MIT MANAGEMENT SLOAN SCHOOL

Eben Lazarus, Deborah Lucas, Kerry Siani Fall 2022

Preliminary Syllabus

15.472 Advanced Asset Pricing

Students will develop a basic mastery of the leading theoretical, empirical, and computational tools for conducting academic research in asset pricing, macro-finance, and portfolio choice, along with a critical understanding of the literature and some current areas of active research. The lectures will encompass theory, econometric and computational methods, and analysis of empirical studies. Topics include utility-based equilibrium modeling; cross-sectional and time-series asset pricing models; intermediary asset pricing; liquidity effects; and an introduction to continuous-time finance. Please see "Course Schedule and Readings" for the precise topics to be covered in the course this year. The course is designed to help jump-start PhD dissertations. The grade is based on a term paper with a presentation requirement and graded assignments.

Class Schedule

The class meets twice per week: Tues. and Thurs. 2:30 – 4:00pm, E62-687, with the exception of: Tues. 9/13 (no class); Thurs. 9/15 (class meets 2:30 – 5:30pm to make up missed class 9/13); Tues. 10/11 (holiday); Tues. – Thurs. 10/25 – 27 (SIP week); and Thurs. 11/24 (Thanksgiving).

Recitations

The TA will hold recitations to review class material and work through additional applications and exercises. The TA is J.R. Scott, justinsc@mit.edu. Recitation sessions will take place on Fridays 11:00 am – 12:00 pm in E62-374.

Course Website

The course website is on Canvas (https://canvas.mit.edu/courses/17221), and all teaching materials and class announcements will be posted there.

Office Hours

Kerry Siani: Flexibly by appointment, set up by email ksiani@mit.edu
Eben Lazarus: Thursday 4:00 – 5:30pm in E62-633 or by appointment elazarus@mit.edu
Deborah Lucas: Flexibly by appointment, set up by email dlucas@mit.edu

Course Administrative Assistant

Danny Martin, dmmartin@mit.edu, E62-631

Prerequisites

This course is designed for Ph.D. students in finance, economics, and related areas. It is recommended that students have already taken graduate level econometrics, microeconomics and introductory financial economics. Knowledge of macroeconomics is helpful but not required.

Course Requirements and Grading

There is no final exam. The following weighting scheme will be used to determine each student's course grade:

- Regular attendance and class participation: 20%.
- Homework assignments: 40%.
- Research note/paper: 40%. (Proposal due November 3; paper due on December 11; in-class presentations December 13.)

Course Materials

Class Notes, Problem Sets, and Recitation Notes: These will be available on the course website.

Textbooks: Recommended textbooks for this course are:

- Campbell, *Financial Decisions and Markets: A Course in Asset Pricing*, Princeton University Press, 2018.
- Back, *Asset Pricing and Portfolio Choice Theory*, 2nd Ed., Oxford University Press, 2017.
- Duffie, *Dynamic Asset Pricing Theory*, 3rd Ed., Princeton University Press, 2001.
- Cochrane, *Asset Pricing*, Revised Ed., Princeton University Press, 2005.

We will refer mostly to readings from Campbell and Back, but you may find the perspectives of Duffie and Cochrane to be useful supplements. In addition, the classes will cover papers that are listed below with the individual classes. These will be subject to revision.

Sloan Values

You are responsible for upholding Sloan's code of conduct, which mandates zero tolerance for cheating and plagiarism. For more details on Sloan's academic policies, please read the document "Classroom Values in Practice," which is available on the course website.

Course Schedule

This is an approximate schedule for the course; some material may take longer or shorter to cover than the times indicated.

Week 1: Introduction and Stylized Facts (9/8)

Instructors: Siani, Lazarus

Topics: Overview of course objectives; time-series and cross-sectional stylized facts; review and limits of Euler Equations, discount rates, APT and role of models.

Readings:

- Required: Cochrane (2005) Chapters 1 and 20, Cochrane (2011), Campbell (2018) Chapter 5
- Optional: Prefaces for the recommended textbooks, Cochrane (Chapters 3–6 for review), Goyal and Welch (2008), Brunermeier et al. panel discussion at the fall 2019 NBER AP meeting on the present and future of AP (2021, https://doi.org/10.1093/rfs/hhaa129), Campbell (2003) handbook article on consumption-based pricing.

