

Table of contents

1	Master courses that cover methods necessary for empirical analyses	2
1.1	Basic courses in statistics and econometrics.....	2
1.2	Advanced courses in econometrics	2
2	Software packages for econometric analyses	3
2.1	STATA (highly recommended).....	3
2.2	SAS.....	4
2.3	R (Freeware)	5
3	Literature recommendations	6
3.1	Statistics.....	6
3.2	Econometrics.....	6
3.2.1	Basic Econometrics.....	7
3.2.2	Advanced Econometrics	7

1 Master courses that cover methods necessary for empirical analyses

This chapter gives an overview of the available courses at the University of Cologne that prepare to conduct empirical analyses and econometric modeling. Note that these courses are recommended, but not mandatory. Descriptions and contents of the courses can be found in the [Modulhandbuch](#).

1.1 Basic courses in statistics and econometrics

In general, understanding the basic econometric methodology in depth requires the knowledge of the underlying **fundamental statistical principles**. These are e.g. covered by the following courses:

- Statistik für Fortgeschrittene – Stochastische Modelle
- Statistik für Fortgeschrittene – Statistisches Schließen

Introductory courses that cover the **basics in econometrics** are the following:

- Linear Models (Software: STATA)
- Econometrics (Software: GRETL)
- Empirical Finance (Software: STATA)

1.2 Advanced courses in econometrics

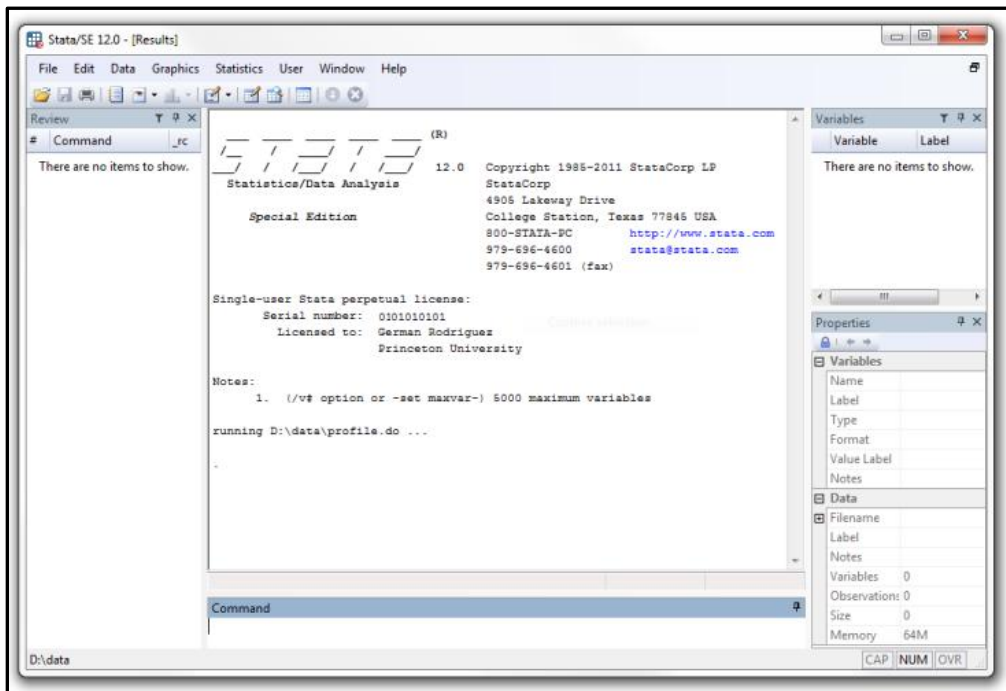
Courses that cover the specifics of **panel or time series data** are the following:

- Advanced Econometrics: Microeconometrics (Software: STATA + R)
- Causal Analysis (Software: STATA)
- Advanced Econometrics: Time Series Analysis (Software: R)
- Advanced Applied Econometrics (Software: STATA+R)

2 Software packages for econometric analyses

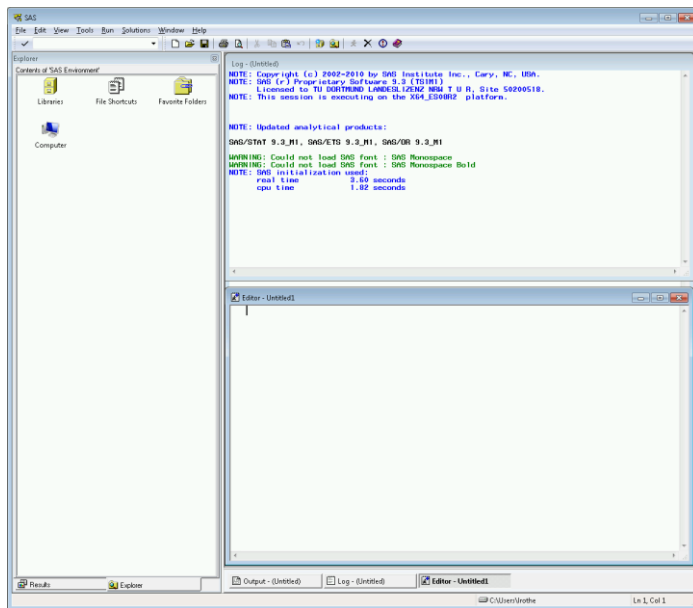
The following section gives an overview of common software packages used in conducting empirical analyses and regression analyses in particular. For your thesis you will choose the software in agreement with your supervisor which in most cases will be STATA. Software licenses are provided by our chair for the duration of your thesis.

