

# Booth School of Business University of Chicago

Autumn 2023

## *BUS 34901 Asset Pricing I* *Professors Lars Peter Hansen and John Heaton*

### Course Requirements and Grading

The course requirements are a Final exam and graded homework assignments.

Problem Sets	30%
Final	70%

### Review Sessions TA

- **TA:** Joe Kupferberg (jkupferberg@uchicago.edu)
- **Review Sessions:**
  - Weekly at a time to be determined.

- **Office Hours:**

Please contact us via email to setup one-on-one discussion in person or via Zoom.

### Honor Code

Students in this course are required to adhere to the standards of conduct in the Honor Code and Standards of Scholarship. Each student shall sign the following pledge on each exam: “I pledge my honor that I have not violated the Honor Code during this examination.”

## **Accommodations**

Student accommodations: The University of Chicago is committed to ensuring the full participation of all students in its programs. If you have a documented disability (or think you may have a disability) and, as a result, need a reasonable accommodation to participate in class, complete course requirements, or benefit from the University's programs or services, please contact Student Disability Services as soon as possible. To receive a reasonable accommodation, you must be appropriately registered with Student Disability Services. Please contact the office at 773-702-6000 / TTY 773-795-1186 or [disabilities@uchicago.edu](mailto:disabilities@uchicago.edu), or visit the website at [disabilities.uchicago.edu](http://disabilities.uchicago.edu). If you have an approved accommodation from Student Disability Services that you plan to use, please contact Academic Services as soon as possible. ([Accommodations@chicagobooth.edu](mailto:Accommodations@chicagobooth.edu)). Academic Services will provide support and coordinate the details of your accommodations on your behalf.

## **Inclusion**

The University of Chicago believes that a culture of rigorous inquiry demands an environment where diverse perspectives, experiences, individuals, and ideas inform intellectual exchange and engagement. I concur with that commitment and expect to maintain a productive learning environment based upon open communication, mutual respect, and non-discrimination. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration.

## Readings for the Course

- **Texts**

Required texts:

- *Financial Decisions and Markets*, by J.Y. Campbell; Princeton University Press, 2018
- *Asset Pricing* by J.H. Cochrane; Princeton University Press, 2005, 2<sup>nd</sup> edition.

- **Additional Articles**

Additional readings and articles will be posted on canvas in advance of each class during the quarter

- **Lecture Slides and Handouts**

Lecture slides will be posted in advance on canvas. You will need to bring them to class with you. The lectures slides provide an **outline of the course discussion** and some detail on the topics covered. They are not a substitute for the lectures. Simply reviewing the lecture slides and text material will not be sufficient to succeed in the course.

## Course Outline

- **Lectures 1 and 2 Topics:**

- Overview
- Static Portfolio Choice

*Readings:*

- Cochrane, Asset Pricing, Chapter 1
- Campbell, Financial Decisions and Markets, Chapters 1 and 2

- **Lectures 3-6 Topics:**

- Contingent Claims
- No Arbitrage
- Discount Factors
- M-V Frontiers
- Beta Representations

*Readings*

- Cochrane, Asset Pricing, Chapters 2, 3 and 4
- Campbell, Financial Decisions and Markets, Chapters 2, 3, 4, 5, 6 and 9

- **Lectures 7-9 Topics:**

- Factor Models
  - \* Multifactors: empirical specifications
  - \* Factor Models implied by economic models
    - Non-separability
    - Recursive utility
- Present Value restrictions and linear dynamics
- Review of Linear Impulse response functions

*Readings*

- Cochrane Chapters 8 and 9
- Campbell Chapters 5 and 9
- Hansen, Heaton Lee, and Rousanov “Intertemporal Substitution and Risk Aversion” sections 4, 6 and 7

- **Lectures 10, 11 Topics:**

- Dynamics: term structure of uncertainty and pricing
  - \* martingales and stochastic discounting
  - \* shock elasticities and impulse response functions

*Readings:* References: Borovička and Hansen (2016), Hansen (2021)

- **Lectures 11-13 topics**

- Recursive Preferences under uncertainty
  - \* Recursive Utility and Misspecification aversion
  - \* Ambiguity Aversion
  - \* Asset Pricing Illustrations