Week 2: Utility-based pricing models (I/II): Recap, critique, and partial synthesis of models with representative agents (9/15, 2:30pm to 5:30pm)

Instructor: Deborah Lucas

Topic: C-CAPM, habit, long-run risk, rare disasters, "puzzles," limits to aggregation

Readings:

- Required: Campbell (Chapter 6), Parker and Julliard (2005), Bansal, Kiku, and Yaron (2012), Campbell on aggregation pg 88-89
- Recommended: Beeler and Campbell (2012), Campbell and Cochrane (1999), Lettau and Ludvigson (2009); Cochrane (Chapter 2, 9.1-9.3), Rietz (1988), Barro (2009), Gourio (2012), Julliard and Gosh (2012), Tsai and Wachter (2015)
- Further optional readings on beliefs: Greenwood and Shleifer (2014), Nagel and Xu (2019), De La O and Myers (2020)

Week 3: Utility-based pricing models (II/II): Heterogeneous agents and incomplete markets (9/20 & 9/22)

ASSIGNMENT 1 DUE 9/22

Instructor: Deborah Lucas

Topic: Sources of heterogeneity, when it matters and when it doesn't, non-participation, technical approaches and challenges

Readings:

- Required: Campbell 10.1, 10.2; 11.1, 11.2
- Recommended: Mankiw (1986), Heaton and Lucas (1996 & 2000), Constantinides and Duffie (1996)
- Optional: Aiyagari (1993), Lucas (1994), Constantinides, Donaldson and Mehra (2002)

Week 4: Portfolio choice; and pricing public assets and liabilities (9/27 & 9/29)

Instructor: Deborah Lucas

Topics: Portfolio choice with heterogeneity, frictions, and long-run risk; social discount rate(s), cost of carbon, social security liabilities, too-big-to-fail guarantees

Readings:

- Required: Benzoni, Collin Defresne, and Goldstein (2007)
- Optional: Herskovic, Moreira, and Muir (2019), Weitzman (2007 & 2009), Geanakoplos and Zeldes (2011), Lucas and Zeldes (2006), Merton (1977 & 1978), Lucas and McDonald (2010), Arrow (1995), Viscusi (2007), Gollier(2014), Newell and Pizer (2003), Pindyk (2011), Lucas (2019)

Week 5: Liquidity; and institutional asset pricing (10/4 & 10/6)

ASSIGNMENT 2 DUE 10/6

Instructor: Deborah Lucas (10/4), Kerry Siani (10/6)

Topic: Trading costs, asymmetric information; heterogeneous beliefs; financial institutions and asset prices; collateral & endogenous liquidity; liquidity in fixed income markets; microstructure; safe asset demand

Readings:

- Required: Campbell (chapter 11.3, 11.4); Campbell (Chapter 12); Pastor and Stambaugh (2003), Berk and Green (2004), Koijen and Gabaix (2020)
- Recommended: Anderson and Stulz (2017), Berk and van Binsbergen (2017); Parker, Schoar, and Sun (2020), Duffie's Presidential Address (2010), Koijen and Yogo (2019)

Week 6: Market microstructure (10/13)

Instructor: Kerry Siani

Topic: Microstructures, dealers, search and bargaining frictions

Readings:

- Required: Duffie, Garleanu and Pedersen (2005), Glosten and Milgrom (1985)

- Recommended: Amihud and Mendelson (1986), Kyle (1985), Hendershott, Livdan and Schurhoff 2020

Week 7: Asset pricing in continuous time (I/IV): Introduction (10/18 & 10/20)

ASSIGNMENT 3 DUE 10/20

Instructor: Eben Lazarus

Topics: Introduction to continuous-time mathematics and modeling tools; arbitrage and martingales

Readings:

- Recommended: Back (2017) Chapter 12 & Appendix A, Duffie (2001) Chapter 5
- Optional: Duffie (2001) Appendix C–E

