

Syllabus

Doctoral Seminar in Empirical Finance

Norges Handelshøyskole

Lecturer: Lars A. Løchstøer¹

Fall, 2008

Course Outline

i. Course Description

Students in this class will learn

1. Facts: What are some key facts about the behavior of asset prices?
2. Methodology: How have researchers tested various theoretical models from finance? What are the pitfalls of these research designs?
3. Methodology: What kinds of papers have impact? What kinds do not?
4. Practical econometric tools: How do we actually use GMM, ML, and other methods?

The learning process involves

1. Reading and discussing many papers. Some of these papers are classics in the field; some are very new, but with the potential to become classics; some are flawed or misguided; and a few are works-in-progress, to illustrate the process of writing an empirical paper.
2. Solving problem sets. The problem sets require students to implement various econometric techniques as computer exercises. If all goes well, they will also allow the students to explore some issues in finance that are not discussed in depth in the papers we will read.

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The syllabus is fairly dense, and we may not have time to cover all the topics and papers. I will notify you (in class) of any changes as we go along.

ii. Class Schedule

| Date | Time | Room |
|----------------|---------------|------------|
| August 14 - 15 | 12:30 - 17:30 | Aud 24 |
| August 18 - 20 | 12:30 - 16:30 | Karl Borch |
| August 21 | 12:30 - 16:30 | Aud 11 |
| August 22 | 12:30 - 16:30 | Aud 24 |

1 Readings and Reference Materials

The following textbook is required:

- John H. Cochrane, **Asset Pricing**, Princeton University Press, Princeton, 2004. I will refer to this text as **AP** throughout the syllabus.

The following books are useful additional references:

- John Y. Campbell, Andrew W. Lo and A. Craig MacKinlay, *The Econometrics of Financial Markets*, Princeton University Press, Princeton, 1997.
- William Greene, *Econometric Analysis* (5th ed.), MacMillan, New York, 2003.
- James Hamilton, *Time Series Analysis*, Princeton University Press, Princeton, 1994.

2 Course Requirements

The course grades will be based on:

Class Participation (15%)

The class participation grade is based on your discussion of the papers that we will cover. I expect you to come prepared, having read the assigned readings for each class. Given the large amount of reading material, you should start reading papers ahead of the first class.

Problem Sets (25%)

I will distribute one very long problem set in the last lecture. Your answers will be due by noon October 6th.

Final Exam (60%)

There will be a 5 hour open book exam. We will agree on a suitable date in class, likely in late October, early November.

3 Programming and Data

Most people do not acquire a deep understanding of empirical issues without actually doing empirical work. Therefore you will be assigned exercises that require dealing with data and estimating models. You are free to use any software available to you to perform this empirical work. Matlab, Stata, and Eviews are recommended.

4 Tentative Course Outline

We may deviate from this reading list. Such deviations will be announced in class.

4.1 The CAPM and an econometric review

a. Methodology: CAPM, OLS, and tests of the CAPM

- Any source to review CAPM theory. In **AP**, it is Ch. 9, but this chapter depends on Chapters 4, 5, and 6 as well.
- Time-series tests: Gibbons, Ross and Shanken (1989). **AP** Ch. 12.
- Cross-sectional tests: **AP** pp. 434 - 452.
- *Other references*: Shanken (1987), Shanken (1992), Black, Jensen, and Scholes (1972), Fama and MacBeth (1973)

b. Early evidence on the CAPM: Fama and French (1992)

- Fama and French (1992)

c. Methodology: review of asymptotics for OLS

- Any graduate-level econometrics textbook (e.g., Greene, referenced above).

