Money and Banking (ECON UN3265)

Meeting time: Tu, Th 2:40 - 3:55
Meeting place: Northwest Corner 501

Office address: IAB 1001B
Office hours: Th 11:15 - 12:45 and other times by appointment

Course Objective

The modern banking and financial system is highly interconnected and characterized by many different types of players and institutions as well as a high pace of innovations. This course provides a comprehensive view on the evolution of banking, from the eighteen century to the most recent financial innovations in wholesale banking, in funding markets and crypto asset markets and discusses two main themes.

The first central theme will be that the fundamental principle of money and banking is the same despite all financial innovations and the evolution of institutions and markets in the last two hundred or more years. The second and reoccurring theme is about the causes of a financial crisis. An opinion often articulated in popular and policy discussions is that the financial crisis in 2007/08 and previous systemic financial crises were caused by the misbehavior of bankers.

This course employs different methodologies to approach these two main themes. In order to understand the working of the banking system and its benefits and costs for society a historical perspective and conceptual frameworks are needed. History and economic theory will highlight the (few) fundamental principles of money and banking and can provide a broader context to discuss the question whether a systemic financial crisis is caused by financial greed and excessive risk taking and whether bankers are more entrenched and self-centered than corporate
managers, tax advisors, lawyers, politicians or other professionals. A better understanding of these two main themes will have significant implications for the management and internal governance of banks, the use of technology and big data in financial services, policy design, banking and financial regulation as well as intervention during a financial crisis.

The course is divided into two broad sections. Section I discusses money and banking since the 18th century. Section II focuses on policy responses and banks’ reactions to regulations since the financial crisis in 2007/08 as well the most recent trends and the impact of technology and big data on banking and finance. In particular, the following topics are covered.

I.1. Evolution of the Banking System  
I.2. Bank Holding Companies  
I.3. New Forms of Money and Banking  
I.4. The Financial Crisis in 2007/08  

II.1. Central Bank Policies and Interventions  
II.2. New Regulation and Unintended Liquidity Consequences  
II.3. Market Making and Risk Management of Banks  
II.4. Most Recent Trends  

Methodologies

The course employs four different methodologies to understand the fundamental as well as specific issues of money and banking. These approaches will provide different but complementary perspectives on the same subject matter.

Institutional Analysis

The institutional analysis focuses on the structural aspects of institutions, markets and products. We will analyze the banking structure during the Free Banking Era and the National Banking Era as well as the modern commercial, investment and wholesale banking industries. We discuss new forms of money and banking and have a detailed description of the players and products in the money market fund (MMF) industry, the syndicated loan markets, the securitization markets for mortgage-backed securities (MBS), asset-backed securities (ABS), asset-backed commercial papers (ABCP), collateralized debt obligations (CDO) and collateralized loan obligations (CLO) as well as the sales and repurchase agreement (repo) markets. These are multi trillion dollar markets each and they constitute fundamental parts of the modern financial system. In order to better understand these markets, we will look at legal documents such as a repo master agreement, a bond issuance prospectus, syndicated loan prospectus, equity initial public offering
(IPO) prospectus as well as a private placement memorandum of MBS and synthetic CDOs. Furthermore, we will discuss the most recent trends and the impact of technology on banking and finance. In particular, we analyze the rapid rise and dominance of Chinese firms in fintech and the design of crypto stablecoins.

**Theoretical Analysis**

The theoretical analysis provides the conceptual foundation and interpretation of institutional structures. In other words, it seeks to answer the question about why institutions, markets and products are organized and structured as they are. A common feature of all types of banking whether it is in the Free Banking Era or modern repo markets, is the prevalence of debt-on-debt. Free banknotes are debt contracts which are backed by state bonds which are debts. National banknotes are debt backed by government bonds. Demand deposits are debt contracts which are backed by the bank’s portfolio of loans and other debt instruments. MMF shares are (de facto) debts that are backed by a portfolio of other short term debt securities. Securitized products such as MBS, ABS, CDO, CLO and ABCP are debts that are backed by mortgages, credit card receivables, student loans and corporate loans, respectively, which are all debt securities. Similarly, repo is a debt contract that uses other debt instruments as collateral. We use the concept of information sensitivity as a unifying framework to provide a micro-foundation for the optimality of debt-on-debt and explain the differences between banks and money markets on one hand and capital markets on the other hand as well as the role of rating agencies in debt markets. This theory does not only explains the prevalence of debt-on-debt in banking and funding markets but also what triggers a bank run and financial crisis without assuming moral hazard. The theoretical framework highlights the common structure of money and banking throughout history and provides a better understanding of financial innovations.

