Syllabus
Applied Statistics and Econometrics II
Econ-GA 1102.01, NYU Economics
Spring 2018

Instructor	: **Ercan Karadas**
Lectures	: R 6:20 - 8:20 PM, Silver 414
Lab	: R 8:25 - 10:25 PM, Silver 414
Office Hours	: By appointment
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Course Description: This course is the second part of a two semester sequence designed to teach applied statistics and econometric techniques for quantitative research and analysis. The course is structured in three units. In the first unit, we will cover the main estimation methods in econometrics, including Instrumental Variables, Generalized Regression Model, General Methods of Moments and Maximum Likelihood Estimation. In the second and third units, we will discuss selected topics in macroeconometrics and microeconometrics, respectively.

Readings:

- [**DM**] *Econometric Theory and Methods* by R. Davidson and J.G. MacKinnon, Oxford University Press, 2003
- [**G**] *Econometric Analysis* by W. Greene, 7th ed., Prentice Hall
- [**P**] *Time Series and Panel Data Econometrics* by M. Hashem Pesaran, Oxford University Press, 2015
- [**H**] *Econometrics* by Fumio Hayashi, Princeton University Press, 2000
- [**LN**] *Lecture Notes*

Students are expected to have completed the Readings ahead of class to facilitate class participation and discussion. You need to take this seriously to be able to make the most out of this class as we will cover a lot of advanced material.

Programming: The course will make heavy use of the statistical software R. Software related issues and questions should be resolved in the lab sessions.

Attendance: Class and Lab attendance and participation are expected and required. If you anticipate to be unable to attend either the Class or the Lab you need to notify me ASAP. Use of laptops and cellphone during class is strictly prohibited.

Project: You are going to submit an applied econometric research project that relates to the material covered in the course. For the details of this requirement please read the section at the end of the syllabus.

Problem Sets: There will be weekly problem sets during the semester.

Course Page: NYU Classes is a major tool for this course. Folders for each topic listed on the schedule with slides and readings will be posted as well as announcements and any supplementary reading. You are expected to login to NYU Classes between classes.

Evaluation

Test 1	20%	Project	20%
Test 2	20%	Problem Sets	20%
Test 3	20%		

Weekly Course Schedule (Tentative)

Week	Topics	Readings
1/25	Course Introduction	
	Review of GLS Estimator	[**G**] Ch. 9
2/1	Systems of Equations	[**G**] Ch. 10.1-10.3
		[**G**] Ch. 10.5-10.7
	Application: Demand Systems	
	Stone (1956)	[**LN**]
2/8	Estimation Frameworks	[**G**] Ch. 12.1-12.3
	Generalized Method of Moments	[**G**] Ch. 13
	Application: Estimating Euler Equations	
	Hansen and Singleton (1982)	[**LN**]
2/15	Maximum Likelihood Estimation	[**G**] Ch. 14.1-14.7
		[**G**] Ch. 14.9.1-14.9.5
	Application: ML Estimates of a SUR Model	
2/22	**Test 1**	
3/1	Macroeconometrics I	
	Time Series Models, ARIMA Modeling	[**G**] Ch. 20
3/8	Macroeconometrics II	
	Nonstationarity and Cointegration	[**G**] Ch. 21
3/15	No Class (Spring Recess)	
3/22	Macroeconometrics III	
	Vector Autoregression (VAR) Model	[**LN**]
	Impulse Response Functions	[**LN**]
	Application: Econometrics of a Simple RBC Model	[**LN**]
3/29	**Test 2**	
4/5	Microeconometrics I	
	Panel Data Models	[**G**] Ch. 11.1-11.5
4/12	Microeconometrics II	
	Discrete Choice	[**G**] Ch 17.1-17.3
	Limited Dependent Variables	[**G**] Ch 19
4/19	Microeconometrics III	
	Application: Estimating a Simple Occupational Choice Model	[**LN**]
4/26,5/3	Paper Presentations in Class	
5/10	**Test 3**	