Week 8: Term Structure Models (11/1 & 11/3)

PAPER PROPOSAL DUE 11/3

Instructor: Kerry Siani

Topic: Term structure models in discrete and continuous time, expectations hypothesis and failures, currencies

Readings:

- Required: Cochrane and Piazzesi (2005), Lettau and Wachter (2007)
- Recommended: Lettau and Wachter (2011), Campbell and Shiller (1991)

Week 9a: Corporate Credit and Bonds (11/8)

Instructor: Kerry Siani

Topic: Credit and bond pricing, time series patterns, credit spread puzzle

Readings:

- Required: Gilchrist and Zakrajsek (2012), Collin-Dufresne, Goldstein, Martin (2001)
- Recommended: Merton (1974), Greenwood and Hanson (2013), Nozawa (2017), Chen Collin-Dufresne Goldstein (2009), Huang and Huang (2012)

Week 9b: Asset pricing in continuous time (II/IV): Pricing in complete markets (11/10)

ASSIGNMENT 4 DUE 11/10

Instructor: Eben Lazarus

Topics: Applications of arbitrage and martingales; Black-Scholes; portfolio choice in continuous time

Readings:

- Recommended: Back (2017) Chapters 13, 14, and 16, Merton (1973), Black and Scholes (1973), Cox and Huang (1989)
- Optional: Duffie (2001) Chapters 6 and 9, Merton (1974), Carpenter (2000), Piazzesi (2010)

Week 10: Asset pricing in continuous time (III/IV): Equilibrium and CAPMs; incomplete markets and heterogeneity (11/15 & 11/17)

Instructor: Eben Lazarus

Topics: CAPM solutions in continuous time; dynamic programming; incomplete markets; margin constraints

Readings:

- Recommended: Duffie (2001) Chapters 9–10, Back (2017) Chapters 14–15, Liu and Longstaff (2004)
- Optional: Bertsimas, Kogan, and Lo (2001), Cochrane, Longstaff, and Santa-Clara (2008), Martin (2013)

Week 11: Asset pricing in continuous time (IV/IV): GE in incomplete markets and applications (11/22)

Instructor: Eben Lazarus

Topics: Duality approach for GE with incomplete markets; introduction to intermediary-based pricing

Readings:

- Recommended: Cvitanic and Karatzas (1992), Basak and Cuoco (1998), Brunnermeier and Sannikov (2016)
- Optional: Gârleanu and Pedersen (2011), Gârleanu and Panageas (2015), Hansen, Huang, Khorrami, and Tourre (2018)

Week 12: Cross-sectional and intermediary asset pricing applications (11/29 & 12/1)

ASSIGNMENT 5 DUE 12/1

Instructor: Kerry Siani

Topic: Cross-sectional asset pricing (11/29), intermediary asset pricing (12/1)

Readings:

- Required: Cochrane (Chapters 10 and 11), He and Krishnamurthy (2018)

- Recommended: Fama and French (1993), Bai, Bali and Wen (2019)
  He and Krishnamurthy (2013), Adrian, Etula and Muir (2014), Adrian and Shin (2010), He, Kelly and Manela (2017)

Week 13: Recent advances and applications (12/6 & 12/8)

Instructor: Eben Lazarus

Topics: Open to student input; current likely topics include beliefs, learning, and asymmetric information; derivatives and risky term structures; and course wrap-up

Readings:

- Recommended: Brennan (1998), Veronesi (1999), Martin and Papadimitriou (2021)
- Optional: Geanakoplos (2010), Simsek (2013), Detemple (1986), Gârleanu and Pedersen (2011), Gârleanu and Panageas (2015), Andrei and Hasler (2015), Back (1992), Wang (1993), Campbell (2018) Chapters 9, 11, and 12, van Binsbergen and Koijen (2017), Cochrane (2021), Gormsen and Lazarus (2021), Kogan and Papanikolaou (2012), Brunnermeier et al. (2021)

Paper/note due December 11

Last class, December 13: Students' Research Presentations

Instructors: Lazarus, Lucas, Siani