



Econometrics III: Time Series Analysis

Course Description:

This course focuses on the advanced methods and tools to analyze time series in finance and macroeconomics. We will apply these methods and tools to study various macro-finance models. The students are expected to understand and solve problems in estimating and testing different models in finance and macroeconomics.

The prerequisite for this course is intermediate-level courses in finance and macroeconomics and econometrics (for example, Econometrics Analysis by William Greene).

Time and Location:

Time: Week 2-Week 17, Fridays 12:55-15:40 pm

Location: Xin Shang Yuan S204

Office Hour:

- The most efficient way to contact me is by email, and I will usually reply in 24 hours. Office hour is available by appointment. My email address is nanli@sjtu.edu.cn My office is in Antai College of Economics and Management, B705.
- A wechat group will be set up on the first class
- Course Website: www.nanlifinance.org/teaching.html

Homework/Grading

There will be homework and final exam. You are also required to write a referee report and give a 30-minutes presentation of a research paper of your choice within the pool of required readings (part II). The final grade is based on the weighted average of the homework, presentation, referee report and final exam grades. The following weighting schemes will determine your final grade for the course:

Homework:	30%
Presentation and Referee Report:	20%
Class Participation:	10%
Final Exam:	40%

You are encourage to discuss homework in groups, but each one of you must hand in a copy of homework separately. For empirical parts of the homework, do NOT submit your program codes or raw data, please submit the final results of your computation with explanation. No late submission of homework will be accepted.

Class Presentation and Referee report:

Each student must sign up to do a 30-minute class presentation of a paper. You should hand out copies of your slides before the presentation. In addition a referee report for the paper you resented will be due by the end of the semester. The referee report should be no more than 10 pages with at least 11pt Time New Roman Font and 1.5 line spacing.



Warning:

- **Plagiarism is taken very seriously.** Students had been caught plagiarizing in class assignments, term paper, and/or quizzes in this course have been severely penalized. Any student caught cheating in any class assignments, term paper, and/or exams will be failed in this course and reported to the school for further penalty.
- If a student is absent from the exam or late for more than 30 minutes without any medical certificate or other verifiable excuses (subject to the approval of lecturer), there will be no make-up exam and the grade will be counted as zero.

Textbooks and References:

- **Require textbooks and manuscripts:**
 1. *Time Series Analysis*, by James Hamilton, Princeton University Press, 1994. (TSA)
 2. *Asset Pricing, Revised Edition*, by [John H. Cochrane](#), Princeton University Press, 2005. (AP)
 3. [*Time Series for Macroeconomics and Finance*](#), by John H. Cochrane, Lectures Notes for Ph.D. Students in Finance, The University of Chicago, 2005. (TSMF)
- **Recommended textbooks and manuscripts:**
 1. *The Econometrics of Financial Markets*, by John Campbell, A. Lo, and C. MacKinlay, Princeton University Press, 1997.
 2. *Econometric Analysis*, by William Greene, Macmillan Publishing Company, 1990.
 3. [Lectures in Quantitative Economics](#) by [Thomas J. Sargent](#) and [John Stachurski](#)
 4. [Financial Markets and the Real Economy](#), by John H. Cochrane (FMRE)
- For the tips on preparation of presentation and writing papers
 - Cochrane, J. (2005) [Writing tips for PhD students](#)
- Useful websites for data and programming
 - <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/>
 - <http://wrds.wharton.uppen.edu>
 - <http://www.bea.gov/beahome.html>
 - <http://www.federalreserve.gov/releases/>



Reading List and Class Schedule (tentative and subject to changes):

1. ARMA Models, Autocorrelation, Prediction and Impulse-Response Functions

- TSMF Chapter 1-5
- TSA Chapter 3-5
- Bloom, N. (2009), The Impact of Uncertainty Shocks. *Econometrica*, 77: 623-685.
- Bayer, C., Luetticke R., Pham-Dao L., Tjaden V. (2019), Precautionary Savings, Illiquid Assets, and the Aggregate Consequences of Shocks to Household Income Risk. *Econometrica*, 87: 255-290.

2. Wold representation, VAR and Kalman Filter

- TSMF Chapter 6-7
- TSA Chapter 11, 13, Appendix A
- Cochrane, John (1991), "Volatility Tests and Efficient Markets: A Review Essay", *Journal of Monetary Economics* 27, 463-485.
- Cochrane, John (1992), "Explaining the Variance of Price-Dividend Ratios", *Review of Financial Studies*, 5(2), 243-280
- Cochrane, John (2007), "The Dog that Did Not Bark: A Defense of Return Predictability", *Review of Financial Studies Advance*, Access September 2007
- Goyal, Amit and Ivo Welch (2008), "A Comprehensive Look at The Empirical Performance of Equity Premium Prediction", *Review of Financial Studies* 21(4) 1455-1508.

3. Spectral Analysis

- TSMF Chapter 8
- TSA Chapter 3, 6
- Lucas, R.E. and E. C. Prescott (1974), "Equilibrium Search and Unemployment," *Journal of Economic Theory*, 7(2), 188-209
- Kydland, F.E. and E.C. Prescott (1982), "Time to Build and Aggregate Fluctuations," *Econometrica*, 50(6), 1345-70.
- Cochrane, John (1989), "The Return of the Liquidity Effect: A Study of the Short Run Relation between Money Growth and Interest Rates" *Journal of Business and Economic Statistics* 7, 75-83.
- King, Robert G. and Mark W. Watson (1996), "Money, Prices, Interest Rates, and the Business Cycle" *Review of Economics and Statistics* 78:35-53.

