Economics 840: Time Series Econometrics

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Office hours: Tuesdays and Thursdays, 1:00-3:00pm.

Classes: Mondays and Wednesdays, 9:30-11:18am.

TA for this course: Jungick Lee (lee.2570@osu.edu).

Econ 840 is a course in time series econometrics. Prerequisite for this course is the first year Econometrics sequence.

The analysis of time series is fundamentally more complex than that of cross-sectional data. This is because in time series, observations at point $t$ in time will typically be heavily correlated with observations in period $t + 1$, $t + 2$, etc. Time series analysis seeks to model data that cannot be assumed to be independent at each point in time. In economics, time series are especially important for the analysis of macro-economic data and financial data.

A short description of the topics of this course is the following. A classical technique for the analysis of time series is the use ARMA or ARIMA models (AutoRegressive Moving Average) to model time series. Frequency domain techniques provide an alternative way of looking at time series by attempting to split a time series into processes of different frequencies. GARCH processes are important in financial applications; GARCH models seek to model the conditional variance of a stochastic process, rather than the level of the process. A lot of applied work in contemporary econometrics focuses on so-called unit roots. Unit root processes are no longer mean reverting, unlike stationary ARMA processes, and it appears that many economic time series (such as for example GNP) display unit root behavior. Spurious regression is the counterintuitive phenomenon that time series regressions can display significant t-values, in spite of the fact common sense tells us that both processes should be independent. Finally, if two time series have a unit root, but a linear combination of two such processes is stationary, i.e. does not possess a unit root, then these two time series are called cointegrated.

The textbook for this course is Hamilton, Time Series Analysis, Princeton University Press, 1994. In addition, we will be using lecture notes that were written by Ling Hu. A simple class webpage can be found at
There will be one in-class midterm for this course; in addition, there will be four take-home exercises that you will have to hand in. The final of this course is on Tuesday June 3, 9:30-11:18 am, in our regular classroom. The midterm for this course will be on Wednesday April 23.

The final for this course will count for 40% of your grade, and the midterm will count for 40%. The four exercises will count for 5% each.

**Course Topics**

1. ARMA and ARIMA models.
2. The frequency domain.
3. GARCH models.
4. Integrated processes.
5. Spurious regressions.
6. VAR processes and cointegration.
Legals disclaimers and other information

1. Disability statement

Students with disabilities that have been certified by the Office for Disabilities Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs.

2. Academic misconduct statement

ACADEMIC INTEGRITY (ACADEMIC MISCONDUCT)

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an “excuse” for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.
Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (oaa.osu.edu/coam/home.html)
- Ten Suggestions for Preserving Academic Integrity (oaa.osu.edu/coam/ten-suggestions.html)
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.html)