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**Course Number:** Bank Risk Management and Stress-Testing  
**Semester:** Spring, 2011/2012  
**Instructors:** Sophocles D. Voyazas  
**Credits:** 4 credit hours / 8 ECTS  
**Contact hours:** 60 hours  
**Learning hours:** 140 hours  
**Class Hours:** Mon-Fri, 17-21 (14-18 May 2012)  
**Meeting hours:** Upon agreement  
**Prerequisite:** There are no required prerequisites for this module. However, a general understanding of financial services industry and an ability to use basic MS Excel functionality would certainly help a successful attendance.

**Recommended Textbook:**

1. Saunders, A. and Cornett, M. (2008) *Financial Institutions Management: A Risk Management Approach*. 6th international ed. McGraw-Hill.

**Recommended Articles:**

2. Kritzman, M. (1992) What practitioners need to know about duration and convexity. *Financial Analyst Journal*, 48(6).
3. Altman, E., Haldeman, R. and Narayanan, P. (1977) ZETA Analysis: A New Model to Identify Bankruptcy Risk of Corporations. *Journal of Banking and Finance*, 1(1).
4. Wilson, T. (1998) Portfolio Credit Risk, *FRBNY Economic Policy Review*.
5. Cihak, M. (2004) Stress Testing: A Review of Key Concepts. *CNB, Internal Research Policy Note*, 2.
6. Boss, M. (2002) A Macroeconomic Credit Risk Model for Stress Testing the Austrian Credit Portfolio. *OeNB, Financial Stability Report*, 4.
7. Hoggarth, G., Sorensen, S. and Zicchino, L. (2005) Stress tests of UK banks using a VAR approach, *Bank of England Working Paper*, 282.

**Additional reading:**

1. Hull, J. C. (2009) *Risk Management and Financial Institutions*. 2<sup>th</sup> ed. Pearson.
2. Bessis, J. (2009) *Risk Management in Banking*. 3<sup>rd</sup> ed. Wiley.
3. Crouhy, M., Galai, D., and Mark, R., (2006) *The Essentials of Risk Management*. McGraw-Hill.
4. Rose, P.S. and Hudgins, S.C. (2010) *Bank Management and Financial Services*. 8<sup>th</sup> ed. McGraw-Hill.
5. Holton, G. (2004) Defining risk. *Financial Analysts Journal*, 60(6).
6. Santomero, A. (1995) Financial Risk Management: The Whys and Hows. *Journal of Financial Markets*, Institutions and Investments, 4.
7. Johannes, J. (1992) Beyond Textbook Asset-Liability Management. *Journal of Retail Banking*.
8. Lopez, J.A. (2008) What is liquidity risk? *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco, 33.
9. Diamond, D. and Dybyig, P. (1983) Bank runs, deposit insurance and Liquidity. *Journal of Political Economy*, 91.
10. Blaschke W., Jones M., Majnoni G. and Peria S. M. 2001. Stress Testing of Financial Systems: an Overview of Issues, Methodologies, and FSAP Experiences. *IMF Working Paper*, 188.
11. Sorge, M. (2004) Stress-testing Financial Systems: an Overview of Current Methodologies. *BIS Working Paper*, 165.

### **Course description:**

A major lesson of the global financial turmoil is the imperative need for sound and comprehensive risk governance and bank regulation. There is a rising need in the financial industry for experts who can analyse the market and have an integrated view of risk control and value creation. In this regard, this module gives a broad overview of bank risk management. Students will benefit from the inclusive, non-technical approach, and feel comfortable learning within an environment close to that of a professional workshop.

Broadly, the module is divided in three parts. The first part provides an introduction into banks and banking and the theoretical framework for addressing issues such as why banks are special and why they should be regulated. The second part introduces the specific risks of banks and how these risks can be quantified, measured and managed. In detail, it considers all aspects of risk management but focuses on interest rate, liquidity, market and credit risk. The third part will introduce the students to the foremost tools and techniques used in banks' and regulatory bodies risk management. The state-of-the art modelling in stress-testing will be discussed and demonstrated in the computer labs.

