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FOR STUDENTS THAT HAD A COURSE ON ECONOMETRIC TIME SERIES ANALYSIS

INTERMEDIATE ECONOMETRICS (Time-Series Analysis)

This part of the course is designed to improve and extend understanding of financial time series modelling.

Course Outline (the approximate list of topics):

Lecture 1: Modelling univariate volatility of time series

Characteristics of volatility. The ARCH and GARCH models: properties, model building and model checking. Volatility forecasting. Modifications. Examples.

Lecture 2: Modelling multivariate volatility of time series

Exponentially weighted estimate. Some multivariate GARCH models. Reparameterization. GARCH models for bivariate returns. Factor-volatility models. Examples.

Lecture 3: Extreme values and value-at-risk

Value-at-risk (VaR): definition. RiskMetrics. Econometric approach to VaR estimation. Quantile estimation. Extreme value (EV) theory: basic elements. EV approach to VaR estimation.

Literature:

Brooks, C. (2019), *Introductory Econometrics for Finance*, Cambridge University Press, 4th edition.

Mills, T.C. (2019), *Applied Time Series Analysis*, Academic Press.

Mladenović, Z. (2023), *Lecture notes (on ARCH and GARCH)*.

Tsay, R.S. (2010), *Analysis of Financial Time Series*, Wiley, 3rd edition.

Grading:

The grade depends on homework (20 points) and final exam (30 points).

- Homework will be given at the end of the course. When finished, the homework needs to be handed in person, so that students can answer the questions directly.
- Final exam is written and contains six theoretical questions (two from each lecture).