Syllabus for Advanced Econometrics

Fall 2020

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TA sessions: One session every 2-3 weeks after the lecture
Lecture time and place:
Monday, evening 6:00-8:30pm, the 1st Public Teaching Building, 1304

The aim of the course

This course is designed for the first year PHD students in Economics. We introduces the standard graduate econometrics material from a modern perspective. It almost covers all the standard material necessary for understanding the principal techniques of econometrics. The intention is that the material will provide a solid foundation for applied research in economics and social science. After taking this course, students should be able to:

1. Understand standard material in econometrics;
2. Choose appropriate models and estimators for given economic applications;
3. Interpret regression model estimates;
4. Diagnose potential problems with models and know how to remedy them;
5. Have sufficient grounding in econometric theory to begin advanced work in the field

Prerequisite knowledge

1. Econometrics (undergraduate level such as baby Wooldridge or Stock & Watson);
2. Calculus, Linear Algebra, Statistics and Probability (undergraduate level)

Textbooks and references

1. *Econometrics* by Fumio Hayashi, 2000. Princeton University Press. (**Required**)
2. *Econometrics* by Bruce Hansen, 2020.08. You can download the lecture notes from Hansen's website: http://www.ssc.wisc.edu/~bhansen/econometrics (**Required**)

(Other useful textbooks)

3. *Econometric Analysis of Cross Section and Panel Data* by Jeffrey Wooldridge
4. *Econometric Analysis* by William H. Greene
5. *Mostly Harmless Econometrics* by Joshua Angrish and Jorn-Steffen Pischke

(Other alternative textbooks)

6. Arthur S. Goldberger, *A Course in Econometrics* (1991)
7. Paul A. Ruud, *An Introduction to Classical Econometric Theory* (2000)
8. James Davidson, *Econometric Theory* (2000)
9. Russell Davidson and James G. MacKinnon, *Estimation and Inference in Econometrics* (1993)

(Econometric theory)

10. *Handbook of Econometrics*, Volumes I-V.
11. Takeshi Amemiya, *Advanced Econometrics* (1985).
12. James Davidson, *Stochastic Limit Theory* (1994)

(Textbooks at undergraduate level)

13. Wooldridge, Jeffrey M., *Introductory Econometrics: A Modern Approach*, 6th Edition, 2015.
14. Stock and Watson, *Introduction to Econometrics*, 3rd Edition, 2014.
(Online lecture notes)
15. Frank Diebold at Upenn. http://www.ssc.upenn.edu/~fdiebold/Textbooks.html
16. Yongmiao Hong's online course <Advanced Econometrics> (**strongly recommend!**)
(Textbook in Chinese)
17. 赵国庆-计量经济学，新编 21 世纪经济学系列教材，人民大学出版社

Softwares

Knowledge in *Stata* is required. Nevertheless, if you are familiar with Eviews, R, Matlab, Python or Julia you can also use it for your homework questions.

Reference for Stata：Baum, C. F., 2006. An Introduction to Modern Econometrics Using Stata.

Online resources

(1) 人大经济论坛 Stata 版块 ;

(2) http://www.princeton.edu/~otorres/Stata/

Course Contents (tentatively)

0. Brief review of matrix algebra
1. General regression analysis
2. Classical linear regression model (finite sample theory and algebra)
3. Large sample theory for linear regression models
4. Linear regression with time series processes
5. Additional topics in regression analysis
6. Instrumental variable (IV) estimation
7. General method of moment (GMM) estimation
8. Other topics if time permits

Evaluation: 30+15+35+20=100 points

A. Class attendance and homework：30 points
B. Mid exam：closed-book, 15 points
C. Final exam：closed-book, 35 pints
D. Term paper：20 points

(NO LATE HOMEWORK AND TERM PAPER WILL BE ACCEPTED)

Lastly, some free advices for learning Econometrics

1. Stop complaining and take the time to read the textbook and lecture notes
2. Doing homework is a key step for your learning econometrics
3. Group discussions or group study may help
4. Digest the course material week by week
5. Welcome to Office hours and TA sessions
6. You should use online resources wisely