

ECON 771
Econometrics II
SPRING 2020

Instructor: Andrii Babii

Time and Location: T and Th, 3:30pm-4:45pm, Gardner 106

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Recitations: F 9:05am-9:55am, Gardner 209

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Office Hours: by appointment

Prerequisites

Econ 770 is required. Some knowledge of probability theory, statistics, and linear algebra is mandatory. The knowledge of undergraduate-level econometrics can be helpful.

Course description

This course is a continuation of Econ 770 with emphasis on theoretical foundations and practical applications of basic econometric tools. Topics include least squares, asymptotic theory, MLE, discrete choice models, endogeneity, instrumental variables, GMM, time series analysis, and panel data. Problem sets will require solving theoretical exercises and empirical work.

Problem Sets

There will be weekly problem sets. You can use Matlab or R for computer tasks. Your lowest grade problem set will not count towards the final grade, but you should submit all problem sets. You can discuss problem sets in groups, however, everyone should handle in her/his own solution. Please list names of all people whom you discussed solutions with. You should submit the hard copy at the beginning of the class and send your code to Yiyao.

Grading

Your final grade will be based on:

- 20% problem sets (12 best)
- 30% midterm, 2/25 (in class)
- 50% final, 5/03 (3 hours)

Tentative schedule

#	Date	Topics	Problem Sets	
			Posted	Due
1	1/9	Economic data and econometric models		
2	1/14	OLS: algebra	PS 1	
3	1/16	OLS: geometry		
4	1/21	OLS: finite-sample properties	PS 2	PS 1
5	1/23	Inference: testing and confidence sets		
6	1/28	OLS: finite-sample inference	PS 3	PS 2
7	1/30	Large sample theory I		
8	2/4	Large sample theory II	PS 4	PS 3
9	2/6	Linear regression: asymptotic properties		
10	2/11	Linear regression: standard errors	PS 5	PS 4
11	2/13	Linear regression: asymptotic inference		
12	2/18	Linear regression: bootstrap	PS 6	PS 5
13	2/20	Midterm exam		
14	2/25	Maximum Likelihood Estimation I	PS 7	PS 6
15	2/27	Maximum Likelihood Estimation II		
16	3/3	IV: endogeneity	PS 8	PS 7
17	3/5	IV: estimation and asymptotic properties		
Spring Break				
18	3/17	IV: hypothesis testing	PS 9	PS 8
19	3/19	GMM: moment restrictions		
20	3/24	GMM: asymptotic properties	PS 10	PS 9
21	3/26	GMM: hypothesis testing		
22	3/31	GMM: weak identification and optimal instruments	PS 11	PS 10
23	4/2	Time series: weak stationarity and Wold's decomposition		
24	4/7	Time series: stationarity and estimation of ARMA	PS 12	PS 11
25	4/9	Time series: forecasting		
26	4/14	Panel Data: fixed effects I	PS 13	PS 12
27	4/16	Panel Data: fixed effects II		
28	4/21	Panel Data: random effects		PS 13
29	4/23	Missing data		

References

1. My lecture notes.
2. Suggested textbooks:
 - (a) Hayashi, *Econometrics*
 - (b) Hansen *Econometrics*, on-line textbook: <http://www.ssc.wisc.edu/~bhansen/econometrics/>
3. Optional reading:
 - Angrist and Pischke *Mostly Harmless Econometrics*
 - Florens, Marimoutou, Anne Peguin-Feissolle "Econometric Modeling and Inference"
 - Frölich and Sperlich "Impact Evaluation" for causal inference.
 - Wooldridge, *Econometric Analysis of Cross-section and Panel data*
 - Davidson and MacKinnon "Econometric Theory and Methods"
 - *Handbook of Econometrics*, Vol I-VIB are great for methodological literature reviews.
 - Manuel Arellano *Panel Data Econometrics*
 - Abadir and Magnus *Matrix algebra* for a comprehensive reference of matrix calculus and algebra
4. If this is your first econometrics course for more intuition you can check
 - *Introduction to Econometrics* by Stock and Watson
 - *Introductory Econometrics: A Modern Approach* by Wooldridge