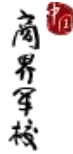




**PHBS**  
北京大学汇丰商学院



# FIN-515

## Empirical Asset Pricing

### Module 4, 2022-2023

#### **Course Information**

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**Instructor:** Aoxiang Yang, PhD

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Email: aoxiang.yang@phbs.pku.edu.cn

Office Hours: Monday & Thursday 17:30-19:30, or by appointment. Please send an email appointment in advance.

**Teaching Assistant:**

Kaihong Song, PhD Candidate

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**Classes:**

Lectures: Monday & Thursday, 15:30-17:20

Venue: PHBS Classroom 423

**Course Website:**

<https://cms.phbs.pku.edu.cn/claroline/course/index.php?cid=FIN515>

#### **Course Description**

**Course Overview:**

This course is intended for PhD students in Finance and Economics. It focuses on selected topics in empirical asset pricing. We will start by reviewing basic asset pricing notions such as no arbitrage, stochastic discount factor, risk-neutral probability, and factor/beta pricing models. Then, our course will proceed in two parts: time-series analyses and cross-sectional analyses. In each part, we have dual objectives: to explain the econometric methods, and to discuss the empirical literature.

In time-series analysis, we will first develop econometric tools such as GMM, OLS, and MLE and then show how to apply them to perform structural estimation and study return/cash flow predictability. We will then introduce the consumption-based asset pricing literature with a focus on these theories' empirical performance in equity, bond, currency, and options markets.

In cross-sectional analysis, we will again first introduce econometric tools such as cross-sectional regressions, panel regressions, and Fama-Macbeth regressions. We then show how to apply them to test linear factor/beta pricing models, starting with the CAPM. Next, we will discuss prominent developments in the cross-sectional asset pricing literature, including the size, value, momentum, liquidity, (systematic and idiosyncratic) volatility, profitability, and investment effects, as well as other anomalies. We will subsequently introduce the production-based asset pricing literature and how it addresses various anomalies. We will also briefly discuss the intermediary-based asset pricing literature. Finally, we will learn how to test conditional asset pricing models.

## Course Prerequisites:

Advanced Econometrics I is required. Students should be familiar with (both time-series and cross-section) econometrics at the graduate level and should know how to use at least one econometrics software such as STATA, SAS, and R, etc. Financial Economics, Macroeconomics, and particularly Asset Pricing Theory (or any course in that nature) at graduate level will be very helpful for this course if already taken or taken in conjunction, though they are not required.

## Textbook

The readings for the course consist of a combination of published papers, working papers, and textbook chapters. The textbooks are:

- John H. Cochrane, *Asset Pricing*, Revised Edition, Princeton University Press, Princeton 2005. In the reading list, I will refer to this book as **Cochrane. (main)**
- John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, 1997. (secondary)
- Singleton Kenneth, *Empirical Dynamic Asset Pricing*, Princeton University Press. (secondary)

## Learning Outcomes

Students will be able to understand the main contributions and techniques in the empirical asset pricing literature and learn how to apply the techniques to conduct asset pricing research.

## Grading Details

The grade for the class will be determined using the following weighting:

Final Presentation	60%
Problem Sets	30%
Class Attendance and Participation	10%

## Final Presentation

- Toward the end of the module and after our lectures are done, each student will choose a paper to present in class. The detailed presentation format and time allocation is to be announced after the number of enrollments is fixed.
- You should present either a relatively recent published/working paper that interests you or your own working paper. In the former case, you should describe a direction for follow-up research. In the latter case, describe your contribution.
- The paper should be in the field of asset pricing, broadly defined. In terms of grading, there will be no discrimination between presenting others' work or your own work.

## Problem Sets

- There will be problem sets roughly once every other week. Thus, 3-4 problem sets are expected in total. The problem sets are supposed to help you better understand data processing and research methodology in empirical asset pricing. The problem sets may or may not be graded.

## Class Attendance and Participation

Class attendance is required. Class participation is expected and encouraged. Most classes are lecture formats.

## Academic Integrity

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honor points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

For more information of plagiarism, please refer to PHBS Student Handbook.

## Course Outline

The specific topics covered during each lecture are subject to change as the class progresses. Any significant change will be announced on the course website and/or in class. Textbook Chapter below is based on **Cochrane**.

