

## APPLIED ECONOMETRICS SM 4028-06

**Instructors:** prof. Marek Gruszczyński, dr Katarzyna Bień, Institute of Econometrics

**Class meetings:** Thursdays 11:40–13:20, room 113, building A

**Office hours:** Thursdays 15:30–17:00, room 4, building F

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### Selection of texts

Baum, Ch. F., *An introduction to modern econometrics using Stata*, Stata Press, 2006

Greene W.H., *Econometric analysis*, 5<sup>th</sup> ed., Prentice Hall, 2003

Heij, C., P. de Boer, P.H. Franses, T. Kloek, H. K. van Dijk, *Econometric methods with applications in business and economics*, Oxford University Press, 2004

Murray M.P., *Econometrics. A modern introduction*, Pearson, 2006

Stock J.H., M.W. Watson, *Introduction to econometrics*, 2<sup>nd</sup> ed., Pearson, 2007

Wooldridge J.M., *Introductory econometrics: a modern approach*, 2<sup>nd</sup> ed., South-Western, 2003

Wooldridge J.M., *Econometric analysis of cross section and panel data*, MIT Press 2002

Verbeek M., *A guide to modern econometrics*, Wiley, 2<sup>nd</sup> ed., 2004

### Course objectives

The objectives of this course are:

- to familiarize students with theories and techniques of applied econometrics,
- to develop skills for specification, estimation and validation of various types of econometric models, especially in the area of microeconomics,
- to study major dangers in econometric modeling,
- to explore the key application areas of econometrics,
- to learn how to use econometric software.

The course is oriented on econometric analysis of cross-section data.

### Software

The programs to be used during the classes include: Gretl, PcGive, Stata and Excel. For their own projects students may use any econometric software that implements the methods incorporated in this course.

### Mid-term exam

A mid-term exam will be given in the class on 6<sup>th</sup> December or 13<sup>th</sup> December, 2007. It will test students' knowledge and understanding of the important econometric principles, methods and practices covered in the course. There will be no final exam in the course.

### Econometric project

Each students will perform econometric research project that applies techniques covered by the course. The project's outcome will be reported in the project paper. The econometric project paper should be the student's own work and written for this course.

The project paper is due January 17, 2008 in printed and readable form.

One page paper proposal is due December 13, 2007. The proposal should contain at least 3 references to literature and a short description of the topic you attempt to explore. Students are permitted to work in pairs in researching, writing and submitting the two project papers. Obviously, students have the option of doing projects individually.

### Course grade

The final course grade will be calculated with the following weights:

- 1) mid-term exam: 40%
- 2) econometric project paper: 60%

Student not attending classes will not be graded.

### Guidelines for paper

Econometric project paper presents the report on student's own applied econometrics research. There are no restrictions as to the topic, although your research should use techniques developed in this course. The paper should include:

**Introduction**, stating the question being asked and why it is of interest.

**Specification of the model**, providing a formal description of the economic and statistical aspects of the model you are employing, together with possible hypotheses and restrictions.

**Data description**, presenting your data set (source, variable definitions, summary statistics).

**Estimation results**, with tables of the estimated model(s) and your interpretation of your findings,

**Conclusion**, describing what you have learned from this exercise and, perhaps, what further analysis or data collection might be suggested by your results.

### Tentative class schedule

|   | Topic   | Application  |
|---|---|--|
| 1 | Applied econometrics and its tools. Variables, equations, models. Data. Microeconometrics | Excel, PcGive, Gretl, Stata.<br>Handy webpages.                                  |
| 2 | Features of cross-section data. Specification errors. Outliers. Goodness of fit.          | Estimation and forecasting with PcGive.<br>Bank wages [Heij et al.]              |
| 3 | Selection of variables. Testing linear restrictions                                       | Sovereign credit ratings [Brooks]<br>Cobb-Douglas production function [Greene].  |
| 4 | Testing for autocorrelation. LM test  | Risk premium model [Verbeek].  |
| 5 | Testing for heteroscedasticity. HCSE  | Hedonic pricing models [Brooks, Verbeek].<br>Cigarette consumption [Wooldridge]. |
| 6 | Multicollinearity: exact and near. Ridge regression. Principal components                 | Men and women wages (wage discrimination) [Verbeek].                             |
| 7 | Nonlinear models. Testing loglinearity vs. linearity. Box-Cox transformation.             | Money demand equation [Greene].<br>Coffee sales [Heij et al.]                    |
| 8 | Linear probability model. Logit and probit. Estimation for macro- and microdata.          | Labour market participation [Mroz].  |

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|----|---|---|
| 9  | Specification of logit models.<br>Interdependence matrix. | Loan applications. Credit scoring [Greene, Gruszczyński].                             |
| 10 | Ordered multinomial logit.                                | Financial distress of companies [Gruszczyński]  |
| 11 | Panel data with two time periods.                         | Drunk driving [Stock, Watson]. Crime rate [Wooldridge].                               |
| 12 | Distributed lags. ADL                                     | Orange juice prices [Stock, Watson].  |
| 13 | Systems of regression equations: SURE                     | Investment decisions [Grunfeld]. Capital asset pricing model: CAPM [Greene, Verbeek]. |
| 14 | Simultaneous equations: identification and estimation.    | Klein's model: 2SLS estimation in PcGive.   |