2.1 STATA (highly recommended)



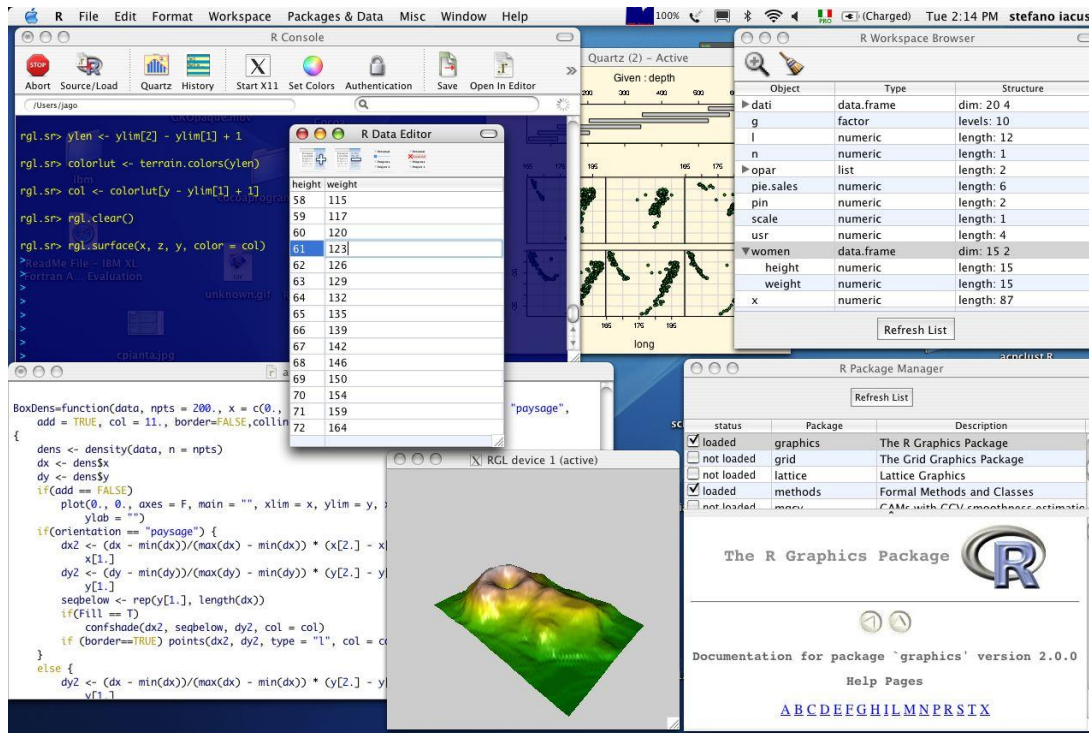
- **Homepage:** <http://www.stata.com/>
- **Tutorials:** <http://www.stata.com/links/resources-for-learning-stata/>
- **Manuals:** <http://www.stata.com/bookstore/documentation-set/>
- **Accompanying literature:**
 - ↳ English:
 - ◆ Acock, A. C. (2012) - A Gentle Introduction to Stata
 - ◆ Baum, C. F. (2009) - An Introduction to Stata Programming
 - ◆ Hamilton, L. C. (2012) - Statistics with STATA: Version 12
 - ◆ Kohler, U. / Kreuter, F. (2012) - Data Analysis Using Stata
 - ◆ Longest, K. C. (2011) - Using Stata for Quantitative Analysis
 - ◆ Mitchell, M. N. (2010) - Data Management Using Stata: A Practical Handbook
 - ◆ Mitchell, M. N. (2012) - Interpreting and Visualizing Regression Models Using Stata
 - ◆ Mitchell, M. N. (2012) - A Visual Guide to Stata Graphics
 - ↳ German:
 - ◆ Kohler, U. / Kreuter, F. (2012) - Datenanalyse mit Stata: Allgemeine Konzepte der Datenanalyse und ihre praktische Anwendung

