15F019
Asset Prices and Market Frictions

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Introduction
This course provides a rigorous panoramic analysis of the interplay between asset pricing theory and the empirical evidence with and without illiquidity related market frictions. We present a unified treatment of asset pricing models using the stochastic discount factor framework, and discuss several key aspects of asset pricing as consumption risk, time-varying expected returns, predictability of future returns, non-separable preferences, and multi-factor asset pricing models. Then, we discuss the concepts of liquidity, order flow and price dynamics, the determinants of market illiquidity, the decisions in limit order book (LOB) markets, and high frequency trading. Finally, the course combines both areas to discuss asset pricing with funding and liquidity frictions, and intermediary asset pricing models.

Objectives
- Understand the foundations of asset pricing and the implications for investments and asset allocation
- Learn advanced issues of asset pricing under the stochastic discount factor framework
- Understand the importance of factor risks for asset pricing and asset allocation
- Understand the distinction between static and intertemporal asset pricing models
- Learn how to implement asset pricing empirical tests
- Understand how security markets are organized and how their liquidity can be measured
- Learn how various market imperfections affect price formation, liquidity, and speed of price discovery
- Understand how the interaction of order flow and price movements can be used to assess the relative importance of determinants of liquidity
- Learn how to introduce market frictions (market and funding liquidity) into asset pricing models
- Understand the impact of leverage constraints of financial intermediaries on asset pricing

Required Background Knowledge
The target audience for this course is economics and finance graduate students. The course presumes some exposure to undergraduate finance, economics, statistics and econometrics. The grade will be based on weekly problems and empirical exercises with real data and a final exam.
Learning Outcomes
The students will learn how to implement advanced investment decisions under market frictions represented by market and funding liquidity, and by leverage constraints.

Methodology
The course is a combination of theory and empirical exercises with real data and problems. Students will learn the issues involved in the course by doing exercises with real data.

Evaluation
Weekly exercises by groups of 3 people will represent 40% of the grade. A closed book final exam will represent 60% of the course. All students must obtain at least 4 points out of 10 in the final exam for the 40% of the group exercises to be taken into account in the final grade.

Course contents
Part I: Asset Pricing (Prof. G. Rubio)

1. Frictionless Asset Pricing Models

1.1 Macroeconomic Foundations of Asset Pricing

1.1.1 Time-varying expected returns and basic moments of portfolio returns
1.1.2 The basic consumption-based asset pricing model
1.1.3 Risk and expected return
1.1.4 Time-varying expected returns and predictability
1.1.5 Risk-neutral pricing
1.1.6 Consumption-based pricing under power utility
1.1.7 The equity premium puzzle and the Hansen-Jagannathan volatility bound

1.2 Classic and Intertemporal Asset Pricing Models with Non-Separability

1.2.1 Overview
1.2.2 Factor asset pricing models
  1.2.2.1 The stochastic discount factor and the CAPM
  1.2.2.2 The conditional capital asset pricing model
1.2.2.3 The intertemporal capital asset pricing model (ICAPM): basic principles
1.2.2.4 The Fama-French three (five) factor model and the momentum factor
1.2.3 Testing multifactor asset pricing models
1.2.4 Factor asset pricing models: the empirical evidence  
1.2.5 The stochastic discount factor under recursive preference  
1.2.6 The habit-based asset pricing model  

Part II: Liquidity and Trading Frictions (Prof. R. Pascual)  

1. Liquidity  
1.1. What liquidity is and why does it matter?  
1.2. Liquidity provision  
1.3. Measuring liquidity  

2. Order flow, liquidity and securities price dynamics  
2.1. Price dynamics and the efficient market hypothesis  
2.2. Price dynamics with informative order flow  
2.3. Price dynamics with order-processing costs  
2.4. Price dynamics with inventory risk  
2.5. Trade size and market depth  

3. Estimating the determinants of market illiquidity  
3.1. Bid-ask spread decomposition  
3.2. Measuring the permanent impact of trades  
3.3. Estimating the probability of informed trading  

4. The make or take decision in limit order book (LOB) markets  
4.1. The risks of submitting a limit order  
4.2. Determinants of the bid-ask spread in LOB markets  
4.3. The make and take decision and the state of the LOB  

5. Commonality in liquidity  
5.1. What is it?  
5.2. International evidence  
5.3. What causes commonality in liquidity?  

6. A brief introduction to liquidity, asset prices, and corporate policies  
6.1. The illiquidity premium  
6.2. Market liquidity and corporate policies  
6.3. Corporate policies and market liquidity  

7. High frequency trading and liquidity  
7.1. Algorithmic trading and high-frequency trading (HFT)
7.2. HFT trading strategies
7.3. HFT and its impact on liquidity
7.4. Empirical evidence
7.5. HFT and market quality
7.6. Market fragmentation

Part III: Asset Pricing and Trading Frictions (G. Rubio)

Asset Pricing with Frictions: Liquidity-Adjusted Asset Pricing Models

1.1 Liquidity Risk: Market-Wide Liquidity Shocks and Asset Pricing
1.2 Liquidity Crisis and Funding Liquidity: The Margin-based CAPM
1.3 Intermediary Asset Pricing Models

Specify a description, materials and cases that will be worked in class:

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Bibliography

References:
Part I:
* Rubio, G. (2016), (Class Notes 1.1).
* Campbell, J. (2003), Consumption-Based Asset Pricing, Chapter 13 (pages 803-828), in Handbook of the Economics of Finance.
* Rubio, G. (2016), (Class Notes 1.2)
* Cochrane, J. (2005), Asset Pricing, Princeton University Press. Chapters 8, (pages 149-165) and 20 (pages 435-453)
* Campbell, J. (2003), Consumption-Based Asset Pricing, Chapter 13 (pages 829-887), in Handbook of the Economics of Finance.

Part II:

Part III:
* Rubio, G. (2016), (Class Notes 3.1)

Professor’s Biography

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Asset Prices and Market Frictions

Bachelor in Business Economics
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Master in Business Administration (MBA)
Columbia University, New York
Ph.D. in Business Administration (Finance)
University of California at Berkeley
Title: Asset Pricing and Equity Rights Issues (Chairman: Jay Shanken)

AREAS OF INTEREST
Asset Pricing
Derivative Pricing
Macroeconomics and Finance
Financial Econometrics

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EDUCATION
Bachelor in Business Administration
University Jaume I, Castellón
Ph.D. in Business Administration
University Carlos III
Title: Market Microstructure, Adverse Selection Costs and Liquidity (Chairman: Álvaro Escribano and Mikel Tapia)

AREAS OF INTEREST
Market Microstructure
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Financial Economics

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