MATH 6590 SECTION 351, SPRING 2015, SYLLABUS
TOPICS ON CREDIT RISK

FACULTY: WEIPING LI
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1. Basic Course Information

Prerequisites: Math Math 4153, STAT 4203 (Basic Calculus I and Basic Probability).

Textbooks: *Credit Risk Modeling*, by David Lando, 2004, Princeton University Press and

   Credit Risk Pricing Models: Theory and Practice (Springer Finance), by Bernd Schmid, Springer.

Content: It is an intermediate course to learning credit risk modeling from theory to practice. The basic credit risk models comes from Merton's structural model, reduced-form model, statistical model, fundamental analysis and hybrids.

   Part I: Credit Risk Process, Credit Crisis

   Part II. Credit Risk Models

   Part III. Credit Ratings

   Part IV. Credit Derivatives

   Part V. Credit Risk Management

Teaching Notes and Dropbox: Available on a Dropbox folder a few days before the class. Dropbox shared folder for this course will be sent to your email. D2L will be another place to post any materials.

Class Time: TTR 10:30am–11:45am, start from January 13, 2015.

Class Room: MSCS 428.

Office Hours: TTR 3:30pm-4:15pm. Open door policy. In case you need to have a long meeting, please contact me to set a mutually convenient time first. No TA for this course, please be patient for the homework and exam returns.

2. Exams, Homework and Grade

Your grades will be determined by the scores on your projects and participations.

A as above 90 percent;

B as above 80 percent and less than 89 percent;

C as above 70 percent and less than 79 percent;

D as above 60 percent and less than 69 percent;

F as less than 59 percent.

FINAL EXAM: Tuesday May 5, 2015, 10:00am–11:50am at MSCS 428.

Each homework Assignment will be picked from textbooks and will be announced in **D2L**. If you cannot hand in homework on time or cannot make exam, the homework/exam you miss will be counted a zero. **No Make-up exam**. **No Late Homework**. Earlier homework is acceptable.

Syllabus Attachment:

http://academicaffairs.okstate.edu/faculty?a?staff

Academic Calendar http://registrar.okstate.edu/Academic-Calendar

3. Office and Policies

3.1. **Main Office.** Main office of Math Department 401 MS, phone number: 405–744–5688. Fax number: $405 - 744 - 8275$.

Classroom and Email

Class attendance is essential to your success in the course. You are responsible for all the material covered in the class.

No cellphone ring or call during the class time in the classroom.

All your emails will be answered to everyone in the class unless you specify the No Reply (This is to avoid the asymmetry information for other students).

3.2. **Missed Work Policy.** MATHEMATICS DEPARTMENT MODEL POLICY ON MISSED WORK

(A) A student shall be offered reasonable accommodation in the event that he or she misses a major assessment activity for a valid and documented reason.

(B) Appropriate documentation shall be provided by the student in a timely fashion to support his or her request for accommodation.

(C) Major assessment activities are those such that a zero on that activity could reasonably be foreseen to impact the students grade substantially; this category includes, but is not limited to, exams.

(D) Valid reasons include official University activities, activities associated with military service, illness, family emergencies, mandatory court appearances, and any other events of comparable gravity.

(E) Reasonable accommodation means that the student will be given the opportunity to earn a grade on the assessment activity that is based on criteria as similar as possible to those used to grade his or her classmates. This opportunity should normally be made available in a timely fashion.

4. Project

Everyone in the class will be assigned to a project. The project report is expected to finish **before April 24, 2014** (the week before Pre-Final Week).

4.1. Requirements for the Project. The project report must be written clearly on

(1) identifying the problem(s),

(2) presenting the background and history on the problem(s),

(3) identifying the method(s) used before and in the article,

(4) the new (innovation) contributions and goal(s) as well as the new findings in the article, and

(5) the main contribution(s) and summary of the article you choose.

4.2. Choose one of the articles below for your Project (group 2 or 3 persons).

(1) Chinese Sovereign debt default probability
(2) Empirical analysis on estimated default probabitliy
(3) Comparing S&P, Moody's and Fitch rating process
(4) Analyzing banking sector credit risk default, recovery rate and default correlations
(5) Stressing Test under Basel III or Dodd-Frank act
(6) Credit spread Puzzle
(7) Evaluate the pricing of CDO and CDS
(8) Liquidity and credit risk (related to debt pricing, risk premium, CDS and CDO)

5. Articles related to the course

5.1. Structural Models of Credit Risk: Theory.

(1) Merton (1974)
(2) Black and Cox (1976)
(3) Geske (1977)
(4) Cooper (1977)
(5) Cooper and Mello (1991)
(6) Shimko, Tejima and Van Deventer (1993)
(7) Zhou (1996)
(8) Longstaff and Schwartz (1995)
(9) Hsu, Saa-Requajo and Santa-Clara (2010)
(10) Kim, Ramaswamy and Sundaresan (1993)
(11) Collin-Dufresne and Goldstein (2001)

5.2. Structrual Models with empirical implementations.

(1) Jones, Mason and Rosenfeld (1984)

(2) Young Ho Eom, Jean Helwege, and Jingzhi Huang, "Structural Models of Corporate Bond Pricing: An Empirical Analysis,", Review of Financial Studies, 2004, 17, 499-544.
(3) Jean Helwege, Jingzhi Huang and Yuan Wang, "Liquidity Effects in Corporate Bond Spreads", Journal of Banking and Finance, 2014, 45, 105-116.
(4) How Much of the Corporate-Treasury Yield Spread Is Due to Credit Risk? Jing-Zhi Huang and Ming Huang, Rev Asset Pric Stud (2012) 2 (2): 153-202.
(5) Ericsson and Reneby (2004, 2005)
(6) Ericsson, Reneby and Wang (2006)
(7) Gemill (2002)
(8) Bharath and Shumway (2006)
(9) Shumway (2001)

5.3. **Reduced-form models of credit risk.**

5.4. **CDS, Bond spreads and liquidity.**

(1) Longstaff, Mitthal and Neis (2004)
(2) Blanco, Brennan and Marsh (2004)
(3) Zhang (2001)
(4) Acharya and Pedersen (2005)
(5) Chacko, mahanti and Mallick and Subrahmanyam (2006)
(6) de Jong and Driessen (2005)
(7) Ericsson, Reneby and Oviedo (2005)
(8) Nashkkar and Subrahmanyam (2006)

5.5. **Recovery Rates.**

5.6. **Credit Risk and Equity Returns.**

5.7. **Liquidity and its role in credit markets.**

5.8. **Structural models on corporate finance extensions.**

5.9. **Default correlations and systemic risk.** Department of Mathematics, Oklahoma State University Stillwater, Oklahoma 74078-0613

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