2.2 SAS



- **Homepage:** <http://www.sas.com/offices/europe/germany/software/analytics/index.html>
- **Tutorials:**
 - ↳ <http://www.stattutorials.com/SAS/index.html>
 - ↳ <http://www.melicharek.at/Saseinf.htm>
 - ↳ <http://www.ats.ucla.edu/stat/sas/>
- **Manuals:**
 - ↳ SAS\STAT: <http://support.sas.com/documentation/onlinedoc/stat/index.html>
 - ↳ SAS\ETS: <http://support.sas.com/documentation/onlinedoc/ets/index.html>
- **Accompanying literature:**
 - ↳ **English:**
 - ◆ Cody, R. / Smith, J. K. (2005) - Applied Statistics and the SAS Programming Language
 - ◆ Cody, R. (2007) - Learning SAS by Example: A Programmer's Guide
 - ◆ Cody, R. (2010) - SAS Functions by Example
 - ◆ Cody, R.(2011) - SAS Statistics by Example
 - ◆ Delwiche, L. / Slaughter, S. (2008) - The Little SAS Book: A Primer
 - ◆ Elliott, A. C. / Woodward, W. A. (2009) - SAS Essentials: A Guide to Mastering SAS for Research
 - ◆ Field, A. / Miles, J.(2010) - Discovering Statistics Using SAS
 - ◆ McDaniel, S. / Hemedinger, C. (2010) - SAS For Dummies
 - ◆ SAS-Institute (2011) - SAS Certification Prep Guide: Base Programming for SAS 9
 - ◆ SAS-Institute (2011) - SAS Certification Prep Guide: Advanced Programming for SAS 9
 - ↳ **German:**
 - ◆ Krämer, W. (2009) - Datenanalyse mit SAS: Statistische Verfahren und ihre grafischen Aspekte
 - ◆ Schendera, C. F. G. (2004) - Datenmanagement und Datenanalyse mit dem SAS-System

2.3 R (Freeware)



- **Homepage:** <http://www.r-project.org/>
- **Manuals:** <http://cran.r-project.org/manuals.html/>
- **Accompanying literature:**
 - ↳ **English:**
 - ◆ Adler, J. (2010) – R in a nutshell
 - ◆ Chambers, J. (2009) - Software for Data Analysis: Programming with R
 - ◆ Field, A. et al. (2012) - Discovering Statistics Using R
 - ◆ Kabacoff, R. I. (2011) - R in Action: Data Analysis and Graphics with R
 - ◆ Matloff, N. (2011) - The Art of R Programming: A Tour of Statistical Software Design
 - ◆ Mittal, H. (2011) - R Graph Cookbook
 - ◆ Spector, P. (2008) –Data manipulation with R
 - ◆ Teetor, P. (2011) – R cookbook
 - ↳ **German:**
 - ◆ Faes, G. (2010) - Einführung in R: Ein Kochbuch zur statistischen Datenanalyse mit R
 - ◆ Hatzinger, R. et al. (2011) - R-Einführung: Einführung durch angewandte Statistik
 - ◆ Hedderich, J. / Sachs, L.(2011)- Angewandte Statistik: Methodensammlung mit R
 - ◆ Ligges, U. (2008) - Programmieren Mit R
 - ◆ Luhmann, M. (2011) - R für Einsteiger: Einführung in die Statistiksoftware für die Sozialwissenschaften
 - ◆ Wollschläger, D. (2012) -Grundlagen der Datenanalyse mit R: Eine anwendungsorientierte Einführung

3 Literature recommendations

The following section lists selected literature in statistics, basic econometrics and more advanced topics in econometrics. Note that our recommendations are boldfaced.

3.1 Statistics

As econometrics is a lot about hypothesis testing which is done by statistical tests, we recommend repeating statistics, and statistical inference in particular, before advancing to econometrics. The background is that most econometric literature requires the reader to have at least some basic knowledge in that area to understand the basic principles.

- **English**

- ↗ **Casella, G. / Berger, R. L. (2001) – Statistical inference**
- ↗ DeGroot, M. H. / Schervish, M. J. (2011) – Probability and statistics
- ↗ Grimmett, G. R. / Stirzaker, D. R. (2001) - Probability and Random Processes
- ↗ **Spanos, A. (1999) - Probability Theory and Statistical Inference: Econometric Modeling with Observational Data**
- ↗ Wasserman, L. (2010) - All of Statistics: A Concise Course in Statistical Inference