This course is directed toward students interested in understanding how risks can be quantified, architected and managed. We identify the business and technical issues, regulatory requirements and techniques to measure and report risks across a major banking institution.

### **Learning objectives:**

- Obtain a broad introduction to the topic of bank risk management
- Acquire a basic knowledge of the various aspects of bank risk management
- Understand the different dimensions of risk and its impact in banking
- Understand the measurement and management of the various types of risks in banking (credit, market, liquidity, interest rate, off-balance sheet, operational, legal, regulatory and reputation risks)
- Expand your understanding of the broader context behind analytical models and approaches to risk in banking

On successful completion of this module, students should:

LO1. Understand why risk is inherent to a bank's business model and therefore why effective risk management is critical

LO2. Understand the risk factors of the bank and the banking system.

LO3. Develop a critical awareness of risks within banking institutions

LO4. Integrate theoretical knowledge in real-life applications

LO5. Discuss the theory and practice of risk management within banking institutions, covering all main risk categories.

LO6. Become familiar with the relevant academic and empirical literature

LO7. Enhance critical thinking, writing and research skills

### **Course delivery:**

Lectures will cover the main concepts and issues the course readings (textbook & articles). They will be delivered in the form of PowerPoint presentations and (where applicable) exercises. Case-studies will be discussed and demonstrated to enable students understand the material taught. The presentations and articles will be provided to students prior to each lecture. It is expected that you have read the reading material for the lecture in advance.

### **Instructor's expectations from students:**

- Students are invited to actively participate in the classroom through questions and discussions.
- This would be an intensive, rigorous but also an interesting and worthwhile learning experience. For their own benefit, students are expected to have read the related studying material prior to delivery of each lecture.
- Think critically on the issues presented in the classroom.
- Avoid anti-social behavior in College and anti-academic behavior in the classroom (i.e. plagiarism, cheating, distraction etc.)
- Impose a self – discipline regarding Colleges rules and procedures.

### **Examinations structure:**

- *Exams:* final-term exam will include questions on the theory taught and critical thinking questions. One of the questions may require a comprehensive problem solution. Total 40%.
- *Coursework:* (a) a substantial essay (4.000 words) that combines equally literature review with critical thinking. Total 40%.
- *Class attendance and participation:* Active participation may upgrade your overall performance. Absence from classes and/or non-participation will be considered as a negative aspect and may deteriorate a student's final grade. Total 10%.

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### **14.05.2012 Introduction to bank risk management**

#### **The basics**

- Review of the banking theories (why banks exist, what their main activities are, banks' role in the real economy and the financial system)
- Overview of commercial and investment banking activities
- Introduction to risk management and types of risk
- The rationale behind stricter bank regulation and supervision

#### **Studying material:**

##### **Basic Reading**

Saunders, A. and Cornett, M.: Chapters 1 & 7  
Hull, J. C.: Chapter 1

##### **Non-basic Reading**

Santomero, A. (1997) A Commercial Bank Risk Management: an Analysis of the Process. *Wharton Financial Institutions Center Conference on Risk Management in Banking*.  
Stulz, R. (1996) Rethinking risk management. *Journal of Applied Corporate Finance*, 9.

#### **Discussion:**

**Global financial crisis of 2008 and past banking crises. What went wrong?**

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### **15.05.2012 The traditional and ever changing landscape of ALM. Managing interest rate risk**

- The bank balance sheet
- Components of assets/liabilities and their management
- The asset liability management process and the role of ALCO
- Managing interest rate risk (Gap methodology, Duration analysis)

#### **Studying material**

##### **Basic Reading**

Saunders, A. and Cornett, M.: Chapters 8 & 9  
Hull, J. C.: Chapter 4  
Rose, P.S. and Hudgins, S.C.: Chapters 5, 6 & 7  
Kritzman, M. (1992) What practitioners need to know about duration and convexity. *Financial Analyst Journal*, 48(6).