### Access to econometric papers

<http://akson.sgh.waw.pl/biblioteka/> search: „Czasopisma obcojęzyczne dostępne on-line”  
<http://econpapers.hhs.se/>  
<http://www.repec.org/>  
<http://www.econ.uiuc.edu/~econ472/papers.htm>  
<http://www.econ.ku.dk/CAM/>  
[http://cemmap.ifs.org.uk/working\\_papers.shtml](http://cemmap.ifs.org.uk/working_papers.shtml)

### Links to econometric textbooks

<http://www.feweb.vu.nl/econometriclinks/textbooks/>  
[http://www.bookfinder.us/Business\\_\\_\\_Economics/Economics/Econometrics.html](http://www.bookfinder.us/Business___Economics/Economics/Econometrics.html)

### Data pages

<http://www.economagic.com/>  
<http://www.ipums.umn.edu/>  
<http://www.stanford.edu/~clint/bench/#logit>  
<http://www.stat.gov.pl/>  
 and many other, including data accompanying webpages of textbooks

### Free econometric software package

<http://gretl.sourceforge.net/> and <http://www.kufel.torun.pl/>

### PcGive webpage

<http://www.economics.ltsn.ac.uk/links.htm>

### Econometric links (including papers and data)

<http://www.feweb.vu.nl/econometriclinks/>  
<http://www.economics.ltsn.ac.uk/links.htm>

**Selected textbooks in econometrics with home pages**

- Bareto H., F.M. Howland, *Introductory econometrics*, Cambridge University Press, 2006,  
<http://caleb.wabash.edu/econometrics/index.htm>
- Brooks C., *Introductory econometrics for finance*, Cambridge University Press, 2002,  
<http://publishing.cambridge.org/resources/0521790182/>
- Greene W.H., *Econometric analysis*, 5<sup>th</sup> ed., Prentice Hall, 2003,  
<http://www.stern.nyu.edu/~wgreene/Text/econometricanalysis.htm>; <http://shazam.econ.ubc.ca/student/greene/>
- Gujarati D.N., *Basic Econometrics*, 4<sup>th</sup> ed., McGraw Hill, 2003,  
<http://highered.mcgraw-hill.com/sites/0072335424/>
- Hayashi F., *Econometrics*, Princeton University Press, 2000,  
<http://pup.princeton.edu/titles/6946.html>; <http://fmwww.bc.edu/ec-p/data/hayashi/hayashi2000.html>
- Heij, C., P. de Boer, P.H. Franses, T. Kloek, H. K. van Dijk, *Econometric Methods with Applications in Business and Economics*, Oxford University Press, 2004,  
<http://www.oup.com/uk/booksites/content/0199268010/>
- Hill R.C., W.E. Griffiths, G.G. Judge, *Undergraduate econometrics*, 2<sup>nd</sup> ed., Wiley, 2001,  
<http://shazam.econ.ubc.ca/student/hill/>
- Judge G.G., R.C. Mittelhammer, C.J. Miller, *Econometric foundations*, Cambridge Univ. Press, 2000,  
<http://www.econometricfoundations.com/>
- Maddala G.S., *Introduction to econometrics*, 3<sup>rd</sup> ed., Wiley, 2001,  
<http://www.wiley.co.uk/wileychi/maddala/>
- Murray M.P., *Econometrics. A modern introduction*, Pearson, 2006,  
[http://wps.aw.com/aw\\_murray\\_economtrcs\\_1/](http://wps.aw.com/aw_murray_economtrcs_1/)
- Patterson K., *An introduction to applied econometrics: a time series approach*, St. Martin's Press, 2000, <http://www.palgrave.com/economics/patterson/>
- Poo J.R., *Computer-aided introduction to econometrics*, Springer, 2003,  
[www.quantlet.com/mdstat/scripts/xegbo/pdf/xegbopdf.pdf](http://www.quantlet.com/mdstat/scripts/xegbo/pdf/xegbopdf.pdf)
- Stock J.H., M.W. Watson, *Introduction to econometrics*, 2<sup>nd</sup> ed., Pearson, 2007,  
[http://wps.aw.com/aw\\_stock\\_ie\\_2/](http://wps.aw.com/aw_stock_ie_2/)
- Wooldridge J.M., *Introductory econometrics: a modern approach*, 2<sup>nd</sup> ed., South-Western, 2003,  
<http://www.swlearning.com/economics/wooldridge/wooldridge2e/wooldridge2e.html>
- Wooldridge J.M., *Econometric Analysis of Cross Section and Panel Data*, MIT Press 2002,  
<http://mitpress.mit.edu/Wooldridge-EconAnalysis>
- Verbeek M., *A guide to modern econometrics*, Wiley, 2000, (2<sup>nd</sup> ed. 2004),  
<http://www.econ.kuleuven.ac.be/GME/>