GSF Empirical Asset Pricing 2025-2026 Syllabus

Course teachers:

- Matthijs Lof, Aalto University, matthijs.lof@aalto.fi (Weeks 1-3)
- Petri Jylhä, Aalto University, petri.jylha@aalto.fi (Weeks 4-6)

The course covers a range of topics in modern empirical asset pricing, including empirical methods used in asset pricing, the introduction of established empirical (cross-sectional and time-series) patterns in asset prices, and a discussion of unresolved puzzles within the field.

Upon completing the course, students will have developed the skills necessary to critically asses empirical asset pricing research (including seminar presentations and research papers), and to start conducting independent empirical research in asset pricing.

Prerequisites

Students are expected to be familiar with asset pricing theory, in particular with the Capital Asset Pricing Model (CAPM), and Arbitrage Pricing Theory (APT). Ideally, students have completed the GSF course Theoretical Asset Pricing prior to starting this course.

Students are expected to be familiar with (at least) undergraduate level econometrics. Good textbooks to brush up econometrics: Verbeek - "A guide to Modern Econometrics" or Hayashi - "Econometrics"

Students will need to use a programming language or econometrics software package for empirical analysis. While we will provide some examples in R, students are free to use any tool they prefer. Common choices include R (via RStudio), STATA, MATLAB, SAS, and Python. Point-and-click software like EViews or SPSS is generally not recommended for research purposes due to limited scripting capabilities.

Course practicalities

We will assign five weekly empirical exercises. Solutions to the exercises need to be submitted through MyCourses and will be graded with a maximum of one point each (5 points in total). We expect students to allocate serious time and effort to solving the exercises. This is the best way to learn and to prepare for the exam and term paper. Full exercise points will be allocated if sufficient effort is demonstrated, even if the solution is not correct.

The course grade comprises three parts (a written closed-book exam, a term paper, and exercises). The total points of the course are 100. To pass the course, one needs at least 50 points. In addition, one must get at least 50% of the points from the exam and 50% of the points from the term paper.

- Written exam (max 80 points)
- Term paper (max 15 points)
- Weekly exercises (max 5 points)

Submission deadline for the term paper: **January 31, 2026**. Please submit the term paper through MyCourses. Instructions for the term paper will be provided during the course.

Week 1: Econometrics recap (ML)

- Linear regression model
- Least Squares, Maximum Likelihood, Method of Moments
- Hypothesis testing
- Standard errors: White, HAC, Newey-West, clustering

Key references

Any PhD level econometrics textbook (e.g. Verbeek, Hayashi, Greene, Hansen, Davidson and MacKinnon).

Wooldridge, J. M. (2023). What is a standard error?(And how should we compute it?). Journal of Econometrics, 237(2), 105517.

Week 2: Market return predictability (ML)

- Variance decomposition: cash flows vs. discount rates
- Equity premium predictability

Key references

Cochrane, J. H. (2011). Presidential address: Discount rates. The Journal of Finance, 66(4), 1047-1108.

Campbell, J. Y., and Shiller, R. J. (1988). The dividend-price ratio and expectations of future dividends and discount factors. The review of financial studies, 1(3), 195-228.

Cochrane, J. H. (2008). The dog that did not bark: A defense of return predictability. The Review of Financial Studies, 21(4), 1533-1575.

Welch, I., and Goyal, A. (2008). A comprehensive look at the empirical performance of equity premium prediction. The Review of Financial Studies, 21(4), 1455-1508.

Week 3: Testing the CAPM (ML)

- Testable hypotheses implied by CAPM
- Time-series regressions, Gibbons-Ross-Shanken (GRS) test
- Cross-sectional regressions
- Fama-MacBeth regressions

Key references

Any of the following textbooks covering statistical testing of the CAPM:

- Cochrane, J. (2009). Asset pricing. Princeton university press. Chapter 12.
- Campbell, J. Y. (2017). Financial decisions and markets: a course in asset pricing. Princeton University Press. Chapter 3.
- Campbell, J. Y., Lo, A.W., and MacKinlay, A.C. (1997). The econometrics of financial markets. Princeton University Press. Chapter 5.

Gibbons, M. R., Ross, S. A., and Shanken, J. (1989). A test of the efficiency of a given portfolio. Econometrica: Journal of the Econometric Society, 1121-1152.

Fama, E. F., and MacBeth, J. D. (1973). Risk, return, and equilibrium: Empirical tests. Journal of political economy, 81(3), 607-636.

Week 4: Cross-section of expected stock returns (PJ)

- Cross-sectional return predictors
- Factor models
- Factor zoo

Key references

Fama, E. F., and French, K. R. (1992). The cross-section of expected stock returns. Journal of Finance, 47(2), 427-465.

Fama, E. F., and French, K. R. (1993). Common risk factors in the returns on stocks and bonds. Journal of financial economics, 33(1), 3-56.

Fama, E. F., and French, K. R. (2015). A five-factor asset pricing model. Journal of financial economics, 116(1), 1-22.

Jegadeesh, N., and Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. The Journal of finance, 48(1), 65-91.

Week 5: Approaches to asset pricing (PJ)

- Intermediary asset pricing
- Production based asset pricing
- Demand system asset pricing

Key references

Adrian, T., Etula, E., and Muir, T. (2014). Financial intermediaries and the cross-section of asset returns. The Journal of Finance, 69(6), 2557-2596.

Hou, K., Xue, C., and Zhang, L. (2015). Digesting anomalies: An investment approach. The Review of Financial Studies, 28(3), 650-705.

Koijen, R. S., and Yogo, M. (2019). A demand system approach to asset pricing. Journal of Political Economy, 127(4), 1475-1515.

Week 6: Beyond equities (PJ)

- Term structure of interest rates
- Currencies
- Corporate bonds
- Mutual funds

Key references

Cochrane, J. H., and Piazzesi, M. (2005). Bond risk premia. American economic review, 95(1), 138-160.

Fama, E. F. (1984). Forward and spot exchange rates. Journal of monetary economics, 14(3), 319-338.

Lustig, H., Roussanov, N., and Verdelhan, A. (2011). Common risk factors in currency markets. The Review of Financial Studies, 24(11), 3731-3777.