ECON-GA 2021 — Financial Economics I

NYU, Fall 2014 — Topics in Asset Pricing Theory

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Syllabus

Lecture:	19 W 4th Street, room 736	Mon 9 am – 12 pm
Office hours:	19 W 4th Street, room 714	open door / by appointment

1 Course description

The purpose of this course to provide an introduction to the frontier of research in asset pricing theory. We will cover technical tools and modeling strategies that will help us understand the empirical predictions of various modern asset pricing models.

2 Course requirements and grading

This course is intended for PhD students who are interested in more advanced modeling in asset pricing and macroeconomics. I will put more weight on topics which you are less likely to encounter in more 'standard' asset pricing courses. Sydney Ludvigson's course and/or courses at Stern finance are recommended complements that will introduce you to the broader literature, although I do not require these courses as a pre-requisite.

There will be a take-home exam at the end of the course. I will also ask you to replicate the results of a recent paper that fits the topics and the level of the material covered in the course.

3 Reading and other materials

This section is ongoing work in progress.
Main texts:

- Duffie, Darrell (2001). *Dynamic Asset Pricing Theory.* [Duffie (2001)] Highly recommended for the first part of the course

- Øksendal, Bernt (2007). *Stochastic Differential Equations.* [Øksendal (2007)] This book provides a lot of technical detail beyond the scope of this course.

- Ljungqvist, Lars and Thomas J. Sargent (2012). *Recursive Macroeconomic Theory.* [Ljungqvist and Sargent (2012).] Improved treatment of asset pricing in complete and incomplete market setups from the macroeconomic perspective.

Other major texts provide additional background.

- Cochrane, John (2005). *Asset Pricing.* [Cochrane (2005)] This is a standard text frequently used in introductory courses.

- Karatzas, Ioannis and Steven E. Shreve (1991). *Brownian Motion and Stochastic Calculus.* [Karatzas and Shreve (1991)] There are many books that deal with continuous-time stochastic calculus. This is one of the standard references. Other textbooks include Karatzas and Shreve (1998) or Revuz and Yor (1999).

- Karlin, Samuel and Taylor, Howard M. (1981). *A Second Course in Stochastic Processes.* [Karlin and Taylor (1981)]

- Hansen, Lars Peter and Thomas J. Sargent (2008). *Robustness.* [Hansen and Sargent (2008)] For some of the discussions on non-standard preferences.

4 Course outline

This section is ongoing work in progress.

4.1 Mathematical preliminaries

- **Foundations of asset pricing** (Duffie (2001), chapters 1–4). Arbitrage-free pricing in static models; risk-neutral probabilities; equilibrium asset pricing; dynamic programming; stochastic discount factors.

- **Introduction to continuous-time calculus** (Duffie (2001), chapter 5 and appendix, Øksendal (2007), chapters 1–4; Karlin and Taylor (1981), chapter 15). Construction of the Brownian motion; diffusions; Ito's lemma; boundary behavior; Kolmogorov equation; Feynman-Kac formula, change of measure.

- **Arbitrage pricing in continuous time** (Duffie (2001), chapter 6). Decentralization, arbitrage, Black-Scholes formula.

    – primary: Harrison and Kreps (1979), Black and Scholes (1973), Merton (1973b)
    – secondary: Harrison and Pliska (1981), Dybvig and Huang (1988), Cox and Ross (1976), Ross (1978), Merton (1977), Heston (1993)

4.2 Portfolio allocation and equilibrium with complete markets

- **Porfolio allocation and consumption choice** (Duffie (2001), chapter 9). Merton's problem, martingale approach.

    – Merton (1971), Cox and Huang (1989)

- **Equilibrium economies** (Duffie (2001), chapter 10). Endowment economy model; consumption CAPM; the role of state variables and predictability.

    – Merton (1973a), Breeden (1979), Hansen and Jagannathan (1991)

4.3 Recursive preferences, ambiguity and robustness

- **Recursive preferences and preference for timing of uncertainty**. Nonseparabilities in preferences and

  - Kreps and Porteus (1978), Epstein and Zin (1989), Duffie and Epstein (1992)

- **Robust preferences** (Hansen and Sargent (2008))

- **Ambiguity aversion**

4.4 Learning

- Filtering problems in continuous-time

- Robust learning

4.5 Rational inattention, costly information, and information aggregation

- Rational inattention in asset pricing

- Information aggregation models

4.6 Constraints, frictions, and heterogeneous agents

- **Consumption allocations with multiple classes of agents**

  - Chan and Kogan (2002), Dumas (1989), Dumas, Uppal, and Wang (2000), Yan (2008), Borovička (2013)

- **Financial markets with constraints**

  - Luttmer (1996)

- **Macroeconomic models with financial frictions**

  - Brunnermeier and Sannikov (2014), He and Krishnamurthy (2012), He and Krishnamurthy (2012c), Di Tella (2012)

4.7 New methods in asset pricing theory

- **Valuation decompositions**

  - Alvarez and Jermann (2005), Hansen and Scheinkman (2009), Hansen (2012), Backus, Chernov, and Zin (2013), Borovička, Hansen, and Scheinkman (2014a)

- **Shock elasticities, nonlinear impulse response functions**

  - Borovička, Hansen, Hendricks, and Scheinkman (2011), Borovička, Hansen, and Scheinkman (2014b)

- **Large deviation methods**

    - Varadhan (1967), Fournié, Lasry, and Lions (1997), Stutzer (2003), E, Ren, and Vanden-Eijnden (2004), Borovička, Hansen, and Scheinkman (2013)

References

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