**Empirical Analysis**

Only empirical evidence and data can tell which hypothesis, story and theory is the most plausible and relevant explanation of a financial crisis. We will discuss several academic studies of popular opinions. (1) Are there systematic evidences for Wildcat banking during the free banking era? (2) Did deposit insurance lead to risk taking and bank failures? (3) Are there systematic adverse selections in securitization markets? (4) Are there empirical evidences for Wildcat CLOs? (5) How did the collapse of the markets for ABCP, Prime MMF and repo evolve? (6) In particular, we summarize the accumulating amount of recent empirical evidences for the new information sensitivity theory of debt and financial crises introduced in the course. Empirical studies that use large data sets and sophisticated empirical methods are the most convincing way to provide systematic evidences for or against a hypothesis.
Case Studies

We will discuss a number of specific cases to highlight institutional details. (1) The JPMorgan and Goldman Sachs business model case illustrates the structure and complexity of modern bank holding companies. (2) The Goldman Sachs Abacus case illustrates the complex structure of a synthetic CDO which combines techniques used in securitization and credit default swaps markets and highlights conflicts of interests between issuers and investors. (3) The Lehman Brothers Bankruptcy case illustrates the management of the balance sheet, the use of repo 105, and global contagion. (4) The JPMorgan London Whale case illustrates risk models, risk management practices and hedging versus proprietary trading. (5) The Basel III case illustrates how banks respond to regulation and minimize the impact of the liquidity coverage ratio by developing new financial products such as callable commercial papers. (6) The Volker Rule case illustrates how CLO issuers respond to the risk retention rule in securitization by creating new vehicles such as a Majority Owned Affiliate (MOA) or capitalized MOA and shows how new regulation leads to new financial innovations. (7) The Sears, Roebuck case illustrates the discussion of fintech in 1970s. (8) The JPMorgan digital strategy case illustrates the importance of mobile payment as a gateway to technology driven banking. (9) The Alibaba Ant Financial case illustrates the state of the art usage of big data and machine learning technology in banking and finance and why Chinese fintechs are innovation leaders in this field. (10) The Terra Luna algorithmic stablecoin case highlights the similarity between crypto money and bank notes in the Free Banking Era and shows that technology per se does not create trust if money is not backed by information insensitive collateral assets.

Course Requirements

The main course requirements are homework assignments (four exercise sets), a midterm exam and a final exam. Grades will be allocated based on the following weights:

- Exercise sets: 15%
- Midterm exam: 40%
- Final exam: 45%

Students are allowed to work together on exercise sets. However, students must submit their homework individually on Coursworks. In case of collaboration, the names of students working together should be stated on the first page of the solution sheet.

Working on the homework assignments is an important part of this course. Students are expected to spend a considerable amount of time working through lecture notes and exercise sets.
It is important to be regular in preparations for this course. Important concepts will be developed through both lectures and exercise assignments.

Suggested readings for each class can be downloaded from posted online links given in the respective lecture notes. Only materials discussed in class are relevant for the exam.

Please ask questions during the lectures. Critical comments are highly appreciated.

Students are welcome to talk to me if they need career advice and want to hear my opinion.

Readings

Lecture notes (Slides)

Comprehensive teaching notes are posted on Courseworks for each class session.

Textbooks (recommended but not required)


Optional readings

The following extensive list of papers can be downloaded from JStor or ScienceDirect and the most relevant papers can be accessed through an online link given in the lecture notes.


