



IV Residential SUMMER SCHOOL

MICROECONOMETRIC ANALYSIS IN STATA

Florence, 29 August - 4 September 2021

TStat's Microeconometrics Analysis in Stata Summer School offers participants a comprehensive introduction to the principle methodologies used in the analysis of micro data. Micro data contains information at the level of a specific unit (such as individuals, firms or entities), and has by its very nature become an increasingly important source of information offering researchers and policy makers an effective tool with which to obtain a more in-depth understanding of an array of political, socio-economic and Public Health phenomena. As such the collection and subsequent analysis of micro data over recent years has proved to be the key to policy formulation, the targeting of interventions and the subsequent monitoring and measurement of the impact of such interventions and policies.

Although these techniques have been traditionally more applied in the field of economics, the increasing availability of micro data has resulted in a steady increase in the analysis of micro data by researchers working in Political and Social Sciences, Biostatistics, Epidemiology and Public Health using the techniques originally developed for the analysis of economics.

SUMMER SCHOOL CODE

I-SS13

DATE AND LOCATION

Florence,
29 August - 4 September 2021

CISL Studium Center
Via Della Piazzola, 71
I-50123 Florence
<http://www.centrostudi.cisl.it>

PREREQUISITES

It is assumed that course participants have at some point followed a basic course in econometrics or statistics. Previous exposure to Stata or other statistical software packages would also be an advantage.

Throughout the course of the week, the tutors will focus, from both a theoretical and applied point of view, on the principal methodologies implemented for the analysis of both cross-section and panel data: linear models, count models, binary dependent variable models, multinomial models, Tobit and Interval Regression models, models with Sample Selection, and estimation of Extended Regression Models (ERM), which implement Maximum Likelihood estimators capable of simultaneously treating issues of Sample Selection and the presence of both endogenous regressors and treatment variables.

The school opens with an *optional* introductory one day course (Module A) to the statistical package Stata, during which participants will be provided with the necessary tools to enable them to use Stata independently and actively participate in the applied empirical Lab sessions during the course of the week.

In common with TStat's training philosophy, each individual course session is composed of both a theoretical component (in which the techniques and underlying principles behind them are explained), and an applied (hands-on) segment, during which participants have the opportunity to implement the techniques using real data under the watchful eye of the course tutor. Theoretical sessions are reinforced by case study examples, in which the course tutor discusses and highlights potential pitfalls and the advantages of individual techniques. The intuition behind the choice and implementation of a specific technique is of the utmost importance. In this manner, the course leader is able to bridge the "often difficult" gap between abstract theoretical methodologies, and the practical issues one encounters when dealing with real data.

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At the end of the school participants are expected to be in a position to autonomously implement, with the aid of the Stata routines utilized during the sessions, the theories and methodologies discussed during the course of the week. In particular, participants should be in able to identify the type of data required for their specific research topic; evaluate which econometric method is more appropriate for the analysis in hand; and finally test the appropriateness of their estimated model and the robustness of the results obtained.

TARGET AUDIENCE

Researchers and professionals working in biostatistics, economics, epidemiology, finance, public health, psychology, social and political sciences needing to acquire the necessary statistical requisites required to independently conduct empirical analysis using micro data.

PROGRAMME

MODULE A | DAY 1 - STATA IN JUST ONE DAY!

SESSION I: INTRODUCTION GETTING STARTED

1. Stata's GUI
2. File types in Stata
3. Working interactively in Stata
4. Saving output: the log file
5. Interrupting Stata
6. Loading Stata databases
7. The Log Output File
8. Saving databases in Stata
9. Exiting the software

SESSION II: PRELIMINARY DATA ANALYSIS

1. A preliminary look at the data: *describe*, *summarize* commands
2. Abbreviations in Stata
3. Stata's syntax
4. Summary statistics
5. Statistical Tables: *table*, *tabstat* and *tabulate* commands

SESSION III: DATA MANAGEMENT

1. Renaming variables
2. Selecting or eliminating variables
3. The *count* command
4. *sort* command
5. Creating sub-groups: the prefix *by*
6. Creating new variables: *generate*
7. Operators in Stata
8. The command *assert*
9. Missing values in Stata
10. Modifying variables: *replace*, *recode*
11. Creating Labels: variable labels and value labels
12. Creating dummy variables

