

# Financial Risk Management

Course: Financial Risk Management	Term: Fall 2009
Professor: Bahattin Buyuksahin	e-mail: bbuyuks1@jhu.edu
Course Number and Location: BU.756.715, DC Campus Room:208	Phone: (202) 4360202
Meeting time: Th 7:45 – 9:45, Aug 27 –Dec 10	Office Hour: by appointment only

## COURSE OBJECTIVES

### Course Description

The course offers an introduction into the evolving and expanding practice of financial risk management. Risk management is a complex process of identifying, measuring, and controlling risk exposure. The course addresses how to control for market and credit risks. Liquidity, operational, and legal risks are discussed. Topics include value at risk, Monte Carlo simulation, scenario analysis, stress testing, credit value at risk, and credit derivatives.

### Course Overview

The course offers an introduction into the evolving and expanding practice of financial risk management. Risk management is a complex process of identifying, quantifying and managing various risk exposures. The course analyzes and discusses the various sources of risk. Particular attention is devoted to the main risk management techniques such as Value at Risk (VaR), volatility models, and correlation models.

The course focuses on the main issues of financial risk management.

Risk management has emerged as one of the most important area in finance. The evolution of this subject has been attracting the interest of both practitioners and academia. Therefore, the course is a blend of theory and application. Real data analysis is an important part of this course. A student successfully completing this course will be familiar with the main current practices of financial risk management.

There are three main sources of risk: market risk, credit risk and operational risk.

The course is divided into three parts.

- a) The first part analyzes market risk: Risk to a financial portfolio from movements in market prices such as equity prices, FX, interest rates and commodity prices;
- b) The second part concentrates on credit risk: It consists of risk of default (complete or partial);
- c) Finally, the third part deals with operational risk: Risk of loss due to physical catastrophe, technical failure, human error including fraud, failure of management and process error.

### Learning Outcomes

Students attending this class will learn

- i) how to measure market risk;
- ii) how to hedge market risk;
- iii) how to model, risk, volatility and correlations;
- iv) the main techniques of Value at Risk (VaR);
- v) how to measure and manage credit risk.

Although the course will cover market, credit and operational risk, the main focus is on the first two sources of risk. Stochastic processes and Monte Carlo techniques are also a very important part of the course

### Prerequisites

This is a technical course and requires a good understanding of calculus, probability and statistics. A good review of these topics is offered in the required and recommended textbook. Students are required to read the following chapters from the first required book:

- 1) Chapter 2: Fundamentals of Probability
- 2) Chapter 3: Fundamentals of Statistics
- 3) Chapter 4: Monte Carlo Methods.

Students are also required to be familiar with derivatives and in particular with futures, forwards and options. In fact, the courses Derivative Securities (course number 756.761) and Investment Analysis and Portfolio Management (course number 756.760) are prerequisites.

Students are required to read the following chapters from the first required book:

- 1) Chapter 5: Introduction to Derivatives
- 2) Chapter 6: Options
- 3) Chapter 7: Fixed Income Securities
- 4) Chapter 8: Fixed Income Derivatives
- 5) Chapter 9: Equity, Currency, and Commodity Markets

### Homework and Exams

Discussion and exams will reward those who prepare in advance. The exams will draw heavily on the homework assignments given throughout the semester. Grading will be based on homework (30 percent), a midterm exam (35 percent) and a cumulative final exam (35 percent). Exams are taken without the aid of textbooks or of notes of any kind. All homework should be typed and submitted to me by e-mail not later than specified due date (homework sent in late will not be accepted). For programming assignments, you should submit a working program file. For analytic and algebraic exercises, I prefer to receive them as a LaTeX format but also accept PDF files.

We will use the Eviews programming language in this course. Although Eviews is not available on campus, there is a student version Eviews that you can use at home. You will need to download it.

This class uses Blackboard web-based system. Most class documents will be uploaded to this site. Students should have an account on Blackboard to access the class web-site and to obtain class handouts. To get an account, go to Blackboard login page, <http://bb.carey.jhu.edu> and follow the instructions.

### Required Texts

We will use only parts of the following text.

- Philippe Jorion (2008), **Financial Risk Manager Handbook**, Fifth Edition, GARP, Wiley Finance (hereafter, PJ).
- John Hull (2008), **Options, Futures and Other Derivatives**, 7<sup>th</sup> Edition, Prentice Hall (hereafter, JH).

