

University of Oklahoma
Michael F. Price College of Business

Financial Risk Management FIN 4513 – 001

Fall 2012

Tuesday, Thursday 3:00 – 4:15 pm PH 2040

Office Hours: Tuesday, Thursday 1:00-3:00 pm

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“With a clear understanding of the risks they face, business can maximize their performance and drive toward their competitive advantage.”

“Effective risk management ... separates those who are educated, careful risk takers, from those who are simply gamblers.”

- Lord Levene, Chairman of Lloyd’s

Course Overview

The Financial Risk Management course focuses on defining, measuring, and managing risk in financial institutions as well as non-financial corporations, including, in particular, oil and gas companies. The course introduces you to different types of risk, including market (such as price and interest rate) risk, credit (such as default) risk, liquidity risk, operational risk, and – in the special case of oil and gas project financing – legal, political and environmental risk. The course covers several major techniques of risk management such as portfolio diversification, asset-liability management (ALM), static and dynamic hedging with derivatives (options, futures, and swaps), estimating default probabilities, calculating Value-at Risk, stress testing, scenario analysis, and risk allocation. The course also covers regulation of risk management activities in financial institutions and touches upon some of the reasons of the financial crisis of 2007-2008.

Why take this course?

- Risk Management is an absolutely essential component in the overall financial management expertise. One cannot claim to be an expert in finance without any background in risk management.
- Risk management is an integral part of decision-making in financial institutions and non-financial corporations, including firms that hire OU graduates. Risk management techniques are used by a variety of professionals such as corporate planners, financial analysts, insurance policy writers and others.
- Having Risk Management on your resume is certain to impress employers and to give you a competitive edge in the job search process: first, it demonstrates that you are a truly motivated individual who embraces challenge and new learning opportunities; and second, it gives you a unique set of skills not common for an average finance major.
- The recent financial crisis has emphasized the importance of careful and skillful risk management for financial and non-financial companies alike. Graduates with university-level training in risk management have a clear edge in today’s times.

Format

Most of the course will be based on *lectures*. You will also have a chance to get *hands-on experience* in measuring risk using real-life data through homework assignments. You will *practice* such essential risk measurement tools as portfolio diversification, calculating Value-at-Risk, dynamic hedging with call options, and estimating default probabilities from yield spreads. You will also interact with *guest speakers* from the industry who will share real-life risk management cases and answer your questions.

Difficulty

Most parts of the course (about 70%) are quantitative and involve extensive application of quantitative models such as the Black-Scholes option pricing model. You will also extensively use Microsoft Excel (including Solver). Other parts of the course (about 30%) are mostly qualitative and involve minimal computations but require a lot of memorization of definitions and legal and regulatory details.

Help

I will provide you with lots of help along the way. We shall do a step-by-step “rehearsal” of each homework assignment in class, which means we shall do *exercises identical to the homework* assignments before you receive the actual assignment. I shall place *handouts*, which will have a form of Microsoft Excel worksheets, guiding you step-by-step through each assignment: you will simply have to replicate them except with different input data! We shall do *plenty of numerical exercises* in class to prepare you for quizzes and tests. You may bring a *formula sheet* to all quizzes and tests.

Prerequisites You must have completed Finance 4103 to receive a grade for this class.

Special Accommodations: Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact the instructor personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities. The University of Oklahoma is committed to providing reasonable accommodations for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with me as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The office of Disability Services is located in Goddard Health Center, Suit 166, phone (405) 325-3852 or TDD only (405) 325-4173.

Religious Holidays It is the policy of the University to excuse absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required class work that may fall on religious holidays.

Academic Integrity The University policy on academic integrity will be strictly followed. The information about the policy on academic misconduct is located on the following website: <http://www.ou.edu/provost/integrity>

Attendance I will check your attendance and take **10 points off** your course grade for each class missed without a legitimate excuse (such as a doctor's note). Attendance in this class is absolutely essential: you will NOT be able to learn the course material without attending class.

Required Textbook The textbook for this course is the packet consisting of selected chapters from *Risk Management and Financial Institutions*, second edition by John C. Hull. Your reading assignment sheet attached to this syllabus states which sections of book chapters and which handouts you should read before each class. Your **class notes** will be the most important reading and will tell you which parts of each chapter to focus on.

Optional (excellent) book "Risk Management" by Croughey, Galai and Mark, ISBN 0-07-135731-9

Grades The course grade will be determined based on the following:

Two homework projects (100 pts each)	200 points
Five Quizzes (40 pts each)	200 points
Midterm	300 points
Final (Not Comprehensive)	300 points
TOTAL	1000 points

Letter Grades A = 90% or above; B=80-89%; C=70-79%; D=60-69%; F=<60%. No curve shall apply.

Quizzes A total of six quizzes shall be given. A quiz missed for an unexcused reason will receive a zero. There will be no make-up quizzes. A quiz missed for a valid reason (a note is required) will not affect your grade. The quiz with the lowest score (except a zero received for non-excused absence) will be dropped.

