Introduction
to Quntile,
M-quantile
and Expectile
Regression
Course
Outline

Introduction to Quntile, M-quantile and Expectile Regression
Course Outline

Nikos Tzavidis (University of Southampton)
Ray Chambers (University of Wollongong)
James Dawber(University of Wollongong)
Nicola Salvati(University of Pisa)

Pisa, July, 2016

Introduction
to Quntile,
M-quantile
and Expectile
Regression
Course
Outline

Session 1

- Defining robustness
- Estimating the centre (location) of a distribution
- Quantiles, M-quantiles & expectiles as location parameters
- Regression quantiles, M-quantiles & expectiles
- Quantile regression: Asymmetric Laplace Distribution - A Likelihood Perspective
- M-Quantile regression: Asymmetric Laplace Information Distribution - A Likelihood Perspective
- Examples
- *R* Software

Introduction
to Quntile,
M-quantile
and Expectile
Regression
Course
Outline

Session 2

- Robust Estimation for Generalized Linear Models
- Quantile, M-quantile, Expectile regression for discrete outcomes
- <u>Count Response</u>
    - Quantile regression (Machado & Santos Silva, 2005, JASA)
    - Asymmetric Maximum Likelihood (Efron, 1992, JASA)
    - M-Quantile regression (Tzavidis et al., 2014, SMMR)
- Examples & *R* Software

Introduction
to Quntile,
M-quantile
and Expectile
Regression
Course
Outline

Session 3

- The importance of data structures
- Quantile Multilevel Regression: Motivating research questions
- Quantile random effects regression by using the ALD (Geraci & Bottai, Stat. & Computing, 2013)
- M-quantile and expectile random effects regression (Tzavidis et al., 2016, JRSS A; Borgoni, Salvati et al., 2016)
- A simulation study
- Case study: Longitudinal analysis of child psychopathology outcomes in the UK
- *R* Software