FIN2020: Foundation of Finance
Spring 2022

Instructor

Dr. Wen Chen
Email: wenchen@cuhk.edu.cn
Office Hours: Before Chinese New Year, Zoom meeting on Wed. 8:30am-9:30am Beijing Time, or Induvial zoom meeting by appointment; After Chinese New Year, tbd

Venue:
Before Chinese New Year: Zoom virtual class
Two Sessions: Tue. Thu. 8:30am-9:50am, 10:30am-11:50am Beijing Time
The recordings of the sessions will be posted before 1pm every Tue and Thu
Zoom link:
https://cuhk-edu-cn.zoom.us/j/2316752884?pwd=ZTYrVlNmNitrYVNGcWI4dTZIUWlmUT09
Meeting ID: 231 675 2884
Passcode: 178759
After Chinese New Year: In person at ZHIX 109
Three Sessions: Tue. Thu. 8:30am-9:50am, 10:30am-11:50am, 3:30pm-4:50pm Beijing

Teaching Assistants:

Jiahua Gong
Email: gongjiahua@cuhk.edu.cn
Office hours: tbd

Yizhou Hong
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Office hours: tbd

Course Description

Foundation of Finance is an introduction to the foundations of modern financial economics. The focus throughout will be on the development and interpretation of discrete-time models of asset pricing, and the valuation of risky cash flow. After developing and studying the details of consumer decision-making under uncertainty, it uses that general framework as a basis for understanding both equilibrium and no-arbitrage theories of securities pricing, including traditional models like the capital asset pricing model (CAPM) and the arbitrage pricing theory (APT), newer Arrow-Debreu theories, and the consumption capital asset pricing model (CCAPM) and, if time permits, martingale pricing methods. The course is primarily theoretical. However, I may discuss some empirical puzzles in finance.

This course is intended for second year undergraduate students in finance and economics. While there are no formal prerequisites for enrolling in this course, a working knowledge of calculus, linear algebra, and probability plus statistics is especially useful.

The course grade will be based on the following: one midterm exam (30%); and a final exam (40%). The midterm and final are in-class close-book exams. The midterm will be in late March or early April. The final will be in the third week of May. There is NO option to transfer the midterm weight to final weight, except for medical or family emergency (see Policy on Absence below). The material covered in each exam is up to what we've learned by the time the exam is conducted. The last 30% of the grade is based on grades of homework.

Homework will be assigned almost every week and will be due one week after the assignment. Teaching assistants will go through the solution in the tutorial one week after it is assigned. Students are encouraged to discuss the homework problems with other students, but should work through all of the mathematics individually. Please submit homework to Blackboard on time. NO score for homework tuned in after the deadline. If you miss class on a day when a problem set is due, please scan your answers and email them to TAs before the deadline.

The main textbooks corresponding to the suggested reading are given below. The textbooks are NOT required. Some people find the textbooks helpful and some people do not. Read the description below before you decide on whether you feel it would be worth it for you to buy the textbooks:

(1) *Intermediate Financial Theory* by Jean-Pierre Danthine and John B. Donaldson, 2014 (Undergrad Level or above)
(2) *Asset Pricing* by John H. Cochrane, 2005 (Master Level or above)
(3) *Asset Pricing and Portfolio Choice Theory* by Kerry Back, 2010 (PhD Level)

Additional textbooks are also helpful: *Theory of Financial Decision Making* by J. Ingersoll, 1987, and *Foundations for financial economics* by C. F. Huang and R. H. Litzenberger, 1988. I will refer to these texts as (1) DD, (2) JC, (3) KB, JI, and HL, respectively.

Below is a list of topics to be covered. I reserve the right to change the syllabus (modestly) as the course progresses. Under each topic I summarize relevant reading and provide a number of classic references. Students are required to read the textbook readings marked with *. Students who plan to apply for graduate programs in finance and economics are encouraged to read the book materials without *. The topics without * will not be included in the exams. Students who are serious about research and plan to apply PhD programs should also read some additional articles without *. I will generally provide lecture slides or notes summarizing key points made in class.

Course Materials

I will post lecture slides, some class readings, and homework assignments on https://bb.cuhk.edu.cn. The lecture slides are based on Prof. Peter Ireland's lecture notes. Thus, the copyright of the slides belongs to Peter Ireland. Redistribution is permitted for education and research purpose, so long as no charges are made. All copies must be provided free of charge and must include the copyright notice.

Staying Up-to-Date

You are encouraged to follow financial and macroeconomic news in the Financial Times, Wall Street Journal, The Economist, or VoxChina. If you encounter an interesting article that you would like to share with the class, send me an email and I will post it on the class website.

Honor Code

All students are expected to adhere to the University's *Code of Academic Integrity*, which is designed to ensure that the principles of academic honesty and integrity are upheld. The Smith School does not tolerate academic dishonesty. All acts of academic dishonesty will be dealt with in accordance with the provisions of this code. Please visit the following website for more information on the University's Code of Academic Integrity: http://www.cuhk.edu.cn/departsite/ar/en/Academic.html

Policies on Absence and Late Withdrawal

Absences from class because of illness or important schedule conflicts are sometimes inevitable and should be fine so long as they are isolated in number. If you can't make it to class on any given day, you can check the course webpage to see the slides you missed.

Students who cannot take their midterm exams as scheduled because of documented serious illness, or compelling unexpected circumstances may appeal for weight transferring to final exams. Students who cannot take their final exams as scheduled because of documented serious illness, or compelling unexpected circumstances may appeal for make-up final exam. The following are examples that are not considered compelling reasons to grant a weight transferring or a make-up exam: lack of preparation, negligence, misinformation, or planned vacations and other events.