4. Unit Root and Cointegration

- TSMF Chapter 10, 11
- TSA Chapter 17, 18, 19.
- Campbell, John Y. and P. Perron (1991), Pitfall and Opportunities: What Macroeconomists Should Know about Unit Roots, in O.J. Blanchard and S. Fisher (eds.), *NBER Macroeconomics Annual*, The MIT Press, 141-201.
- Campbell, John Y. and Robert J. Shiller (1987), "Cointegration and Tests of Present Value Models" *Journal of Political Economy* 95, 1062-1088.
- Campbell, John Y., and Robert J. Shiller (1988a), "The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors", *Review of Financial Studies* 1:195-228.
- Campbell J., and Shiller R. (1988b), "Stock Prices, Earnings and Expected Dividends," *Journal of Finance*, 43, 661-676.



- Campbell, J. and T. Vuolteenaho (2004), “Bad Beta, Good Beta”, *American Economic Review* 94, 1249-1275
- Cochrane, John (1988), How Big is the Random Walk in GNP? *Journal of Political Economy* 96 (October 1988) 893-920.
- Cochrane, John (1991a), Comments on Campbell and Perron, in O.J. Blanchard and S. Fisher (eds.), *NBER Macroeconomics Annual*, The MIT Press, 201-210.
- Cochrane, John (1991b), A Critique of The Application of Unit Root Tests *Journal of Economic Dynamics and Control* 15 (April 1991) 275-284.
- Cochrane, John (1994), Permanent and Transitory Components of GNP and Stock Prices” *Quarterly Journal of Economics* CIX (February 1994) 241-266.
- Engle, R. and C. W. J. Granger (1987), “Cointegration and Error Correction: Representations, Estimation and Testing,” *Econometrica*, 55, 252-76.
- Stock, J.H. and M.W. Watson (1988), “Testing for Common Trends,” *Journal of American Statistical Association*, 83, 1097-1107.
- L ópez-Salido, D., Stein, J. C., Zakrajšek, E., 2017. “Credit-market sentiment and the business cycle”. *Quarterly Journal of Economics*, 132, 1373–1426.

5. GMM

- TSMF Chapter 14
- AP Part II Chapter 10-16.
- Hansen, Lars P. (1982), “Large Sample Properties of Generalized Method of Moments Estimators”, *Econometrica*, Vol. 50, No. 4, 1029-1054.
- Hansen, Lars P. and Kenneth J. Singleton(1982), “Generalized Instrumental Variables Estimation of Nonlinear Rational Expectation Models”, *Econometrica*, Vol. 50, No. 5, 1269-1286.
- Petersen, Mitchell A., (2008) “Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches”, *Review of Financial Studies*, forthcoming.

6. Measuring Uncertainty and Long-Run Risk

- Hansen, Lars Peter and Thomas J. Sargent. 2001. "Robust Control and Model Uncertainty." *American Economic Review*, 91(2): 60-66.
- Bansal and Yaron (2004) , “Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles,” *Journal of Finance* 59, August 2004: 1481-1509
- Bansal, R. R. F. Dittmar and C. T. Lundblad (2005), “Consumption, Dividends, and the Cross Section of Equity Returns”, *Journal of Finance*, Vol. 60, No. 4, 1639-167
- Hansen, L.P., J. Heaton and N. Li (2008) “Consumption Strikes Back?: Measuring the Long-Run Risk”, *Journal of Political Economy*, vol 116, no.2, 260-302
- Barillas, Francisco, Lars Peter Hansen, Thomas J. Sargent (2009) “Doubts or variability?”, *Journal of Economic Theory*, 144, 2388-2418
- Ai, Hengjie (2010), “Information Quality and Long-Run Risk: Asset Pricing Implications”, *Journal of Finance*, Vol. 65, No. 4, 1333-1367.
- Jurado, K., S.C. Ludvigson, Ng S. 2015. Measuring uncertainty, *American Economic Review*, 105, 1177-1216
- Bali, Turan G., Stephen J. Brown, Yi Tang. 2017. Is economic uncertainty priced in the cross-section of stock returns?, *Journal of Financial Economics*, Vol. 126, no. 3, 471-489
- Brenner, Menachem, Yehuda Izhakian. 2018. Asset pricing and ambiguity: Empirical evidence, *Journal of Financial Economics*, Vol. 130, no. 3, 503-531



- Kang, Wenjin, Nan Li and Huiping Zhang, 2019. “Information Uncertainty and the Pricing of Liquidity.” *Journal of Empirical Finance*, forthcoming



A Brief Guide for Writing Your Report as a Referee

Your report should not normally exceed 10 pages of A4 paper. Since you read papers from the journals, you may wish to choose one of these as a starting point. In your report as a referee you should consider the following issues.

- 1) How important is the question addressed in your chosen paper?
- 2) How important/interesting are the results which have been obtained in this area? When assessing this, consider the importance of the paper for financial economists in general.
- 3) How well are the conclusions of the paper supported? In particular:
 - Are there any additional tests of the model/conclusions that should have, or could have reasonably been made to support the conclusions? (If it really is essential to make very extensive additions to the paper this is unlikely to be practical and therefore the paper would usually be rejected.)
 - Are the data/conclusions internally consistent and consistent with other reports in the literature? If not, is there a concern about the present data and have the authors discussed plausible reasons for the discrepancy?
 - Are the assumptions made likely to be valid? Should the authors perform additional checks?

You are free to decide on the format of a referee's report. However, there is often a first paragraph which summarizes the paper's conclusions, methods and significance (in the view of the referee). Often the strengths of the paper are highlighted here. This is then followed by a series of points detailing the possible concerns about the methods or conclusions. For the paper you cannot make some useful suggestions, you may want to present the results in the extended periods and see if there is any change in the results.