D’Amico, S., V. Kurakula, and S. Lee (2020): Impacts of the Fed Corporate Credit Facilities through the Lenses of ETFs and CDX, working paper.


Fannie Mae (2012): Basics of Fannie Mae Single-Family MBS.


Hammerling S.N. (2019): Information, insurance, and interaction: the municipal bond market after the monolines, working paper.


International Monetary Fund (2017): Fintech and Financial Services: Initial Considerations, Staff Discussion Notes, No. 17/05.

Iorgova, S. and C. P. Ross (2021): Investor Information and Bank Instability during the European Debt Crisis, IMF working paper.


Tentative Course Outline

Lecture 1

Course Overview
Introduction

Lecture 2 (Evolution of the Banking System)

The Relevance of History
Historical Overview
The Free Banking Era
The Wildcat Banking Hypothesis

Rolnick and Weber (1985)

Lecture 3 (Evolution of the Banking System)

Empirical Test of the Wildcat Banking Hypothesis
The National Banking Era
Banking Panics during the National Banking Era
Clearinghouse and Suspension of Convertibility

Rolnick and Weber (1984)

Lecture 4 (Evolution of the Banking System)

A Model of Bank Runs
Information Sensitivity: A Measure of Default Risks

Diamond and Dybvig (1983); Diamond (2007);
Royal Swedish Academy of Sciences (2022);
Dang, Gorton and Holmstrom (2015b)
Lecture 5 (Evolution of the Banking System)

Bank Diversification dominates Individual Diversification
Banking Panics and Business Cycle
The Great Depression
Speeches and the Recreation of Confidence

*Dang, Gorton and Holmstrom (2015b); Gorton (1988); FDIC (1998)*

Lecture 6 (Evolution of the Banking System)

Federal Deposit Insurance Corporation (FDIC)
Deposit Insurance, Information Sensitivity and Confidence
Glass-Steagall Act and the 3-6-3 Rule in Commercial Banking
The Rise of Debt Market Finance in 1980s

*FDIC (1998); Walter (2006)*

Lecture 7 (Evolution of the Banking System, Bank Holding Companies)

Bank Merger Waves and Industry Consolidation
The Structure of Bank Holding Companies
Case: Business Model of Goldman Sachs and JPMorgan Chase

*Jones and Critchfield (2005); Avraham, Selvaggi and Vickery (2012)*

Lecture 8 (Bank Holding Companies)

Investment Banking
M&A Business
Syndicated Loan Business

*Armstrong (2003); Standard & Poor’s (2011)*
Lecture 9 (Bank Holding Companies)

Bond Underwriting Business  
Equity Underwriting Business  
Asset Management Business  

*Bond Market Association (2004a)*

Lecture 10 (New Forms of Money and Banking)

Information Sensitivity and the Value of Information  
The Role of Rating Agencies in Bond and Money Markets  
Money Markets versus Stock Markets  

*Dang and Felgenhauer (2012); Holmstrom (2014)*

Lecture 11 (New Forms of Money and Banking)

Production of Money and Secret Keeping  
The Evolution of Opacity in Banking and Shadow Banking  
Overview of Money Market Instruments  

*Dang, Gorton, Holmstrom and Ordonez (2017); Federal Reserve Bank of Richmond (1998)*

Lecture 12 (New Forms of Money and Banking)

Money Market Fund Industry  
MMF Secret Keeping: Rule 2a-7  
Securitization: Basics and History  

*Comptroller Handbook (1997); Gorton and Metrick (2013)*
Lecture 13 (New Forms of Money and Banking)

Agency MBS
The Financial Infrastructure of Securitization
The Markets for Private Label Securitized Products

Fannie Mae (2012); Cetorelli and Peristiani (2012);
Bond Market Association (2004b)

Lecture 14 (New Forms of Money and Banking)

The Market for ABCPs
CLO Managers: The Who is Who in Private Equity
Empirical Test of the Wildcat CLO Hypothesis

Ares (2018); Fitch (2017);
Benmelech, Dlugosz and Ivashina (2012)

Lecture 15 (New Forms of Money and Banking)