##### **Non-basic Reading**

Basel Committee on Banking Supervision (2001) *Principles for the Management and Supervision of Interest Rate Risk*, Bank for International Settlements.

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### **16.05.2012 Liquidity Risk**

- Defining liquidity risk
- Concepts of liquidity and solvency
- Principles for liquidity risk management – measuring bank's liquidity
- Historic liquidity problems & lessons learned from the global financial crisis in liquidity risk management.

#### **Market risk**

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- Defining market risk
  - Types of market risk
  - The VaR framework for market risk assessment and control (Key concepts, The basic VaR calculation, Limitations)
  - Nassib Taleb and Black Swans

**Studying material:**

**Basic Reading**

Saunders, A. and Cornett, M.: Chapters 10, 17, 18 & 20

Hull, J. C.: Chapters 8, 9, 10 & 15

Rose, P.S. and Hudgins, S.C.: Chapter 11

**Non-basic Reading**

Brunnermeier, M. (2009) Deciphering the liquidity crisis. *Journal of Economic Perspectives*, 23.

Berkowitz, J. and O'Brien, J. (2002) How accurate are Value-at-Risk models at commercial banks? *Journal of Finance*, 57.

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17.06.2009

**Credit risk**

- Importance of credit risk and relation to other risks
- Categories of credit risk
- Credit mitigation techniques
- Credit portfolio management techniques (credit derivatives, securitisation)
- Credit risk management tools and capital treatment of credit risk under Basel II & III.

**Studying material:**

**Basic Reading**

Saunders, A. and Cornett, M.: Chapters 11, 12 & 13

Hull, J. C.: Chapters 11 & 12

Rose, P.S. and Hudgins, S.C.: Chapter 16 & 17

Altman, E., Resti, A. and Sironi, A. (2006) Default Recovery Rates: A Review of the Literature and Recent Empirical Evidence. *Journal of Finance Literature*.

**Non-basic Reading**

Godlewski, C. J. (2005) Bank capital and credit risk taking in emerging market economies. *Journal of Banking Regulation*, 6(2).

Pana, E. (2010) Commercial real estate lending concentrations: New evidence. *North American Journal of Finance and Banking Research*, 4(4).

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18.06.2009

**Stress-testing**

- Introduction to stress testing (definition, types of stress-testing)
- Merton & Wilson . A review of the credit risk models
- Fundamentals of credit risk capital measurement (probability of default, exposure, loss given default and correlation)
- Macroeconomic credit risk modelling (a review of the literature & demonstration of the process in the computer labs)

**Studying material:**

**Basic Reading**

Saunders, A. and Cornett, M.: Chapters 12 & 20

Hull, J. C.: Chapters 8, 11, & 18

Wilson, T. (1998) Portfolio Credit Risk, *FRBNY Economic Policy Review*.

Cihak, M. (2004) Stress Testing: A Review of Key Concepts. *CNB, Internal Research Policy Note*, 2.

Boss, M. (2002) A Macroeconomic Credit Risk Model for Stress Testing the Austrian Credit Portfolio. *OeNB, Financial Stability Report*, 4.

Hoggarth, G., Sorensen, S. and Zicchino, L. (2005) Stress tests of UK banks using a VAR approach, *Bank of England Working Paper*, 282.

**Non-basic Reading**

Elliott, D. J. (2009) Bank Capital and the Stress Tests, *Initiative on Business and Public Policy, The Brookings Institution*.