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SESSION IV: IMPORTING DATA FROM SPREADSHEETS

1. *Import Excel* and *Export Excel* commands
2. The *insheet* and *outsheet* commands
3. Reading in Text Data Files
4. Issues to watch out for when importing data
 - Missing values
 - String variables
 - Date variables
5. Redefining missing values
6. *destring* command
7. *tostring* command
8. dealing with “messy” strings

SESSION V: GRAPHICS - A BRIEF INTRODUCTION

1. Stata's syntax for two way graphs
2. Saving and exporting graphs
3. Useful *graph* commands
4. Personalizing a graph
5. Stata's Graph Editor

APPENDIX A

1. Merging data bases
2. *do* files

APPENDIX B: MORE ADVANCES ISSUE (time permitting)

1. *do files*
2. Merging data bases
3. *e-class* and *r-class* variables
4. *collapse* command
5. *preserve* command
6. *restore* command

MODULE B | DAY 2 - LINEAR REGRESSION MODELS

SESSION I: THE LINEAR MODEL WITH EXOGENOUS REGRESSORS

1. Identification
2. The Ordinary Least Squares (OLS) Estimator: *regress*
3. Specification tests and tests for robust inference: *estat imtest*, *estat hettest*, *estat bgodfrey*, *actest*

SESSION II: THE LINEAR MODEL WITH ENDOGENOUS REGRESSORS

1. Identification
2. IV e GMM Estimators: *ivregress*, *gmm*
3. Specification tests and tests for robust inference: *ivhettest*, *actest*, *estat overid*, *estat endogenous*, *estat firststage*, *weakivtest*

DAYS 3 AND 4 - LINEAR PANEL DATA REGRESSION MODELS

SESSION I: PANEL DATA IN STATA SOME BASIC CONCEPTS

1. Panel Data structures in Stata
2. Time Series Operators in Stata
3. The advantages of Panel Data for applied micro data analysis

SESSION II: LINEAR PANEL DATA MODELS WITH EXOGENOUS VARIABLES

1. One-way and two-way fixed effect estimators: *xtreg*, *fe*
2. Random Effects Estimators: *xtreg*, *re*; *xtmixed*



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SESSION III: LINEAR PANEL DATA MODELS WITH EXOGENOUS VARIABLES: ROBUST INFERENCE

1. Robust covariance estimators
2. The first-difference estimator
3. Testing for non *i.i.d.* errors
4. Testing Random Effects against Fixed Effects:
 - non-robust approach using Hausman
 - robust approach using Mundlak auxiliary regression (Wooldridge, 2010)

SESSION IV: LINEAR PANEL DATA MODELS WITH ENDOGENOUS VARIABLES

1. Fixed and Random Effect IV Estimators: *xtivreg*
2. Hausman and Taylor's estimator: *xthtaylor*

DAYS 5-7 NON-LINEAR REGRESSION MODELS

SESSION I: COUNT MODEL ESTIMATORS

1. The Poisson Model: *poisson*, *nl*, *gmm*
2. The Poisson Model with endogenous regressors: *ivpoisson*, *gmm*
3. Estimation and tests in the presence of *overdispersion* (the negative binomial regression model): *nbreg*
4. Estimation and interpretation of the marginal estimation effects using Stata's post estimation command *margins*
5. Fixed and Random Panel Data Estimators: *xtpoisson*, *xtnbreg*

SESSION II: DISCRETE DEPENDENT VARIABLE MODELS

1. Estimating linear models with binary dependent variables – Logit, Probit and the Linear Probability Model: *probit*, *logit*, *regress*
2. The Heteroskedastic Probit Model and tests of heteroskedasticity: *hetprobit*
3. Measures of Goodness of Fit and Specification Tests: *estat classification*, *estat gof*
4. Estimating and interpreting marginal effects: *margins*
5. Fixed and Random Panel Data Estimators: *xtprobit*, *xtlogit*, *clogit*

SESSION III: PROBIT MODELS WITH ENDOGENOUS REGRESSORS

1. Maximum likelihood estimation in the presence of continuous endogenous regressors: *ivprobit*
2. Measures of Goodness of Fit: *tabulate*, *estat classification*, *estat correlation*
3. Estimating and interpretation of estimated marginal effects: *margins*