Details of the Term Project

- The requirements for the course include a brief, concise term paper, on a topic of your choice, which utilizes appropriate applied econometric techniques. The purpose of the paper should be the following: *put the main contributions in that literature into a perspective and replicate some of these main contributions along the way.*
- You will work on the project in a group of maximum 3 students.
- In the next section I provide some suggested topics that you can write your term paper on. But you can of course choose something else as long as it contains some relevant econometrics.
- These papers are chosen either because they have been very influencial on the respective literature or because they provide an overall view of that literature. In either case, you should take these papers just as representative papers or just as introductions to those particular topics and you should go beyond them.
- The paper should start with a consice description of the economic problem and then an up to date literature review. You should manifest that you have a good grasp of that literature including the recent discussions and contributions.
- Then the core of the paper should be about econometrics. What type of econometric methods have been used in that literature? Has there been any controversy about which econometric techniques are more appropriate? Are the results sensitive to chosen econometrics techniques, etc.
- You must make use of a non-trivial cross-section, time series or panel dataset and the appropriate methodologies. The econometric techniques displayed in the paper should go beyond application of an elementary technique. In this part, you should replicate the main findings of at least two-three papers in that literature. These papers can be either the original papers I listed below or they can be some other influential papers in the same literature.
- Most likely, you will need to go beyond what we have seen in class in terms of econometric techniques you need. In that case, you can include a section to explain those topics concisely and give relevant references. This section shouldn't be too long. If you want to include a more detailed exposition of new techniques, this should be relegated to an appendix. If your choice of topic is mainly theoretical then your paper can contain a longer exposition in the main body of the paper.
- They may reasonably include a critical comparison of alternative techniques on a particular specification, and/or presentation of a number of alternative specifications against a particular benchmark (such as a set of nested hypotheses).
- The preferred format for the paper is that of a journal article in a high-quality journal. That is, the paper should have an abstract, an introduction stating the question of interest or hypothesis to be tested, a literature review, a section describing the methodology and data, a section presenting and discussing the empirical results, and a conclusion.
- The grading of the paper will be 1/5 based on the presentation of the problem of interest and the overall literature, 1/5 based on the explanation of econometric techniques, and 2/5 empirical part (data issues and replications), 1/5 based on the overall quality of the work (well written with clear exposition, good use of tables, graphics, etc.).
- Create a folder in Dropbox for your group and share the link with me so that I can download everything from there or send me everything in a single zip file. The folder must contain:
  - pdf of your term paper

  - latex files of your paper so that I can simply copy-paste to Overleaf and comment in there on your work
  - data files
  - documentation explaining the data files
  - replication files, i.e. `R` files. This part is important: it's your responsibility to make sure that your results can be easily replicated and the best way to test this is to try to replicate the results on a different computer.

- Research projects are due Thursday 10 May, which is an absolute deadline. Please take note that no extensions will be granted.

Some Suggested Project Topics

- **Instrumental Variables**:

  1. **Economic Development and Institutions**
     (a) Acemoglu, D., Johnson, S. and Robinson, J. A. (2001), The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review*, 91, 1369-1401.
     (b) Acemoglu, D., Johnson, S. and Robinson, J. A. (2005), Institutions as a Fundamental Cause of Growth. In: P. Aghion and S. N. Durlauf, eds, *Handbook of Economic Growth*, Volume 1A, Elsevier Science, Amsterdam, The Netherlands, 386-454.

  2. **Returns to Schooling**
     (a) Card, D. (1995), Using Geographical Variation in College Proximity to Estimate the Return to Schooling. In: L. N. Christofides, E. K. Grant and R. Swidinsky, eds, *Aspects of Labour Market Behaviour: Essays in Honour of John Vanderkamp*, University of Toronto Press, Toronto, Canada, 201-222.
     (b) Card, D. (1999), The Causal Effect of Education on Earnings. In: O. Ashenfelter and D. Card, eds, *Handbook of Labor Economics*, Volume III, Part A, North-Holland, Elsevier, Amsterdam, The Netherlands, 1801-1863.

- **Generalized Method of Moments**

  1. **GMM Estimation of Nonlinear Rational Expectations Models**
     (a) Hansen, L. P. (1982), Large Sample Properties of Generalized Method of Moments Estimators, *Econometrica*, 50, 1029-1054.
     (b) Hansen, L. P. and Singleton, K. (1982), Generalized Instrumental Variables Estimation of Nonlinear Rational Expectations Models, *Econometrica*, 50, 1269-1286.
     (c) Parker, J.A. and Preston, B. (2005) Precautionary saving and consumption fluctuations, *American Economic Review*, 95, 1119-1143.

- **Time Series**

  1. **Unit Root and Macro-economic Time Series**
     (a) Nelson, C. R. and Plosser, C. I. (1982), Trends and Random Walks in Macroeconomic Time Series: Some Evidence and Implications, *Journal of Monetary Economics*, 10, 139-162.
     (b) Phillips, P. C. B. and Perron, P. (1988), Testing for a Unit Root in Time Series Regression, *Biometrika, 75, 335-346.*

  2. **The Purchasing Power Parity Puzzle**
     (a) Taylor, A. M. and Taylor, M. P. (2004), The Purchasing Power Parity Debate, *Journal of Economic Perspectives, 18, 135-158.*
     (b) Rogoff, K. (1996), The Purchasing Power Parity Puzzle, *Journal of Economic Literature, 34, 647-668.*

  3. **Inflation Persistence**
     (a) Fuhrer, J. and Moore, G. (1995), Inflation Persistence, *Quarterly Journal of Economics, 110, 127-159.*
     (b) Pivetta, F. and Reis, R. (2007), The Persistence of Inflation in the United States, *Journal of Economic Dynamics and Control, 31, 1326-1358.*