### CPC Coverage in terms of hours

- 1) Functional area
  - A Marketing – 0 hour
  - B Business finance – 1 hours
  - C Accounting – 0 hours
  - D Management – 0 hours
- 2) The Business environment
  - A) Legal environment of Business – 0 hours
  - B) Economics – 10 hours
  - C) Business ethics – 1 hour
  - D) Global dimensions of Business – 1 hours
- 3) Technical skills
  - A) MIS/IT computing – 0 hour
  - B) Statistics/Quantitative techniques – 6 hours
- 4) Integrative areas
  - A) Business policy – 6 hours
  - B) Internship – 0 hours

### Assessment:

*Active participation and attendance-10%, Coursework-40%, Final Exams-40%..*

**Exams are closed books.** You can use your own calculator but nothing else will be allowed.

**Mobile phones are strictly not tolerated in the class for any use (including computations).** Active participation reflects a student's effort and the interest in the class/module.

After each session students are advised to study the relevant material and go through the exercises (where applicable). Students should be prepared for the next session by studying the articles, identifying the difficult points and posing their questions in the classroom.

Cheating and plagiarism in any form will result immediately in the grade F. In case a student misses the Final exam (or cannot deliver the Coursework on time) due to a **College-excused absence**, should contact be well in advance and certainly before final grades are due to the Record's Office. There will be no exceptions concerning the above policy.

### Grading Criteria

Grading points	%	Quality
A	96-100	4.00
A-	90-95	3.67
B+	87-89	3.33
B	83-86	3.00
B-	80-82	2.67
C+	77-79	2.33
C	73-76	2.00
C-	70-72	1.67
D+	67-69	1.33
D	63-66	1.00
D-	60-62	0.67

**Class Conduct:** Students hold responsibility for all issues announced, presented or discussed in the classroom. To avoid any misunderstanding, please do attend the classes and be punctual. The class starts promptly at the scheduled time. Late arrivals can cost.

For your own benefit, please refrain from talking during the lectures. If you have a question related to the module or you need further clarifications on something, please do not hesitate to interrupt me. There is no silly or naïve question. I do not accept criticism by other students towards the one asking a question. Most of the time, a question raised concerns more students than the one asking.

Remember that **while in classroom the language is only English.**

Class participation and an active intellectual engagement are not only expected but required. With the exception of the first lecture, there are no discussion topics in the following lectures. The discussion topics will be agreed between us and students should be prepared to deliver their presentations on a pre-agreed discussion topic. As a final examination students will complete a comprehensive written test. The written test will discuss the material covered mainly in the course readings. Do not rely solely on the textbook.

### **Keep in mind the following:**

C- or better is required to use a course either as a prerequisite or as a major requirement.

G.P.A. (Grade Point Average): is computed for each student using the quality points earned for each course taken. A G.P.A of at least 2.0 is required for transfer and to graduate from ACS.

I wish you an interesting and creative academic semester.

### **Academic Honesty**

The American College Skopje has its personal integrity which is presumed to be sufficient assurance in academic matters one's work is performed honestly and without unauthorized assistance. Undergraduate students, by registration, acknowledge the jurisdiction of the Honour System.

Plagiarism and cheating are serious offences and may be punished by failure on the exam, paper or project; failure in the course; and/or expulsion from the faculty. Individuals are prohibited from selling or being paid for taking notes in any form (written, electronic, or otherwise) during this course to or by any person or commercial firm without the express written permission of the professor teaching this course.

### **Late Work:**

Many reasons are given for late work (e.g., flat tires, printer problems, illness, oversleeping, etc.). No matter what the reason, the bottom line is that either (a) the work was completed and turned in when required or (b) the assignment was not completed and turned in when required.

As specified earlier, assignments are due in class at the beginning of class on the specified due date. There is NO PROVISION for late work on any assignment (i.e., late work is not accepted). I also strongly recommend to have backup systems in place so that you can have all work completed on schedule. Having your work completed on schedule is a key to early success in your business career.

NOTE: Late submissions are not accepted. Partial credit will NOT be given for late work.

**Approved by: Marjan Petreski**

**Date: December 2011**