Facultatea de Științe Economice și Gestiunea Afacerilor

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Subject: Statistics for Economists

SYLLABUS

Topic 1.   Basic probability and probability distributions
      1.1. Probability, conditional probability, Bayes' theorem
      1.2. Discrete/ Continuous variable, mean, variance, other characteristics
      1.3. Discrete random variable, discrete distributions
      1.4. Continuous probability distributions.

Topic 2.   Joint distributions, independence, correlation
      2.1. Joint distributions
      2.2. Conditional, marginal probability distributions
      2.3. Functions of random variables
      2.4. Covariance, independence, correlation.

Topic 3.   Sampling designs and sampling distributions
      3.1. Random sampling, stratified/ cluster/ multistage sampling
      3.2. Point estimation, mean squared error, unbaised/ efficient/ consistent estimator
      3.3. Sampling distributions of sample means
      3.4. Monte Carlo simulations: Central limit theorem
      3.5. Distribution of other sample statistics.

Topic 4.   Hypothesis testing and confidence intervals
      4.1. Testing hypothesis, the type I/ type II error, power of the test, p-value
      4.2. Testing hypothesis about means/ proportions
      4.3. Testing hypothesis about variances
      4.4. Confidence intervals. The bootstrap.

Topic 5.   Association, correlation, multiple regression analysis
      5.1. Tests of association in contingency table
      5.2. Analysis of variance: One-way/Two-way ANOVA
      5.3. Correlation: coefficients, bootstrapping correlations
      5.4. Multiple regression: linear regression, OLS fit and tests, dummy variables, nonlinear regression
      5.5. Gauss-Markov theorem. Multiple regression: multicoliniarity, distribution of errors.

Topic 6.   Other topics: time series, simultaneous equation, statistical software
      6.1. Decomposition and forecasting using regression
      6.2. Forecasting using exponential smoothing
      6.3. Simultaneous equations: structural equations and reduced form, identification
      6.4. Example of simultaneous equations model: demand and supply.
      6.5. Using software SPSS and R.

NOTE: This document represents an informal translation performed by the faculty.

References:

1.   Beals, R.E., *Statistics for economists*, Rand McNally College, 1972.

2.   Wonnacott, T.H. and Wonnacott, R.J., *Introductory Statistics for Business and Economics*, Wiley , 1990.

3.   Field, A., Jeremy Miles, J. and Field, Z., *Discovering Statistics Using R*, Sage, 2012.

4.   Newbold, P., Carlson, W.L. and Thorne, B.M., *Statistics for Business and Economics,* Pearson, 2013.

5.   Cleff, T., *Exploratory data analysis in business and economics: An Introduction using SPSS, Stata, and Excel*, Springer, 2014.

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