understand how the traditional tools of risk management, including insurance, can be used to complement and/or enhance financial risk management tools

- Based upon review of a case, recommend a risk management strategy a firm could employ to create a strategic advantage over its competitors

## II. Method of Instruction

Case discussions are the core of the course. Student participation in case discussions is essential for the benefit of everyone. The students are expected to work in teams with 2-3 participants. In addition to cases, the course material will be presented through lectures, exercises, and guest lectures.

## III. Course Materials

### Required textbook

John C. Hull, *Risk Management and Financial Institutions*, Prentice-Hall Inc. 2009

### Additional texts, not required

John C. Hull, *Introduction to Futures and Option Markets*, Prentice-Hall Inc., various years  
 Rene Stulz, *Risk Management and Derivatives*, Thomson South- Western: Mason OH 2003

### Cases

HBS Cases are available at HBS Publishing website. The instructions will be sent by email.  
 Non-HBS cases will be posted on WebCafe.

### Journal articles

Readings for the class include academic journal articles. Articles will be posted on WebCafe.

### Software

Some cases require the estimation of GARCH and Value at Risk models. A set of programs has been developed to help students to focus on the economic interpretation of results rather than the estimation procedure. The programs are written in MatLab. Students have to obtain a student license to MatLab to use these materials. The basic instructions on these materials are available on WebCafe.

## IV. Grading

The grade is based on eight cases and one problem set (85%), and a final take home case (15%). The grade for the case is composed of two elements: the case write-up and the class discussion.

## V. Additional Information and Guidelines

- *Prerequisites:* Introductory Finance, Introductory Statistics, basic knowledge of Excel. Background knowledge of derivative pricing (futures, options, swaps) is beneficial for this class. Some material is necessarily analytical and quantitative, but the course does not require the knowledge of mathematics and statistics beyond what is required for the prerequisites.
- *Expectations:* All students must become familiar with and adhere to the Penn Code of Academic Integrity. Class attendance and punctuality are expected. Make-up exam is offered only under University-approved excuses. In case a student is unable to attend a class, written assignments must be hand in before the respective class.

## VI. Course outline

This is a tentative schedule; deviations may be necessary.

### Wednesday, September 8

#### 1. Risk management: The Known, the Unknown and the Unknowable

##### *Assigned Readings*

1. Ralph Gomory, The known, the unknown and the unknowable, *Scientific American*, 1995.
2. Deloitte, Global Risk Management Survey, 2009.

### Monday, September 13

#### 2. Why corporations manage risk? Does risk management add value?

##### *Assigned readings*

1. Stulz, Chapter 3
2. Rene Stulz, Rethinking Risk Management, *Journal of Applied Corporate Finance*, Fall 1996.
3. Smithson, Charles, and Betty Simkins, Does Risk Management Add Value? A Survey of the Evidence, *Journal of Applied Corporate Finance*, Summer 2005, 8-18.

### Wednesday, September 15

#### 3. Integrated risk management and value creation

##### **Case discussion: Hydro One**

##### *Assigned readings*

1. Brian W. Nocco and Rene Stulz, Enterprise Risk Management: Theory and Practice, *Journal of Applied Corporate Finance*, Fall 2006
2. John Fraser and Betty Simkins, Ten common misconceptions about enterprise risk management, *Journal of Applied Corporate Finance*, Fall 2007
3. Gates, Stephen, Incorporating Strategic Risk into Enterprise Risk Management, *Journal of Applied Corporate Finance*, Fall 2006.

### Monday, September 20

#### 4. Integrating ERM analysis into corporate credit ratings

##### **Invited Speaker: Steven Dreyer, Lead Analytical Manager, Standard and Poor's**

##### *Assigned readings*

1. Steven Dreyer, Progress Report: Integrating enterprise risk management analysis into corporate credit ratings, Standard and Poor's July 2009.
2. Steven Dreyer, S&P looks further into how nonfinancial companies manage risk, Standard and Poor's June 2010.

**Wednesday, September 22**

**5. When a company should hedge?**

**Case discussion: Risk Management at Apache**

*Assigned readings*

1. Rene Stulz, Should we fear derivatives? *Journal of Economic Perspectives*, Summer 2004.

**Monday, September 27**

**6. Managing risk with and without derivatives**

**Case discussion: American Barrick**

*Assigned readings*

1. Petersen, Mitchell A. and S. Ramu Thiagarajan, Risk Management and Hedging: With and Without Derivatives, *Financial Management*, Winter 2000.

**Wednesday, September 29**

**7. Measuring risk. Introduction to Value at Risk Models. Cash Flow at Risk.**

*Assigned readings*

1. Hull, Chapter 8
2. Stultz, Chapter 4

**Monday, October 4**

**8. Estimation of VaR: Historical and Monte Carlo approaches, accounting for fat tails.**

*Assigned readings*

1. Hull, Chapter 10
2. Ronald Huisman, Kees Koedijk and Rachel Pownall, VaR-x: Fat tails in financial risk management, *Journal of Risk*, vol. 1 1998.