Week	Topic	Textbook Chapter
1	Introduction	Chapter 3,4,6,9
2	Structural estimation Time-series return/cash flow predictability	Chapter 10,11,14,20
3	Consumption-based asset pricing models	Chapter 1,2,5,21
4	Bond and currency markets	Chapter 19
5	Volatility and options	Chapter 17
6	Testing linear factor models: Econometrics	Chapter 12,14,15,16
7	Cross-sectional anomalies Production-based asset pricing models Intermediary-based asset pricing	Chapter 20

8	Testing conditional asset pricing models	Chapter 8,13
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## Reading List

Readings in this list are highly encouraged. You should have a solid knowledge of the main intuition, techniques, and results of each paper after taking the course. (The list is subject to change depending on our progress though)

### Structural estimation and time-series return predictability

- Hansen, Lars Peter, and Kenneth J. Singleton. "Generalized instrumental variables estimation of nonlinear rational expectations models." *Econometrica: Journal of the Econometric Society* (1982): 1269-1286.
- Campbell, John Y., and Robert J. Shiller. "The dividend-price ratio and expectations of future dividends and discount factors." *The Review of Financial Studies* 1.3 (1988): 195-228.
- SHILLER, ROBERT J. "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?" *The American Economic Review* 71.3 (1981): 421-436.
- Lettau, Martin, and Sydney Ludvigson. "Consumption, aggregate wealth, and expected stock returns." *the Journal of Finance* 56.3 (2001): 815-849.
- Welch, Ivo, and Amit Goyal. "A comprehensive look at the empirical performance of equity premium prediction." *The Review of Financial Studies* 21.4 (2008): 1455-1508.
- Van Binsbergen, Jules H., and Ralph SJ Koijen. "Predictive regressions: A present-value approach." *The Journal of Finance* 65.4 (2010): 1439-1471.

### Consumption-based models

- Campbell, John Y., and John H. Cochrane. "By force of habit: A consumption-based explanation of aggregate stock market behavior." *Journal of political Economy* 107.2 (1999): 205-251.
- Bansal, Ravi, and Amir Yaron. "Risks for the long run: A potential resolution of asset pricing puzzles." *The journal of Finance* 59.4 (2004): 1481-1509.
- Barro, Robert J. "Rare disasters and asset markets in the twentieth century." *The Quarterly Journal of Economics* 121.3 (2006): 823-866.
- Wachter, Jessica A. "Can time-varying risk of rare disasters explain aggregate stock market volatility?" *The Journal of Finance* 68.3 (2013): 987-1035.

### Bond and currency markets

- Campbell, John Y., and Robert J. Shiller. "Yield spreads and interest rate movements: A

bird's eye view." *The Review of Economic Studies* 58.3 (1991): 495-514.

- Cochrane, John H., and Monika Piazzesi. "Bond risk premia." *American economic review* 95.1 (2005): 138-160.
- Vasicek, Oldrich. "An equilibrium characterization of the term structure." *Journal of financial economics* 5.2 (1977): 177-188.
- Cox, John C., Jonathan E. Ingersoll Jr, and Stephen A. Ross. "An intertemporal general equilibrium model of asset prices." *Econometrica: Journal of the Econometric Society* (1985): 363-384.
- Wachter, Jessica A. "A consumption-based model of the term structure of interest rates." *Journal of Financial economics* 79.2 (2006): 365-399.
- Bansal, Ravi, and Ivan Shaliastovich. "A long-run risks explanation of predictability puzzles in bond and currency markets." *The Review of Financial Studies* 26.1 (2013): 1-33.
- Verdelhan, Adrien. "A habit-based explanation of the exchange rate risk premium." *The Journal of Finance* 65.1 (2010): 123-146.
- Colacito, Riccardo, and Mariano M. Croce. "Risks for the long run and the real exchange rate." *Journal of Political economy* 119.1 (2011): 153-181.
- Lustig, Hanno, Nikolai Roussanov, and Adrien Verdelhan. "Common risk factors in currency markets." *The Review of Financial Studies* 24.11 (2011): 3731-3777.

Volatility and options (I omitted option pricing papers as those papers pretty much all rely heavily on continuous-time modelling. If you're interested, reach out to me.)

