University of Bern   Spring 2024
Institute for Financial Management

Syllabus

Investments

Core Module Asset Pricing (Master)

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Schedule

Class meets:

- Thursday, 10:15 – 13:00 (22.02.2024 to 30.05.2024)

- Room: Seminarraum 107, Engehalde E8

Exam

Final Exam: 10.06.2024, 09:45 – 11:45, Engehalde room 002
Retake: 12.09.2024, 10:45 – 12:45, HG 106

Assigment

Available on ILIAS: 28.03.2024
Due date: 23.05.2023

Graduate Assistants

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Focus

Portfolio analysis is a cornerstone of modern finance theory, which brought, along with the pricing of derivative securties, the two main methological revolutions of the field. The work of Harry Markowitz on mean-variance analysis paved the way to the most important asset-pricing models, let alone the CAPM. The CAPM, introduced by Jack Treynor, William Sharpe, John Lintner, and Jan Mossin in the sixties, remains to this day the model that firms and investors most widely use.

Despite its wide practical use, the CAPM has been subject to theoretical criticism (e.g., Richard Roll (1972), or Lars Hansen and Scott Richard (1987)), and has met with little empirical success at explaining the cross section of stocks. An important caveat is that the CAPM ignores intertemporal reasoning, which would only be a good approximation in a world in which information does not matter. A relevant question is whether information moves asset prices sufficiently to explain the empirical performance of the CAPM. Answering this question will naturally lead us to an intertemporal version of the CAPM, that was first introduced by Robert Merton.

The class follows the chronological order of discoveries. With investing in the stock market as our main focus, we will first present the mean-variance framework pioneered by Harry Markowitz. In this context, we will then show how the CAPM arises in equilibrium. We will discuss extensively the empirical and theoretical shortcomings of the CAPM, which will open up the second part of the class—intertemporal portfolio optimization. We will introduce mathematical tools of dynamic programming and conclude by constructing and discussing the intertemporal version of the CAPM.

Prerequisites

Knowledge of economics, capital markets, statistics, matrix algebra, and constrained optimization. Portfolio analysis is necessarily an analytical subject; it requires notions of probability theory, matrix algebra, and calculus. I will assume that you know basic economic concepts, such as that of a utility function, risk aversion, market clearing, or shadow prices. I view this class as complementing the portfolio optimization class by focussing on economic insights based on analytical expressions.

Organization of the Course

Course Structure

The course is structured in a traditional lecture format, with weekly lectures based on a set of lecture notes, a graded assignment, and a final exam (no midterm exam). The assignment can be submitted in groups of **at most** 4 students (I will provide further details about the assignment during the first class). All material is available on Ilias. I will also upload some exercises with solutions to ILIAS for you to practice the topics discussed in class. The exercises are not graded and need not be handed in.

Course Materials

Relevant textbooks for the course (Optional)

- Jean-Pierre Danthine and John Donaldson, *Intermediate Financial Theory*, Elsevier, Academic Press, third edition, 2014. This book is an advanced undergraduate reference, which is useful for background material.

- John Campbell, *Financial Decisions and Markets: A Course in Asset Pricing*, Princeton University Press, 2018. This book just came out and is written by one of the leading scholars in asset pricing. Technically, this book is closer to the derivations we will do in class, but a lot of the material largely overshoots what we will do.

- Kerry Back, *Asset Pricing and Portfolio Choice Theory*, Oxford University Press, Second Edition, 2017. This book is another nice reference, similar to John Cochrane's book, but focused exclusively on theory. Here again the material goes substantially beyond what I intend to cover in this class.

Grading

60% final exam, 40% assignment

Course Outline

The following is a tentative agenda for this class:

Section 1:	Mean-Variance Analysis
Section 2:	The Capital Asset Pricing Model
Section 3:	Empirical and Theoretical Criticisms
Section 4:	Intertemporal Portfolio Problem
Section 5:	The Intertemporal CAPM

In particular, the tentative list of topics for each class is:

Section 1

- The Static Portfolio Problem, (Danthine-Donaldson, Chapters 4, 5, 6/Campbell Chapters 1, 2/Back, Chapters 1, 2, 5)

Section 2

- The Capital Asset Pricing Model, (Danthine-Donaldson, Chapter 7/Campbell Chapters 3.1/Back, Chapters 6.1)

Section 3

- Theoretical and Empirical Criticisms (Campbell, Chapter 3; many references in the slides)

Section 4

- The Intertemporal Portfolio Optimization (Danthine-Donaldson, Chapter 14/Campbell, Chapter 9/Back, Chapter 9)

Section 5

- The Intertemporal CAPM (Campbell, Chapter 9.3/Back, Chapter 10)