

MASTER Economics Financial econometrics

Contact	Description	Information
Gilles DUFRENOT gilles.dufrenot@univ-amu.fr	Part of course. Code: PA-ME5BEC-BECBV5B Domain: Law, Economics, Management	http://formations.univ-amu.fr Department: Faculty of Economics and Management <i>Last modification: 07/09/2018</i>

CONTENT

1. Analyzing the properties of financial time series : application to French stock markets

The data consists of the stocks of the French CAC40 on a daily basis since 1980. Data are provided in excel format and need to be download to GRET. Different companies are used as examples.

- Computing returns and historical volatility and analyzing their graphs (mean, variance, skewness and kurtosis, quantiles, min and max, autocorrelation)
- Analyzing the distributions of returns : non-parametric approaches (histograms and CDF based on kernels ; normality tests : QQ plot, Shapiro-Wilkinson, Doornik-Hansen, Jarque-Bera, etc.)
- Informal presentation of stable distributions : index of stability, skewness parameter, scale parameter, location parameter
- Example of parametrization of a stable distribution : the regression analysis of power law distributions.

2. Regression analysis of financial data

2.1. Evaluating the performance of a money manager : CAPM model

The data consist of the S&P 500 and some of its components (General Electric, Ford, Microsoft, ORACLE) and the 3-month Treasury bill).

- Estimate of the Betas using OLS and GLS
- Test of the CAPM using a two-pass regression
- The Jensen measure to evaluate manager performance.

2.2. Modelling the term structure of interest rates

The data consist of the Government zero-coupon bond yield taken at a daily frequency from 1990 to 2017 with several maturities : 6 months, 1 year, 2 years, 4 years, 5 years, 7 years and 10 years.

- Analyzing some basic stylized facts of government bond yields (graphs of term to maturity, statistical properties, normality tests, correlation matrix, etc...).
- Recall on asset pricing, Duffie-Kan affine models and the decomposition of the yield curve.
- Decomposition of the yield curve using the Diebold's regression approach : Level, slope and curvature curves.
- Factor models : a basic presentation of Kalman filter methodology and applications to the yield curve.

3. Some benchmark models for forecasting and trading models

The data consists of US/euro, US/Japan, US/UK exchange rate (daily) from 1999 and 1977 to 2017.

3.1. Models of naive and MACD (moving average) strategies

3.2. ARMA models (identification via ACF and PACF, estimation, residual tests and forecasts)

3.3. Detecting long-range dependence structure : an introduction to ARFIMA models

3.4. Introduction to stochastic volatility models : Harvey models and ARCH-GARCH models (tests and estimation).

PROFESSIONAL SKILLS

The lecture is an introduction to practical empirical applications in the field of finance for those wishing to have a bird's-eye view of some basic properties of financial data (for instance, for portfolio management activities). The pre-requisite are basic econometrics and some basic knowledge of financial theories.

BIBLIOGRAPHY

- Rachev, S., Mittnik, S., Fabozzi, F., Focardi, S., Jasic, J., 2007, Financial econometrics. From basics to advanced modeling techniques, John Wiley and Sons.
- Dunis, C., Laws, J., Naïm, P., 2003, Applied quantitative methods for trading and investment, John Wiley and Sons.

ORGANISATION

The class will take place in a computer lab, but students are highly encouraged to bring their own laptop. The software used is GRET (amongst the simplest econometric softwares for students wishing to do applied econometrics, and available for free for both PC and MAC). The final grade consists in two parts. One part is a take-home work (done by groups of 3 students) and a second part will be in the form of a final exam. Each account for half of the total grade.

FUNDAMENTAL PREREQUISITES

Basics of linear econometrics and statistics.

VOLUME OF TEACHINGS

- Lectures: 18 hours

TRAININGS

Master's degree: Economics

- Empirical and theoretical economics
- Economic policy analysis
- Econometrics, big data, statistics
- Quantitative finance and insurance