- Dew-Becker, Ian, et al. "The price of variance risk." *Journal of Financial Economics* 123.2 (2017): 225-250.
- Bollerslev, Tim, George Tauchen, and Hao Zhou. "Expected stock returns and variance risk premia." *The Review of Financial Studies* 22.11 (2009): 4463-4492.
- Drechsler, Itamar, and Amir Yaron. "What's vol got to do with it." *The Review of Financial Studies* 24.1 (2011): 1-45.
- Ang, Andrew, et al. "The cross-section of volatility and expected returns." *The journal of finance* 61.1 (2006): 259-299.
- Black, Fischer, and Myron Scholes. "The pricing of options and corporate liabilities." *Journal of political economy* 81.3 (1973): 637-654.
- Moreira, Alan, and Tyler Muir. "Volatility-managed portfolios." *The Journal of Finance* 72.4 (2017): 1611-1644.

Testing linear factor models: Econometrics

- Petersen, Mitchell A. "Estimating standard errors in finance panel data sets: Comparing approaches." *The Review of financial studies* 22.1 (2008): 435-480.

### Cross-sectional anomalies and production-based asset pricing

- Fama, Eugene F., and Kenneth R. French. "The cross-section of expected stock returns." *the Journal of Finance* 47.2 (1992): 427-465.
- Fama, Eugene F., and Kenneth R. French. "Common risk factors in the returns on stocks and bonds." *Journal of financial economics* 33.1 (1993): 3-56.
- Jegadeesh, Narasimhan, and Sheridan Titman. "Returns to buying winners and selling losers: Implications for stock market efficiency." *The Journal of finance* 48.1 (1993): 65-91.
- De Bondt, Werner FM, and Richard Thaler. "Does the stock market overreact?" *The Journal of finance* 40.3 (1985): 793-805.
- Fama, Eugene F., and Kenneth R. French. "Multifactor explanations of asset pricing anomalies." *The journal of finance* 51.1 (1996): 55-84.
- Carhart, Mark M. "On persistence in mutual fund performance." *The Journal of finance* 52.1 (1997): 57-82.
- Pástor, Luboš, and Robert F. Stambaugh. "Liquidity risk and expected stock returns." *Journal of Political economy* 111.3 (2003): 642-685.
- Ang, Andrew, et al. "High idiosyncratic volatility and low returns: International and further US evidence." *Journal of Financial Economics* 91.1 (2009): 1-23.
- Stambaugh, Robert F., Jianfeng Yu, and Yu Yuan. "Arbitrage asymmetry and the idiosyncratic volatility puzzle." *The Journal of Finance* 70.5 (2015): 1903-1948.
- Fama, Eugene F., and Kenneth R. French. "A five-factor asset pricing model." *Journal of financial economics* 116.1 (2015): 1-22.
- Hou, Kewei, Chen Xue, and Lu Zhang. "Digesting anomalies: An investment approach." *The Review of Financial Studies* 28.3 (2015): 650-705.
- McLean, R. David, and Jeffrey Pontiff. "Does academic research destroy stock return predictability?" *The Journal of Finance* 71.1 (2016): 5-32.
- Zhang, Lu. "The value premium." *The Journal of Finance* 60.1 (2005): 67-103.
- Adrian, Tobias, Erkki Etula, and Tyler Muir. "Financial intermediaries and the cross-section of asset returns." *The Journal of Finance* 69.6 (2014): 2557-2596.
- He, Zhiguo, Bryan Kelly, and Asaf Manela. "Intermediary asset pricing: New evidence from many asset classes." *Journal of Financial Economics* 126.1 (2017): 1-35.

### Testing conditional asset pricing models

- Jagannathan, Ravi, and Zhenyu Wang. "The conditional CAPM and the cross-section of expected returns." *The Journal of finance* 51.1 (1996): 3-53.
- Lettau, Martin, and Sydney Ludvigson. "Resurrecting the (C) CAPM: A cross-sectional test when risk premia are time-varying." *Journal of political economy* 109.6 (2001): 1238-1287.

- Lewellen, Jonathan, and Stefan Nagel. "The conditional CAPM does not explain asset-pricing anomalies." *Journal of financial economics* 82.2 (2006): 289-314.