Master of Finance Program

“Credit Risk” Course Syllabus

2017

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Course Description and Learning Objectives
Credit derivatives are the biggest financial innovations in the last 20 years. Credit risk analysis and management are of great interest to investment banks, commercial banks, traders, regulators, and rating agencies. This course provides an introduction as well as an in-depth understanding of credit risk measurement and credit derivatives. The objective is to provide a practice-oriented balance between developing a sound conceptual framework and market understanding and insight. This course will help students understand the causes and consequences of the credit crisis originated in subprime mortgage default and CDO write-downs in 2007 as well as the ongoing credit issues in Asia/China:

1. To learn the principles of the valuation of investment opportunities.
2. To learn how investment portfolios can optimally be constructed.
3. To be fluent in handling data with Spreadsheets etc.
4. To be able to apply the principles of no-arbitrage, and the techniques of valuation and hedging, to financial derivatives and related instruments.
5. To be familiar with the financial products in the market, and their uses.
6. To understand the issues surrounding the pricing and risk management of products on the market.

Course Learning Outcomes
Upon completion of “Credit Risk”, students should be able to (1) know the basic features of credit instruments; (2) understand the role of credit rating in the economy; (3) describe the stylized facts of default and recovery; (4) grasp the frontier of credit derivative market developments; (5) evaluate the risk and return of credit investments.

Alignment of Program and Course Learning Outcomes

<table>
<thead>
<tr>
<th>Program Learning Outcomes</th>
<th>Course Learning Outcomes</th>
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<tbody>
<tr>
<td>To master current theory and knowledge in the field of economics</td>
<td>CLO1, CLO2, CLO3, CLO4, CLO5</td>
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<tr>
<td>To master the skills to deal with economic data</td>
<td>CLO1, CLO2, CLO3, CLO4, CLO5</td>
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<tr>
<td>To develop the ability to apply economics to real world problems</td>
<td>CLO1, CLO2, CLO3, CLO4, CLO5</td>
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<tr>
<td>To develop global and regional outlook and astuteness</td>
<td>CLO1, CLO2, CLO3, CLO4, CLO5</td>
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</table>
**Prerequisites**

2. Derivative Securities; and
3. Fixed Income Securities & Interest Rate Modelling

**Materials**

The area of credit risk management is under rapid development. I do not find any single textbook that can fit the need of the entire course. The *minimum* requirement at the completion of this course is a good understanding of the content of the following book:


There are also excellent advanced reference books written by leading researchers in this area:


This course will not teach programming skills, even though programming in either VBA or C++ is important to a successful career in credit analysis. The following books provide detailed hands on programming examples in credit risk modeling:

- SAS, 2014, Developing Credit risk Models Using SAS Enterprise Miner and SAS/STAT: Theory and Applications

Other background reading and reference books are listed below:

- The Codes of Finance
- Money Gods: The All Power FED and How It Moves the World
• David Graeber, 2011, Debt: The First 5,000 Years
• Lewis, Michael, 2010, The Big Short
• Zuckerman, Gregory, 2010, The Greatest Trade Ever
• Geisst, Charles, 2009, Collateral Damaged: The Marketing of Consumer Debt to America
• Cohon, William D, 2009, House of Cards: A Tale of Hubris and Wretched Excess on Wall Street
• Dominic O’Kane and Lutz Schoegl, 2001, Modelling Credit: Theory and Practice, Lehman Brothers International (Europe).
• Lehman Brothers and Risk Waters Group, 2003, The Lehman Brothers Guide to Exotic Credit Derivatives.
• Credit Suisse First Boston, 2004, Credit Portfolio Modeling Handbook.
• Blaise Ganguin and John Bilardello, 2005, Fundamentals of Corporate Credit Analysis, Standard & Poor’s.
• Arnaud de Servigny and Olivier Renault, 2004, Measuring and Managing Credit Risk, Standard & Poors

The following are useful and fun tea-time readings:

• Nassim Nicholas Taleb, 2007, The Black Swan: The Impact of the Highly Improbable
• Peter L. Bernstein, 2008, Capital Ideas Evolving
• Brett Jiu, 2007, Starting Your Career as a Wall Street Quant: A Practical, No-BS Guide to Getting a Job in Quantitative Finance and Launching a Lucrative Career (Paperback)
• Timothy Falcon Crack, 2003, Heard on The Street: Quantitative Questions from Wall Street Job Interviews
• Roger Lowenstein, 2001, When Genius Failed: Rise and Fall of Long-Term Capital Management
• Edwin Lefeuvre, Reminiscences of a Stock Operator
• Michael Lewis, Liar's Poker: Rising Through the Wreckage on Wall Street
• Burton G. Malkiel, A Random Walk Down Wall Street
• Jeremy J. Siegel, Stocks for the Long Run
• Peter L. Bernstein, Against the Gods: The Remarkable Story of Risk
Reading business news every day is a must if you want to succeed in the investment industry. Staying abreast of current events makes the course more interesting and will increase the retention of information which you will find useful in your career. I strongly recommend reading *The Financial Times, Wall Street Journal, The Economist, Business Week, Hong Kong Economic Journal* (信报), and *21st Century Business Herald* (21世纪经济报道) for Chinese news articles. Find your favorite financial websites (mine are www.cnbc.com and www.marketwatch.com) and check it out regularly. A useful website is www.wilmott.com. Research webpages of major investment banks, credit rating agencies, and credit service providers also contain useful materials.

Lecture notes and other relevant course materials will be distributed in class or electronically.

**Topics Covered**

1. *Stylized facts* on default, recovery, and rating
2. *Credit risk modeling* through firm value or hazard rate
3. *Credit derivatives* such as CDS and CDO
4. *Credit risk management* and regulatory compliance with Basel III
5. *Credit Crisis 2007-2009* in depth analysis and discussion; European Sovereign Crisis 2010-2012
6. *Asia/China* related credit issues such as *Dim Sum Bond; Consumer Credit*
7. *Incentives of market players* including credit rating agencies, investment banks, and regulators

**Course Evaluation**

Do not first worry about your grade, concern your efforts with learning the material. In the long run you will find that the knowledge you gained far outweighs in importance the grades you received. The course grade will be determined as follows:

- **Participation:** I strongly encourage and expect active participation from all students. Participation has the following components: (1) Involvement in class discussions (both quality and quantity); (2) Student feedbacks. I will record participation myself. Total participation counts 10%. *Attending less than 70% of the lectures is an automatic F* according to regulation.

- **Quizzes:** Two closed-book tests will be given during class time. The first one will be a 30-minute test, counting 10%. The second one will be a 45-minute test, counting 20%. Part of the second test will be based on content in test #1. Test questions are *straightforward*, including True or False, Multiple Choices, Short Answer, and simple Math Problems. (*Test Policy:* Alternative quiz dates cannot be given. Any conflict must be brought to my attention in writing by the end of the second week.)

- **Group Project:** You are required to form groups (of about 2-3 students) and do a project on credit analysis of listed companies (assign credit ratings to all firms). Each group needs to (1) make a 12-minute presentation during the last class; (2) submit one report by **June 25**. Good presentation and writing skills are important for a successful career. The presentation counts 10% and report counts 20%.

- **Group Negotiation Game:** Students in groups will act as equityholders, junior creditors (bondholders), and senior creditors (banks), and facilitator to perform a negotiation game in class. The assignment counts 20% (10% for discussion and 10% for report).

- **Individual Homework:** Each student will need to compile historical default data in Asia/Greater China area and analyze the credit risk of one public firm and one private firm. Details will be discussed in class. The assignment counts 10%.
Grading Grid:  
95-100: A+; 90-94.9: A; 85-89.9: A-;  
80-84.9: B+; 75-79.9: B; 70-74.9: B-;  
65-69.9: C+; 60-64.9: C; 55-59.9: C-;  
50-54.9: D; 0-49.9: F

<table>
<thead>
<tr>
<th>Course Learning Outcomes</th>
<th>Assessment Modes</th>
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<tbody>
<tr>
<td>CLO1</td>
<td>Homework, Test, Project</td>
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<tr>
<td>CLO2</td>
<td>Homework, Test, Project</td>
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<tr>
<td>CLO3</td>
<td>Homework, Test, Project</td>
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<tr>
<td>CLO4</td>
<td>Homework, Test, Project</td>
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<tr>
<td>CLO5</td>
<td>Homework, Test, Project</td>
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**Study Guide**
Critical thinking is the key to long-term intellectual growth. You need to understand what you are studying, whether it be conceptual or analytical. When you study, ask yourself such question as:

- What is the purpose of this concept or formula?
- Why is it important?
- How to demonstrate its importance?
- How does it “fit” with what you have studied so far? either in this class or in an earlier class.
- How to say it in my own words?

**Student Feedbacks**
I am here to facilitate your learning. I want to answer your questions. I would like to know how things are going from the students' side. Quality feedbacks will have high tangible and intangible value (for the course and your learning as well as your grade).