**Wednesday, October 6**

**9. Volatility Models: EWMA, ARCH and GARCH**

**Problem Set is DUE**

*Assigned readings*

1. Hull, Chapter 9

**Wednesday, October 13**

**10. Beyond VaR: liquidity risks and stress tests. VaR in practice**

**Case Discussion: Estimating VaR for S&P 500 portfolio**

*Assigned readings*

1. Basel Committee on Global Financial System, A Survey of Stress Tests and Current Practice at Major Financial Institutions, April 2001.

### **Monday, October 18**

#### **11. Measuring Risk for Non-Financial Companies. Cash Flow at Risk**

##### *Assigned readings*

1. Jeremy C. Stein and Stephen E. Usher, A comparables approach to measuring cash flow – at – risk for non-financial companies, *Journal of Applied Corporate Finance*, Winter 2001.
2. Niclas Andren, Hakan Jankensgard, Lars Oxelheim, Exposure-based Cash flow – at – risk: An alternative to VaR for industrial companies, *Journal of Applied Corporate Finance*, Summer 2005.
3. Paul D. Kaplan and James D. Peterson, Full-information industry betas, *Financial Management*, Summer 1998.

### **Wednesday, October 20**

#### **12. Hedging with forward, futures and options contracts**

##### *Assigned readings*

1. Hull, Chapter 5
2. Hull, Chapter 6

### **Monday, October 25**

#### **13. Case discussion: Metallgesellschaft**

##### *Assigned reading*

Christopher L. Culp, Merton H. Miller, Metallgesellschaft and the economics of synthetic storage, *Journal of Applied Corporate Finance*, Winter 1995.

Antonio S. Mello and John E. Parsons, Maturity structure of a hedge matters: lessons from the Metallgesellschaft debacle, *Journal of Applied Corporate Finance*, Spring 1995.

Franklin R. Edwards, Michael S. Canter, The collapse of Metallgesellschaft: unhedgeable risks, poor hedging, or just bad luck?, *Journal of Futures Markets*, 1995.

**Wednesday, October 27**

**14. Case discussion: Southwest Airlines**

*Assigned readings*

David Carter, Daniel Rogers, Betty Simkins, Does fuel hedging make economic sense. The case of the US airline industry, working paper, OSU 2004.

Energy derivatives and the transformation of the US corporate energy sector, *Journal of Applied Corporate Finance*, 13(4): 50-75, 2001.

**Monday, November 1**

**15. Interest rate risk. Options on bonds and interest rates. Interest rate swaps**

*Assigned readings*

1. Hull, Chapter 7

**Wednesday, November 3**

**16. Case discussion: Orange County**

**Monday, November 8**

**17. Modeling and managing cash flow exposures. How to choose between different hedging instruments?**

*Assigned readings*

1. Gregory W. Brown and Klaus Bjerre Toft, How firms should hedge?, *Review of Financial Studies*, Autumn 2002

**Wednesday, November 10**

**18. Modeling and managing cash flow exposures. What are the trade-offs firms face in practice?**

*Assigned readings*

1. Gregory W. Brown, Managing foreign exchange risk with derivatives, *Journal of Financial Economics*, vol. 6, 2001

**Monday, November 15**

**19. Credit risk. Default and credit migration. Portfolio models of credit risk**

*Assigned readings*

1. Hull, Chapter 14

**Wednesday, November 17**

**20. Credit risk VaR and capital calculation**

*Assigned readings*

1. Hull, Chapter 15

**Monday, November 22**

**21. Operational risk management. Operational risk process models**

*Assigned readings*

1. Hull, Chapter 18

**Wednesday, November 24 Thanksgiving NO CLASS**

**Monday, November 29**

**22. Operational value at risk**

*Assigned readings*

1. Hull, Chapter 18

**Wednesday, December 1**

**23. Capital allocation and Risk-Adjusted Performance**

*Assigned readings*

PRMH Section III.0

Robert C. Merton and Andre F. Perold, Theory of Risk Capital in Financial Firms, *Journal of Applied Corporate Finance*, 1993.

Kenneth Froot and Jeremy Stein, A New Approach to Capital Budgeting for Financial Institutions, *Journal of Applied Corporate Finance*, Summer 1998.

Prakash Shimpi, Integrating Risk Management and Capital Management, *Journal of Applied Corporate Finance*, Winter 2002.

**Monday, December 6**

**24. Capital budgeting and contingent capital**

**Case discussion: Cephalon**

**Wednesday, December 8**

**25. Concluding Comments and Distribution of the take-home exam.**