- **German**

- ↗ Bamberg, G. et al. (2011) - Statistik
- ↗ Bley Müller, J. (2012) - Statistik für Wirtschaftswissenschaftler
- ↗ Fahrmeir, L. et al. (2009) - Statistik: Der Weg zur Datenanalyse
- ↗ **Mosler, K. / Schmid, F. (2010) - Beschreibende Statistik und Wirtschaftsstatistik**
- ↗ **Mosler, K. / Schmid, F. (2010) - Wahrscheinlichkeitsrechnung und schließende Statistik**
- ↗ Schlittgen, R. (2010) - Statistische Inferenz
- ↗ Schlittgen, R. (2012) - Einführung in die Statistik: Analyse und Modellierung von Daten
- ↗ Schwarze, J. (2009) - Grundlagen der Statistik 1: Beschreibende Verfahren
- ↗ Schwarze, J. (2009) - Grundlagen der Statistik 2: Wahrscheinlichkeitsrechnung und induktive Statistik

3.2 Econometrics

The literature in econometrics can be categorized as **basic literature**, that covers a wide range of econometric topics without going into depth in the specific areas, and the more advanced literature which is often focused on **specific topics** like panel-data, time series analysis or limited dependent variables. Additionally, the basic literature differs regarding the extent to which **matrix algebra** is used (while the advanced literature almost always uses matrix algebra). Note that those texts which refrain from using matrix algebra are often easier to understand in the beginning. But this comes at a price since derivations in matrix notation later are much more concise and at some points indispensable.

3.2.1 Basic Econometrics

- **English**

- ↗ Undergraduate level

- ◆ Gujarati, D. N. / Porter, D. C. (2008) - Basic Econometrics
 - ◆ Hill, R. C. et al. (2000) - Undergraduate Econometrics
 - ◆ Johnston, J. / Dinardo, J. (1996) - Econometric Methods

- ↗ Advanced undergraduate level

- ◆ Dougherty, C. (2011) – Introduction to Econometrics
 - ◆ Kennedy, P. (2008) - A Guide to Econometrics
 - ◆ Stock, J. H. / Watson, M. W. (2010) – Introduction to Econometrics
 - ◆ **Verbeek, M. (2012) - A Guide to Modern Econometrics** (matrix algebra based)
 - ◆ **Wooldridge, J. M. (2012) - Introductory Econometrics: A Modern Approach**

- ↗ Graduate level

- ◆ Davidson, R. / MacKinnon, J. G. (2003) - Econometric Theory and Methods
 - ◆ Greene, W. (2011) – Econometric Analyses
 - ◆ **Hayashi, F. (2000) – Econometrics**

- **German**

- ↗ Assenmacher, W. (2002) - Einführung in die Ökonometrie

- ↗ Auer, B. R. / Rottmann, H. (2011) - Statistik und Ökonometrie für Wirtschaftswissenschaftler: Eine anwendungsorientierte Einführung

- ↗ Fahrmeir, L. et al. (2009) - Regression: Modelle, Methoden und Anwendungen

- ↗ Hackl, P. (2012) - Einführung in die Ökonometrie

- ↗ **von Auer, L. (2011) - Ökonometrie: Eine Einführung**

- ↗ Winker, P. (2010) - Empirische Wirtschaftsforschung und Ökonometrie

3.2.2 Advanced Econometrics

- **Panel data:**

- ↗ Arellano, M. (2003) - Panel Data Econometrics

- ↗ Baltagi, B. H. (2008) - Econometric Analysis of Panel Data

- ↗ Cameron, A. C. /Trivedi, P. K. (2005) - Microeconometrics: Methods and Applications

- ↗ Cameron, A. C. /Trivedi, P. K. (2010) - Microeconometrics Using Stata, Revised Edition

- ↗ Frees, E. W. (2004) - Longitudinal and Panel Data: Analysis and Applications in the Social Sciences

- ↗ **Hsiao, H. C. (2003) - Analysis of Panel Data**

- ↗ **Wooldridge, J. M. (2010) - Econometric Analysis of Cross Section and Panel Data**

- **Time Series Analysis:**

- ↗ Box, G. E. P. et al. (2008) - Time Series Analysis: Forecasting and Control
- ↗ **Brockwell, P. J. / Davis, R. A. (2002) - Introduction to Time Series and Forecasting**
- ↗ Brockwell, P. J. / Davis, R. A. (2009) - Time Series: Theory and Methods
- ↗ Cowpertwait, P. S. P. / Metcalfe, A. V. (2009) - Introductory Time Series with R
- ↗ Cryer, J. D. / Chan, K.-S. (2010) - Time Series Analysis: With Applications in R
- ↗ **Enders, W. (2009) - Applied Econometric Times Series**
- ↗ Hamilton, J. D. (1994) - Time Series Analysis
- ↗ Lütkepohl, H. (2007) - New Introduction to Multiple Time Series Analysis
- ↗ **Shumway, R. H. / Stoffer, D. S. (2010) - Time Series Analysis and Its Applications: With R Examples**
- ↗ Tsay, R. S. (2010) - Analysis of Financial Time Series
- ↗ Wei, W. W. S. (2005) - Time Series Analysis : Univariate and Multivariate Methods