Course description

Risk-taking and risk management are at the heart of the financial system, and of the current financial crisis. This course is an introduction to risk management, both from an individual financial firm’s viewpoint and in the context of the financial system.

The course surveys the basic quantitative tools used in market, credit and liquidity risk management, including detailed introductions to a standard model of market risk, Value-at-Risk, and a standard model of portfolio credit risk, the single-factor model. It also presents an overview of the contemporary financial system, focusing on innovations of the past few decades that have changed how financial risk is generated and distributed among market participants. Examples include the growth of non-bank financial intermediaries, the increased prevalence of leverage and liquidity risk, and the development of derivatives and structured credit products. The course also surveys the role of the the public sector—central banks and regulatory bodies—in the financial system.

The two strands of the course are brought together to help understand how the current global financial crisis arose and is playing out. We examine issues such as the mechanics of runs and the behavior of asset prices during crises. We also attempt to make sense of the actions taken by central bankers and other policy makers to address crises, historically and today. The lectures and problem sets will feature concrete examples drawn from the foreign-exchange, equity, and bond markets.
Prerequisites

The course assumes basic familiarity with probability and statistics, instruments of the financial markets, and asset pricing models. It’s appropriate for graduate students as well as advanced undergraduates who meet these requirements.

Assignments and grades

There will be two assignments, giving students the opportunity to rehearse the quantitative techniques and concepts presented, as well as a final exam. Grades will be based primarily on the assignments and exam, but some weight will also be placed on class discussion.

The Teaching Assistants for the course are Yunhan Chang (e-mail: yc2963@columbia.edu) and Satya Vandrangi (e-mail: sv2440@columbia.edu).

Schedule and location

Wednesdays, 7:00–9:30 p.m., Oct. 21–Dec. 2, 2015
833 Mudd
The final exam will be given during the second half of the final class session on Dec. 2.

Textbooks and resources

The main textbook is Malz (2011). There’s a short bibliographical essay at the end of each chapter of the textbook, and I’ve listed more recent publications and other additional readings for each lecture in a separate document. A complete set of lecture notes, including material we won’t have time for in class, is available at http://www.columbia.edu/~amm26/.

Among the rich resources on the Internet are:

Bank for International Settlements is a service provider to the world’s central banks. It invests reserves on behalf of some central banks. It also has a research department of its own and hosts regulator groups and research conferences. A large number of key regulatory documents are posted on its website: http://www.bis.org/
Central banks such as the Bank of England and the European Central Bank have large research departments that publish research and surveys related to risk management. Some have recently begun to publish separate journals devoted to financial stability issues. A good starting point is the BIS’ links collection: http://www.bis.org/cbanks.htm.


International Monetary Fund has a crucial role in the international financial system, particularly as a lender to poor countries. They conduct a large financial research effort, including the semi-annual *Global Financial Stability Report*, which can be found on its website: http://www.imf.org/external/pubs/ft/GFSR/index.htm.

Students are encouraged to become familiar with economic and financial data. The captions of the graphs in the lecture slides generally contain detailed information on data sources.

**Lecture 1  The contemporary financial system**

*Market risk basics*

- Financial intermediation
- Post-1960’s changes in the financial system
- Broader economic and policy developments
- Introduction to financial risk
- The standard asset pricing model
- Volatility measurement and estimation

**Lecture 2  Measuring market risk: Value-at-Risk**

- Value-at-Risk
- Evaluating the accuracy of Value-at-Risk
Lecture 3  Credit and counterparty risk

- Default, migration, bankruptcy
- Capital structure and credit risk
- Measuring credit and credit spread risk
- Credit risk models
- The single-factor credit risk model
- Credit portfolios

Lecture 4  Portfolio credit Value-at-Risk
Liquidity risk and leverage

- Portfolio credit VaR
- Funding liquidity
- Leverage
- Market liquidity risk

Lecture 5  Financial crises

- Typical features of financial crises
- Behavior of asset prices during crises
- Causes of financial crises
- Anticipating financial stress

Lecture 6  Role of Central Banks in Financial Crises

- Crises and the lender of last resort function
- The Fed’s crisis response
- The economics of unconventional monetary policy
- The debate on unconventional monetary policy
- Exit from unconventional monetary policy
Lecture 7  Financial regulation

- Purpose and scope of financial regulation
- Capital standards for banks
- Issues in regulation before and after the crisis
- Financial stability policy

References


October 22, 2015