Make-up Exams An exam missed for a valid reason may be made up within one week. You will need to make arrangements with me regarding the time / location. If you miss the final exam and cannot make it up before the course grades are due you will receive an "I" (for Incomplete), pending your taking the final exam.

Homework Assignments are due midnight (the very end of day) on the due date. **Late assignments shall not receive any credit.** Submit via Drop Box on D2L. Turn in all assignments in Excel. Answer the "text" questions in the same file please.

Communication Please check your university email account regularly. The best way to reach me is via email also.

Graduate Assistant My graduate assistant will assist in grading homework and quizzes. Please address your questions concerning these grades directly to the GA. Let me know if there is a dispute.

Class Schedule and Reading Assignments
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Class Topic	Readings (packet) Handouts (on http://learn.ou.edu)
Aug 21-23 Introduction	No Assignment
Aug 28- Sep 6 Regulation of Risk Management	Chapter 6 Handout 1
Sep 11-27 Value at Risk	Chapters 3, 7, 8, 12 Handouts 2, 3
Oct 2-4 Interest Rate Risk; Asset-Liability Management, Duration and Convexity	Chapter 2
Oct 9 Review for Midterm	
Oct 11 MIDTERM	
Oct 16 - 25 Credit Risk: Introduction	Chapter 9
Oct 30 Financial Crisis	Chapter 11
Nov 1 – Nov 20 Price Risk; The Greeks; Hedging with Futures And Options; Dynamic Hedging	Chapter 1 Handouts 4a, b
Nov 22 THANKSGIVING	
Nov 27 Energy Hedging Exercise	No Assignment
Nov 29 Risk in Oil and Gas Project Financing	No Assignment
Dec 4 Liquidity and Model Risk	Chapter 14
Dec 6 Review for Final Exam	

Fall 2012 FIN 4513 -001 Homework Assignment Sheet

Assignment 1: due Oct 9 midnight

Use the example on D2L as your guide in completing the assignment. Please do not use another format – it delays grading.

Go to <http://finance.yahoo.com> and download the daily adjusted close stock prices for LIZ, MSFT, WMT, and XOM for the period 1/9/2007 through 7/17/2009. You will have 636 daily prices. (Please make sure all dates download correctly. Sometimes Yahoo will not download one or more of the observations.)

- I Use the daily prices to calculate daily returns for each of the stocks. Calculate returns as log price ratios, that is, $R_t = \ln(P_t / P_{t-1})$. You will have 635 daily returns for each stock.
- II Build a histogram for one of the stock's returns (stock of your choice). Is this distribution well approximated by a normal distribution?
- III For each of the stocks, find the average daily return and daily variance of returns using the functions AVERAGE and VAR in Microsoft Excel.
- IV Calculate the Variance-Covariance Matrix of the four stocks using functions VAR and COVAR in Microsoft Excel.
- V Consider the following portfolio of the four stocks with dollar positions specified as follows:

	LIZ	MSFT	WMT	XOM	PORTFOLIO
Shares	?	?	?	?	
Close Price	?	?	?	?	
Value of Position	\$18,340.00	\$18,338.00	\$17,382.00	\$7,912.00	
Portfolio Value					\$61,972.00
Weights	?	?	?	?	

Notice that this is the exact same portfolio (by dollar values) that we held in our class exercise! Except we considered data for 1999, and this time things are going to be different!

Fill out the missing lines in the table above: the portfolio weights, the close prices on the last

day of your sample period, and the number of shares of each stock you hold in the portfolio.

- VI Calculate the mean return and the variance of the portfolio.
- VII Using your answer in VI, calculate expected value of the portfolio.
- VIII Calculate the daily 99% VaR(1,99) for the portfolio assuming normal return distribution.
- IX Find the sum of VaR(1,99) of the four individual positions. Compare it to your answer for portfolio VaR in part VIII. How much smaller is the portfolio VaR? Why do we observe this reduction?
- X Compare the portfolio VaR to the portfolio VaR we obtained in class for the same portfolio in 1999. Has risk increased or decreased since 1999?

Assignment 2: due Dec 6 midnight

Use the example on D2L to complete this assignment.

For this assignment, you need to locate stock and call option prices and T-bill quotes in the Wall Street Journal daily over a period of one week (five consecutive business days). Use the stock and the option of your choice but the **option should be close to at the money!** (The option must be on that same stock, of course.) Make sure that the maturities of the T-bill and the option are different by no more than one day!

If you have online access: go to <http://online.wsj.com/documents/mktindex.htm> (that is the web link to Markets Data Center of the Wall Street Journal online). Once on the Markets Data Center page, look for stock and option quotations under “US Stocks”, and for Treasury quotes under “Bond Markets.”

For a stock (and option) of your choice, design a synthetic call option identical to the option you have chosen. After that, maintain a dynamic hedge for a period of one week, recording your trades in a table daily. Please use the format provided in the Handout.

IMPORTANT DATES:

Quiz 1 Aug 30
Quiz 2 Sep 13
Quiz 3 Sep 27
Quiz 4 Oct 25
Quiz 5 Nov 8
Quiz 6 Nov 29

HWK 1 Oct 9
HWK 2 Dec 6