“It's not what we don't know that prevents us from succeeding, it's what we know that just ain't so that is our greatest obstacle.” --- Josh Billings

**My Teaching Philosophy**
My goal as an educator is to help students find their interests, realize their potentials, and develop their critical thinking ability. I take responsibilities when students do not understand the materials. I respect my students and treat them fairly. I encourage team work and motivate independent thinking. The financial world is complex, but I strive to explain complex ideas simply and accurately. I only teach materials useful for students’ career and life.

**Academic Integrity**
Every HKU student is responsible for upholding the provisions of the University’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to University materials, misrepresentation/falsification of University records or academic work, malicious removal, or destruction of materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the University Judiciary Program, which includes either an informal resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement.
Course Policies

1. Any student with a disability should contact the office and instructor to discuss the resources available to them. Please contact the office for other administrative assistance.

2. Course evaluation rules are strictly followed. Make-up or unsolicited extra work to improve your grade is not possible. The final grade in the course, once assigned, will not be changed except in the event of a recording error.

3. I take cheating in any form very seriously. Any individual suspected of cheating, including copying homework solutions, stealing or using stolen examinations, will be disciplined to the maximum extent allowed by the University. **Signature forgery is a criminal offense!**

4. If you miss a class, it is entirely your responsibility to determine what you have missed including any administrative announcements I may have made.

5. Dignify yourself and respect your classmates and the instructor. Should you have to leave class early, please notify the lecture before class, leave quietly so as not to disturb the other members of the class.
## Tentative Class Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Date</th>
<th>Topic</th>
<th>Due</th>
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<tbody>
<tr>
<td>1</td>
<td>5/9</td>
<td>Introduction (Hong Kong Disney Case)</td>
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<td>Species of Credit: Bank Loan, Syndicated Loan, Bonds, Hybrids</td>
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<td>2</td>
<td>5/11</td>
<td>Financial Contracting: Credit Agreement and Renegotiation</td>
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<td>Debt Restructuring (Marvel Case)</td>
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<tr>
<td>3</td>
<td>5/16</td>
<td>Credit Risk Measure: Credit Rating</td>
<td>Group for Project</td>
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<td>China Credit Ratings</td>
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<tr>
<td>4</td>
<td>5/18</td>
<td>Credit Risk Measure: Z-score and other Scoring (CreditEase)</td>
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<td></td>
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<td>Credit Risk Measure: Reduced-form Approach</td>
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<tr>
<td>5</td>
<td>5/23</td>
<td>Credit Risk Measure: Merton Structural Models</td>
<td>Project Launch</td>
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<td>Moody's KMV EDF</td>
<td>3-min Talk</td>
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<td>6</td>
<td>5/25</td>
<td>Recovery Rate/Loss Given Default (LGD)</td>
<td>Negotiation Game</td>
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<td>Distressed Investment</td>
<td>Quiz #1</td>
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<td>7</td>
<td>5/27, 9:30</td>
<td>Credit Derivatives: Intro and New Developments</td>
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<td>Total Return Swaps; Credit Linked Notes (Mini Bonds)</td>
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<td></td>
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<td>(make-up) Total Return Swaps; Credit Linked Notes (Mini Bonds)</td>
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<td>8</td>
<td>6/01</td>
<td>Credit Default Swaps (CDS): International and China</td>
<td>Negotiation Report</td>
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<td>CDS Pricing and Capital Structure Arbitrage</td>
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<td>9</td>
<td>6/06</td>
<td>Securitization; CDO/CLO; Default Correlation</td>
<td>Project Update</td>
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<td>China Practices</td>
<td>5-min Talk</td>
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<tr>
<td>10</td>
<td>6/08</td>
<td>Bank Regulation; Basel III; Macro Prudential</td>
<td>Homework</td>
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<td>MPA in China</td>
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<td>11</td>
<td>6/13</td>
<td>Sovereign Risk (Mongolia, Argentina, Greece)</td>
<td>Quiz #2</td>
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<td>Local Government Debt (China, Puerto Rico)</td>
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<tr>
<td>12</td>
<td>6/15</td>
<td>SME/Consumer Credit, P2P, FinTech and Looking Forward</td>
<td>Project Presentation</td>
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</tbody>
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This schedule is subject to change at the instructor’s discretion.

I plan to invite guest speakers from industry to class.
One approach is case analysis: Moody’s Fine by SFC, HK Disney, London Whale, Argentina, Huishan, Kaisa
We will cover China credit markets (40-50% of the course content).