*Readings:* References: Epstein and Zin (1991), Duffie and Epstein (1992), Hansen and Sargent (2001), Chen and Epstein (2002), Hansen and Miao (2018), Hansen and Sargent (2021), Hansen and Sargent (2023)

- **Lectures 14-17 Topics:**

- Asset pricing and production economies
  - \* single capital stock economies
  - \* two capital stock economies with costly reallocation
  - \* two consumer types with financial market restrictions

*Readings:* References: Hansen et al. (1999), Basak and Cuoco (1998), Hansen et al. (2008), He and Krishnamurthy (2013), Brunnermeier and Sannikov (2014), Eberly and Wang (2012) Heaton and Lucas (1996)

- **Lecture 18 Topic:**

- Assessing asset pricing models in the presence of misspecification

*Readings:* Hansen et al. (1995), Hansen and Jagannathan (1997), Chen et al. (2021)

## References

- Basak, Suleyman and Domenico Cuoco. 1998. An equilibrium model with restricted stock market participation. *Review of Financial Studies* 11:309–341.
- Borovička, Jaroslav and Lars Peter Hansen. 2016. Term Structure of Uncertainty in the Macroeconomy. In *Handbook of Macroeconomics*, vol. 2, edited by John Taylor and Harald Uhlig, chap. 20, 1641–1696. Elsevier.

- Brunnermeier, Markus K and Yuliy Sannikov. 2014. A Macroeconomic Model with a Financial Sector. *American Economic Review* 104:379–421.
- Chen, Xiaohong, Lars Peter Hansen, and Peter G. Hansen. 2021. Robust identification of investor beliefs. *Proceedings of the National Academy of Sciences of the United States of America* 117.
- Chen, Zengjing and Larry Epstein. 2002. Ambiguity, Risk, and Asset Returns in Continuous Time. *Econometrica* 70:1403–1443.
- Duffie, D and L G Epstein. 1992. Stochastic Differential Utility. *Econometrica* 60:353–394.
- Eberly, Janice C and Neng Wang. 2012. Reallocating and Pricing Illiquid Capital: Two Productive Trees. SSRN Electronic Journal.
- Epstein, Larry G. and Stanley E. Zin. 1991. Substitution, Risk Aversion, and the Temporal Behavior of Consumption and Asset Returns: An Empirical Analysis. *Journal of Political Economy* 99:263–286.
- Hansen, Lars Peter. 2021. Uncertainty Spillovers for Markets and Policy. *Annual Review of Economics* 13:371–396.
- Hansen, Lars Peter and Ravi Jagannathan. 1997. Assessing specification errors in stochastic discount factor models. *Journal of Finance* 52:557–590.
- Hansen, Lars Peter and Jianjun Miao. 2018. Aversion to ambiguity and model misspecification in dynamic stochastic environments. *Proceedings of the National Academy of Sciences* 115:9163–9168.
- Hansen, Lars Peter and Thomas J. Sargent. 2001. Robust Control and Model Uncertainty. *The American Economic Review* 91:60–66.
- . 2021. Macroeconomic Uncertainty Prices when Beliefs are Tenuous. *Journal of Econometrics* 223 (1):222–250.
- . 2023. Risk, Ambiguity, and Misspecification: Decision Theory, Robust Control, and Statistics. *Journal of Applied Econometrics* forthcoming. SSRN Electronic Journal.
- Hansen, Lars Peter, John Heaton, and Erzo G. Z. Luttmer. 1995. Econometric Evaluation of Asset Pricing Models. *Review of Financial Studies* 8:237–274.
- Hansen, Lars Peter, Thomas J. Sargent, and Thomas D. Tallarini. 1999. Robust Permanent Income and Pricing. *Review of Economic Studies* 66:873–907.
- Hansen, Lars Peter, John C. Heaton, and Nan Li. 2008. Consumption Strikes Back? Measuring Long-Run Risk. *Journal of Political Economy* 116:260–302.
- He, Z and A Krishnamurthy. 2013. Intermediary Asset Pricing. *American Economic Review* 103:732–770.

Heaton, John and Deborah J. Lucas. 1996. Evaluating the effects of incomplete markets on risk sharing and asset pricing. *Journal of Political Economy* 104:443–487.