Please submit late withdrawal application before the midterm. Late withdrawals can only be granted before the midterm. After midterm, no late withdrawal will be proved.

Special Needs

Any student with special needs should bring this to the attention of the instructor as soon as possible, but not later than the second week of class.

Course Outline

A. Introduction (1.5 weeks)

1. Mathematical and Economic Foundation
2. Overview of Asset Pricing Theory

Readings:

- *DD chapter 1,2
- KB chapter 1.
- Machina, Mark, 1982, `Expected utility analysis without the independent axiom.' Econometrica 50, 277-323.
- Machina, Mark, `Choice under Uncertainty: Problems Solved and Unsolved' Journal of Economic Perspectives, vol. 1, no. 1, Summer 1987, pp. 121-54
- Rabin, Matthew, `Risk Aversion and Expected-Utility Theory: A Calibration Theorem' Econometrica, vol. 68, no. 5, September 2000, pp. 1281-92.

Spring Break: Happy Chinese New Year!

B. Decision-Making Under Uncertainty (2.5 weeks)

3. Making Choices in Risky Situations
4. Measuring Risk and Risk Aversion

Readings:

- *DD chapter 3,4
- J. Pratt, 1964, `Risk aversion in the small and in the large.' Econometrica 32, 122-136.
- HL Chapter 2
- Ali, Mukhatar, `Stochastic Dominance and Portfolio Analysis', Journal of Financial Economics, 1975, Vol. 2, pp. 205-229.
- Rothschild, Michael, and Joseph Stiglitz, `Increasing Risk I: A Definition', Journal of Economic Theory, 1970, Vol 2, pp. 225-43.
- Levy, Haim, `The Definition of Risk: An Extension,' Journal of Economic Theory, 1977, Vol. 14, 232-34.

C. The Demand for Financial Assets (2.5 weeks)

5. Risk Aversion and Investment Decisions
6. Modern Portfolio Theory

Readings:

- *DD chapter 5,6
- JI chapter 2.
- New Palgrave, Finance, `Arbitrage?', Macmillan Press, New York, 1987, pp. 57-71.

- Ross, Stephen, 1978, `A Simple Approach to the Valuation of Risky Streams? Journal of Business, 50, 453-75.
- Dybvig, Philip H; Ross, Stephen A, `Portfolio Efficient Sets?, Econometrica, vol. 50, no. 6, November 1982, pp. 1525-46
- Fishburn, Peter, Burr Porter, `Optimal Portfolios with One Safe and One Risky Asset: Effects of Change in the Rate of Return and Risk?, Management Science, 1976, Vol 22, p. 1064-73.
- Samuelson, Paul A., `General Proof that Diversification Pays?, Journal of Financial and Quantitative Analysis, 1967, vol. 2, pp. 1-13.

D. Classic Asset Pricing Models (3 weeks)

7. The Capital Asset Pricing Model
8. Arbitrage Pricing Theory

Readings:

- *DD chapter 8,14
- KB Chapter 5,6
- Merton, R., 1972, `An analytical derivation of the efficient portfolio frontier.' Journal of Financial and Quantitative Analysis,7, 1851-1872.
- G. Chamberlain, 1982, `A characterization of the distributions that imply mean-variance Utility functions.' Journal of Economic Theory 29, 185-201.
- Markowitz, Harry, "Portfolio Selection," *Journal of Finance* 7:77-91, 1952.
- Ross, S., "Mutual Fund Separation in Financial Theory—the Separating Distributions," *Journal of Economic Theory*, 17:254-286, 1978.
- W. Sharpe, 1964, `Capital asset prices: A theory of capital market equilibrium under conditions of risk.' Journal of Finance 19, 425-442.
- JI chapter 7.
- Huberman, Gur, "A Simple Approach to Arbitrage Pricing Theory," *Journal of Economic Theory* 28:183-191, 1982.
- Chamberlain, Gary, "Funds, Factors, and Diversification in Arbitrage Pricing Models," *Econometrica* 51:1281-1304, 1983.
- S. Ross, 1976, `Arbitrage theory of capital asset pricing.' Journal of Economic Theory 13, 341-360.

Midterm in late March or early April

E. Arrow-Debreu Pricing (2.5 weeks)

9. Arrow-Debreu Pricing: Equilibrium
10. Arrow-Debreu Pricing: No-Arbitrage

Readings:

- *DD Chapter 9,11
- KB Chapter 2,3

- Hirshleifer, J., `Investment decisions under uncertainty: Application of state-preference Approach.' Quarterly Journal of Economics, May 1966, 252-277.
- Myers, S., 1968, `A time-state preference model of security valuation.' Journal of Financial and Quantitative Analysis, 1-33.
- Case, D., and J. Stiglitz, 1970, `The structure of investor preferences and asset returns, and separability in portfolio allocation: A contribution to the pure theory of mutual funds.' Journal of Economic Theory 2, 122-160.

F. Extensions (2.5 weeks)

11. Martingale Pricing
12. The Consumption Capital Asset Pricing Model

Readings:

- *DD Chapter 10,12
- KB Chapter 4
- J. Lucas, Robert E. *Asset pricing in an exchange economy.* Econometrica, 46(6): 1429-1445, 1978.
- Rubinstein, M., 1976, `The valuation of uncertain income streams and the pricing of options., Bell Journal of Economics 7, 407-425.
- Black, F. and M. Scholes, *The pricing of options and corporate liabilities.* Journal of Political Economy, 81(3): 637-654, 1973.
- S. Ross, 1976, `Options and efficiency.' Quarterly Journal of Economics 90, 75-89.

Final: one day in the week of May 15-20, 2021

This schedule is tentative. Readings might be revised as we go through the material.