**Statistical methods for finance**
Instructor: Francesco Bartolucci

## Syllabus

*Revision of basic concepts of probability*: multivariate random variables; multivariate normal distribution; chi-squared distribution, *t*-student distribution, *F*-Fisher distribution.

*Revision of basic concepts of statistical inference*: notion of statistical model; maximum likelihood method; testing hypotheses on one or more parameters.

*Simple linear regression*: basic assumptions and model interpretation; parameter estimation: ordinary least squared and maximum likelihood methods; interval estimation and testing hypotheses; measuring goodness-of-fit.

*Multiple linear regression*: basic assumptions and model interpretation; parameter estimation: ordinary least squared and maximum likelihood methods; interval estimation and testing hypotheses; inclusion of categorical explanatory variables; measuring goodness-of-fit; model selection and model building; diagnostics based on residual analysis; remedial measures to violations of basic assumptions.

*Preliminaries on multivariate linear regression*: basic assumptions and model interpretation; parameter estimation via ordinary least squares.

*Preliminaries on logistic regression*: basic assumptions and model interpretation; maximum likelihood estimation of the parameters; testing hypotheses on the parameters.

## Suggested textbooks

R. A. Johnson e D. W. Wichern, *Applied Multivariate Statistical Analysis*, 6th edition, Prentice Hall, New Jersey, 2007.

S. J. Sheather, *A Modern Approach to Regression with R*, Springer Texts in Statistics, 2009.

Teaching material provided by the Instructor

## Teaching method

Lectures and practice sessions based on the R package.

## Exam

Evaluation is based on a written, an oral exam and homeworks assigned to students during the teaching period.