SESSION IV: MULTINOMIAL MODELS

1. Ordered categorical variable models (the Ordered Probit and Ordered Logit Estimators): *oprobit* and *ologit*
2. The Heteroskedastic Probit Model and tests of heteroskedasticity: *hetoprobit*
3. Random Effect Ordered Panel Data Probit Models: *xtprobit*
4. Models with unordered categorical variables - Multinomial Logit and Multinomial Probit estimators: *mlogit*, *mprobit*
5. MacFadden's Choice Model - categorical variable models with alternative specific regressors: *cmclogit*, *cmcprobit*
6. Measures of Goodness of Fit and Specification Tests
7. Estimation and interpretation of marginal effects using the Stata post estimation command *margins*

SESSION V: THE TOBIT MODEL, INTERVAL REGRESSION AND SAMPLE SELECTION

1. The Tobit Model: *tobit*
2. Estimating the Tobit model with endogenous regressors: *ivtobit*
3. Interval Regression: a generalization of the Tobit Model: *intreg*
4. Fixed and Random Effects Panel Data Estimators: *xttobit*, *xtintreg*
5. Estimators for Sample Selection Models: *heckman*

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SESSION VI: EXTENDED REGRESSION MODELS WITH BOTH ENDOGENOUS REGRESSORS AND TREATMENT EFFECTS IN THE PRESENCE OF SAMPLE SELECTION

6. Estimation and interpretation of marginal effects using the Stata post estimation command *margins*
7. Random Effect Panel Data Estimators: *xtheckman*
 1. Extended Regression Models: *eregress*
 2. Extended Regression Probit Models: *eprobit*
 3. Ordered Extended Regression Probit Models: *eoprobit*
 4. Extended Interval Regression Models: *eintreg*
 5. Extended Regression Random Effect Panel Data models: *xtregress*, *xtprobit*, *xteoprobit*, *xteintreg*

COURSE REFERENCES

- A Gentle Introduction to Stata, 6th Ed., Alan Acock (2018) Stata Press
- Data Analysis Using Stata, 3rd Ed., Ulrich Kohler, Frauke Kreuter (2012) Stata Press
- Data Management Using Stata: A Practical Handbook, 2nd Ed., Michael N. Mitchell, (2020) Stata Press
- The Workflow of Data Analysis Using Stata, J. Scott Long (2009) Stata Press
- Mostly Harmless Econometrics: An Empiricist's Companion, Joshua D. Angrist e Jorn-Steffen Pischke (2008) Princeton University Press
- Microeconometrics Using Stata, Colin Cameron and Pravin K. Trivedi (2010) Stata Press



MICROECONOMETRIC ANALYSIS IN STATA

REGISTRATION FEES

ENTIRE WEEK (MODULES A plus B, 7 days)

Full-Time Students*: € 1890.00

Academic: € 3080.00

Commercial: € 4550.00

MODULE B (6 days)

Full-Time Students*: € 1620.00

Academic: € 2640.00

Commercial: € 3900.00

*To be eligible for student prices, participants must provide proof of their full-time student status for the current academic year. Residential costs for full time students are completely sponsored by TStat Training through our **Investing in Young Researchers Programme**. Participation is however restricted to a maximum of 3 students.

Fees are subject to VAT (applied at the current Italian rate of 22%). Under current EU fiscal regulations, VAT will not however applied to companies, Institutions or Universities providing a valid tax registration number.

Please note that a *non-refundable deposit* of €100.00 for full-time students and €250.00 for Academic and Commercial participants, is required to secure a place and is payable upon registration. The number of participants is limited to 15. Places will be allocated on a first come, first serve basis.

Course fees cover: i) teaching materials (copies of lecture slides, databases and Stata routines used during the summer school; ii) a temporary licence of Stata valid for 30 days from the day before the beginning of the school; iii) half board accommodation (breakfast, lunch and coffee breaks) in a single room at the CISL Studium Centre or equivalent (7 nights for entire school, 6 nights for Modules B). Participants requiring accommodation the night of the final day of the school, are requested to contact us as soon as possible.

To maximize the usefulness of this summer school, we strongly recommend that participants bring their own laptops with them, to enable them to actively participate in the empirical sessions.

Individuals interested in attending this summer school must return their completed registration forms by email (training@tstat.eu) to TStat by the **9th August 2021**.

Further details regarding our registration procedures, including our commercial terms and conditions, can be found at <https://www.tstattraining.eu/training/microeconometric-analysis-stata/>

COURSE LEADERS

Dr. Una-Louise BELL
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Dr. Giovanni BRUNO
Bocconi University, Milan

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