

2nd Year - Elective Course

Analysis of Financial Time Series (AFTS)

Ruey Tsay (University of Chicago GSB)

Email: ruey.tsay@gsb.uchicago.edu

Website: <http://faculty.chicagogsb.edu/ruey.tsay/index.htm>

Course Description:

This course focuses on the theory and applications of financial time series analysis, especially in volatility modeling and risk management. Students are expected to gain practical experience in analyzing asset return data. Real examples are used throughout the course. The topics discussed include the following:

1. Analysis of asset returns: autocorrelation, business cycles, stationarity, predictability and prediction. Simple linear models for returns and regression models with serially correlated errors.
2. Volatility models: GARCH-type models, GARCH-M models, EGARCH model, GJR model, stochastic volatility model, long-range dependence.
3. Volatility forecasts and realized volatility.
4. High-frequency data analysis (market microstructure): transactions data, nonsynchronous trading, bid-ask bounce, duration models, bivariate models for price changes and duration, and realized volatility.
5. Nonlinearities in financial data, simple nonlinear models, change in volatility, Markov switching and threshold models, and neural network.
6. Continuous-time models: simple continuous-time and diffusion models, Ito's lemma and Black-Scholes pricing formulas and jump diffusion models.
7. Value at Risk: Riskmetrics, quantile estimation, extreme value analysis, peaks over threshold, and value at risk based on extreme value theory.
8. Multivariate series: cross correlation matrices, vector AR(1) model, co-integration and threshold co-integration, factor models and multivariate volatility models.

Textbook:

Analysis of Financial Time Series, 2nd Ed. by Ruey Tsay, John Wiley, 2005

Time schedule:

Mon,	Oct 02,	09.00 - 12.00, WU
Tue,	Oct 03,	09.00 - 12.00, WU and 14.00 - 17.00, WU
Wed,	Oct 04,	09.00 - 12.00, WU and 14.00 - 17.00, WU
Thu,	Oct 05,	09.00 - 12.00, WU
Fri,	Oct 06,	09.00 -12.00, WU
Mon,	Oct 09,	09.00 -12.00, WU
Tue,	Oct 10,	09.00 -12.00, WU
Wed,	Oct 11,	09.00 -12.00, WU
Thu,	Oct 12,	09.00 -12.00, WU
Fri,	Oct 13,	09.00 -12.00, WU

Location:

WU, UZA 4, Nordbergstrasse 15, 1090 Wien

Examination:

Fri, Oct 27, 2006, 12.30-15.30, IHS - HS II

Subject to change

Contact: office@vgsf.ac.at

last update: 14.12.2006

[back](#)

Homepage: <http://www.vgsf.ac.at>

Course information:

[Course Information](#)