Synthetic CDOs
Case: Goldman Sachs Abacus Deal
Case: SEC versus Goldman (Abacus)

SEC (2010)

Lecture 16 (New Forms of Money and Banking)

Sales and Repurchase Agreement (Repo)
A Theory of Repo Trading and Haircut
Wholesale Funding Markets

Euroclear (2009);
Dang, Gorton and Holmstrom (2013);
BNY Mellon and PWC (2015)
Lecture 17 (New Forms of Money and Banking)

Chinese Shadow Banking
Corporate Fundraising Scandal and Loan Pricing

Dang, Wang and Yao (2014); Dang, Liu, Wang and Yao (2019); Dang, Mo and Li (2019); Bai, Dang, He and Lu (2022)

Lecture 18 (The Financial Crises in 2008)

The Housing Market, Subprime Loans and Subprime MBS
The ABX.HE Index: Mechanics and Information Revelation
A Chronology of Events

Ashcraft and Schuermann (2008)

Lecture 19 (The Financial Crises in 2008)

Run on ABCPs
Run on Repos and Prime MMFs
Liquidity, Accounting and Collateral Calls
Case: Lehman’s Bankruptcy

Covitz, Liang and Suarez (2013); Gorton and Metrick (2012);
Schmidt, Timmerman and Wermers (2016);
Wiggins, Piontek and Metrick (2014)

Lecture 20 (The Financial Crises in 2008)

Case: Lehman’s Balance Sheet Management and Repo 105
Information Sensitivity and Optimal Security Design
A Theory of Debt-on-Debt

Wiggins and Metrick (2014a,b,c);
Dang, Gorton and Holmstrom (2015a)
Lecture 21 (The Financial Crises in 2008)

The Information Sensitivity Theory of Financial Crises
Empirical Evidences for the Information Sensitivity Theory

Dang, Gorton and Holmstrom (2015a); Dang, Gorton and Holmstrom (2020);
Gallagher, Schmidt, Timmermann and Wermers (2020);
Brancati and Macchiavelli (2019); Perignon, Thesmar and Vuilleme (2018);
Anderson and Copeland (2019); Cashin, Syron-Ferris, and Klee (2020);
Arnold and Rhodes (2021); Dang, Li and Wang (2022b)

Lecture 22 (Central Bank Policies and Interventions)

The Fed: Mission and Conventional Policies
Rescue Lending and Asset Purchase when Funding Markets Collapse
TARP and Supervisory Actions
Profits of the Rescue Policies in 2008
Funding Markets Interventions in 2020

Gorton and Metrick (2014); Webel (2013)

Lecture 23 (New Regulation and Unintended Consequences)

Overview of Regulatory Responses
Dodd Frank Act
MMF Reform and Triggered Redemptions
Transparency in Prime MMF Industry: Costs without Benefits
Overview of Basel III
Case: Liquidity Coverage Ratio and Callable Commercial Papers

Treasury Department (2009);
Report of the President’s Working Group on Financial Markets (2010);
Cipriani and La Spada (2021);
McNamara, Wedow and Metrick (2014);
Namara, Bennett and Metrick (2014)
Lecture 24 (New Regulation, Market Making and Risk Management of Banks)

Funding Mix of Banks
Case: Risk Retention Rule and the Rise of MOA and CMOA
Bank Risk Management
Value at Risk (VaR)
Case: JPM London Whale
Case: JPM Risk Limits and Hedging versus Proprietary Trading

Zeissler, Arwin and Metrick (2014a,b,c);
Zeissler, Bennett and Metrick (2014)

Lecture 25 (Most Recent Trends)
Information Insensitivity View on Negative Yields, QE and QT
Alternative Asset Managers as Credit Providers
Technology and Finance
Case: Sears, Roebuck and Fintech in 1970s
Case: JPMorgan Chase Digital Strategy

IMF (2017); BIS (2018)

Lecture 26 (Most Recent Trends)
Chinese Fintech as Innovation Leaders
Case: Ant Financial
Case: Terra Luna Stablecoins
Innovation, Regulation and Information Sensitivity in Banking

Gorton and Zhang (2021)