## Recommended Texts

- Peter Christoffersen (2003), **Elements of Financial Risk Management**, Academic Press (hereafter, PC).
- Robert McDonald (2006), **Derivatives Markets**, 2<sup>nd</sup> Edition, Addison Wesley. (hereafter, RM).
- Jonathan Mun (2006) , **Modeling Risk: Applying Monte Carlo Simulation, Real Options Analysis, Forecasting, and Optimization Techniques**, 1<sup>st</sup> Edition, Wiley. (hereafter JM)
- John Marthinsen (2009), **Risk Takers: Uses and Abuses of Financial Derivatives**, 2<sup>nd</sup> Edition, Pearson Education. (hereafter JMA)

## Topics and Readings

Exams will not presume knowledge of the optional articles, except to the extent that they have been explicitly discussed in class. New articles may be added to the list during the course. The following is a tentative outline. Circumstances may arise which result in more or less material being covered.

### Week 1 and 2

#### Introduction to Financial Risk Management

Req. JMA ch.1-9

Rec.

### Week 3

#### Market Risk Management: Measurement: VaR and Monte Carlo Simulation

Req. PJ Ch.10; ch. 4

Rec. JH Ch 20

### Week 4

#### Market Risk Management Sources of Market Risk

Req. PJ Ch. 11;

Rec.

### Week 5

#### Market Risk Management Hedging Linear Risk and Nonlinear Risk

Req. PJ Ch.12 and 13;

Rec.

### Week 6

Market Risk Management  
Modeling Risk Factors VaR Methods

Req. PJ. Ch 14 and 15;  
Rec.

Week 7  
Market Risk Management  
Volatility and Correlation Models

Req. JH ch 21  
Rec.

Week 8  
Credit Risk Management  
Introduction to Credit Risk

Req. PJ. Ch 18  
Rec.

Week 9  
Take-Home Midterm Exam  
Guest Speaker: Tentatively Jeffrey Harris, CFTC Chief Economist

Week 10  
Credit Risk Management  
Measuring Credit Risk

Req. PJ. Ch 19 and 20; JH ch 22  
Rec.

Week 11  
Credit Risk Management  
Credit Exposure and Managing Credit Risk

Req. PJ. Ch 21 and 23  
Rec.

Week 12  
Credit Risk Management  
Credit Derivatives

Req. PJ Ch. 22 and JH ch 23  
Rec.

Week 13

Operational Risk Management  
Operational Risk and Risk Capital

Req. PJ Ch 24 and 25

Rec.

Week 14  
Operational Risk Management

Req. PJ Ch. 29 and 30

Rec.

*Attendance Policy*

Attendance and participation are part of your course grade. Full attendance and active participation are required for you to succeed in this course. Two classes, both excused and unexcused, may be missed without penalty. Beyond those two absences, your participation grade will be dropped ten points for each absence. Six absences, whether excused or not, result in a failing grade for the course. For an absence to be excused, you must have contacted the instructor prior to the class meeting, and you must provide a valid, legitimate, substantiated excuse at the next class session.

*Academic Integrity and Ethical Conduct*

**Carey Business School students assume an obligation to conduct themselves in a manner appropriate to The Johns Hopkins University's mission as an institution of higher education and with accepted standards of ethical and professional conduct. Students must demonstrate personal integrity and honesty at all times in completing classroom assignments and examinations, in carrying out their fieldwork or other applied learning activities, and in their interactions with others. Students are obligated to refrain from acts they know or, under the circumstances, have reason to know will impair their integrity or the integrity of the university. Violations of academic integrity and ethical conduct include but are not limited to cheating, plagiarism, unapproved multiple submissions, knowingly furnishing false or incomplete information to any agent of the university for inclusion in academic records, violation of the rights of human and animal subjects in research, and falsification, forgery, alteration, destruction, or misuse of official university documents or seal. Students are also expected to abide by the Student Code of Conduct (see pages 40-42).**

<http://carey.jhu.edu/catalog/academic-policies/academic-standards/>

### *Disability Services*

If you are a student with a documented disability who requires an academic adjustment, auxiliary aid, or other accommodations, please contact Jennifer Smith in the Disability Services office at least **four weeks** prior to the beginning of the first class meeting:

- Phone: 410/516-9728;
- Fax: 410/516-9748; or
- E-mail: [onestop.disability@jhu.edu](mailto:onestop.disability@jhu.edu)

### *Statement of Diversity and Inclusion*

Johns Hopkins University is a community committed to sharing values of diversity and inclusion in order to achieve and sustain excellence. We believe excellence is best promoted by being a diverse group of students, faculty and staff who are committed to creating a climate of mutual respect that is supportive of one another's success.

### *Testing Center*

The Testing Center provides testing-related services including:

- Administration of make-up exams
- Accommodation for special testing needs due to a documented disability through Disability Services
- Referrals for tutoring

Contact the center by phone at 410/516-9750 or email: [onestop.testing@jhu.edu](mailto:onestop.testing@jhu.edu) to inquire about testing needs.