4.2 Multifactor models I: Methodology, and standard linear K-factor models

a. The Fama-French Model and critiques

- Fama and French (1993)
- **AP** Ch. 9
- MacKinlay (1995)
- Lo and MacKinlay (1990)
- Berk (1995)

b. General linear factor models

- **AP** Ch. 13
- Pastor and Stambaugh (2003)
- *Other references*: Chen, Roll, and Ross (1986)

c. Momentum

- Jegadeesh and Titman (1993)

4.3 Methodology: GMM tests of models with an observable stochastic discount factor

- Hansen and Singleton (1982)
- **AP** Ch. 10, 11
- *Other references*: Hansen, Heaton and Yaron (1996)

4.4 Time-series properties of returns I: Predictability

- **AP** Ch. 20.1
- Shiller (1981)
- Fama and French (1989)
- Campbell and Shiller (1988)
- Hodrick (1992)
- Lettau and Ludvigsson (2001a)

- Stambaugh (1999)
- Boudoukh, Michaely, Richardson, and Roberts (2007)
- *Other references:* Ang and Bekaert (2006).

4.5 Beyond the (static) CAPM

a. Conditional linear factor models

- AP Ch. 8.
- Lettau and Ludvigsson (2001b)
- Lewellen and Nagel (2006)
- *Other references:* Jagannathan and Wang (1996), Ferson and Harvey (1999), Petkova and Zhang (2005)

b. Value, growth, and duration

- Campbell (1991)
- Campbell and Mei (1993)
- Dechow, Sloan, and Soliman (2004)
- Campbell and Vuolteenaho (2004)
- *Other references:* Campbell (1993), Cohen, Polk, and Vuolteenaho (2003), Cohen, Polk, and Vuolteenaho (2006), Lettau and Wachter (2007)

4.6 Consumption-based asset pricing with a representative agent

- AP Ch. 21
- Campbell (2003) - Excellent summary article
- Parker and Julliard (2005)
- Bansal and Yaron (2004)
- Yogo (2006)
- Piazzesi, Schneider, and Tuzel (2007)
- *Other references:* Working (1960), Mehra and Prescott (1985), Campbell and Cochrane (1999), Bansal, Kiku and Yaron (2007).

4.7 Investor heterogeneity

- Brav, Constantinides, and Geczy (2002)
- Vissing-Jorgensen (2002)
- *Other references:* Constantinides and Duffie (1996), Guvenen (2005).

4.8 Geometric evaluations of asset pricing models

Required reading (although you do not need to follow in detail all of the math of the Hansen papers, especially when nonnegativity is imposed). The Jagannathan and Wang paper was suggested reading earlier in the semester. Here it is included because it develops an estimation methodology for the HJ-distance.

- Hansen and Jagannathan (1991)
- Hansen and Jagannathan (1997)
- AP The material on H-J bounds in Chapter 5, and Chapters 13 - 16 (they are short chapters)
- Jagannathan and Wang (1996)

We will also briefly discuss

- Hodrick and Zhang (2001)

We will not discuss this related paper. It works out the econometrics of the HJ-distance when the null is that the econometrician has the wrong stochastic discount factor.

- Hansen, Heaton, and Luttmer (1995)

4.9 What is total wealth and does it matter?

- Heaton and Lucas (2000)
- Moskowitz and Vissing-Jorgensen (2002)
- Campbell (1996)

4.10 Explaining asset price innovations

We will only briefly discuss these papers:

- Roll (1984)
- Kothari and Shanken (1992)
- Boudoukh, Richardson, Shen and Whitelaw (2007); follow-up to Roll (1984)

4.11 Stock return volatility

We will only briefly discuss these papers:

- Schwert (1989)
- French and Roll (1986)
- Campbell, Lettau, Malkiel, and Xu (2001)

A follow-up to French and Roll's paper is:

- Barclay, Litzenberger, and Warner (1990)

4.12 The term structure

Motivation and some facts

- AP, Chapter 19
- Litterman and Scheinkman (1991)
- Campbell and Shiller (1991)
- Cochrane and Piazzesi (2006)

Formal modeling

A good background source on this topic is

- Piazzesi (2003)

We will discuss some features of the following papers

- Dai and Singleton (2000)
- Duffee (2002)
- Ang and Piazzesi (2003)
- *Other references:* Ang, Dong, and Piazzesi (2004), Duffee (2006), Bibkov and Chernov (2006).

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