

2945603 Advanced Econometrics (3 credits)

Pre-requisite: one statistics course and some knowledge of matrix algebra

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Course Objective:

The course is meant to introduce advanced econometrics tools beyond the “Basic Statistics” at the bachelor’s degree level. It is aimed to prepare students for Master’s degree level empirical research. The course will emphasize on the model formulation, estimation methods and interpretation rather than on theoretical proofs. Although it will not be emphasized on the mathematical proofs of econometric theories, the students are expected to have good understanding of basic calculus and matrix algebra. It is the students’ responsibility to make sure that they have enough pre-requisite for the course. Only brief reviews of the pre-requisite statistics will be given.

Course Description:

The topics to be covered can be separated into four(4) parts. The first part will be the review of Least Square method in Regression Analysis. Assuming that the students will have good understanding of the single-equation linear model estimation and inference, the first part will cover a brief review of Uni-variate Statistics, Bi-variate Statistics and Multi-variate Statistics, the Least Square Method and its related statistical inference. The second part will aim at other estimation methods, such as, GMM and Maximum Likelihood. The third part is to deal with the estimation of multiple-equation models. The last part is mainly Time Series Analysis.

Reading Texts:

- [1] Gujarati, D.N., Basic Econometrics (4th edition), McGraw-Hill, 2003
- [2] Enders, W., Applied Econometric Time Series, John Wiley, 1995
- [3] Greene, W., Econometric Analysis, 2002 (more advanced text)
The sixth edition (2008) is now available at the bookstores.
- [4] EViews User’s Guide or Help within EViews program.

Econometric Software:

There are quite a few statistical/econometric software packages available in the market (e.g., EViews, SAS, SPSS, RATS). **EViews** has been chosen for this course. Note that EViews User’s Guide and Help within the EViews program are parts of the reading assignment. EViews will be demonstrated in class when needed. However, it is students' responsibility to learn how to use EViews as all the exams will be based on the results of EViews runs.

Grading Policy:

First in-class exam	50% (date to be announced)
Second in-class exam	50% (date to be announced)

Course Outline:

Week#	Topic#	Description	[text]chapter(page#)
0	0.1	Matrix Algebra	[1]App.B(913-925),[4]App.A(803-844)
1	0.2	Uni-variate Statistics	[1]App.A(869-912),[4]App.B(845-876)
	0.3	Bi-variate Statistics	[1]chs.1-5(15-163)
2	0.4	OLS Estimation of CLR Models	[1]ch.7(202-247)
	1.1	Matrix Approach of OLS	[1]App.C(926-958),[4]ch.2-3(7-40)
3	1.2	Inference of OLS estimation	[1]ch.8(248-279),[3]ch.4-6(41-115)
4	1.3	Dummy Independent Variables	[1]ch.9(297-333)
5	1.4	Multicollinearity	[1]ch.10(341-386)
	1.5	Heteroskedasticity	[1]ch.11(387-440),[4]ch.11(215-249)
6	1.6	Model Misspecification and Selection Criteria	[1]ch.13(506-560),[4]ch.7-8(116-190)
	2.1	IV and GMM Methods	[4]ch.5(65-92),ch.18(525-557)
7	2.2	Panel Data Regression Models	[1]ch.16(636-655),[4]ch.13(283-339)
8		*****Midterm Exam*****	
9	2.3	Maximum Likelihood	[1]ch.4 (112-118),ch.7(246), [1]ch.8(294-296),[4]ch.17(468-524)
	2.4	Logit and Probit Models	[1]ch.15(580-635),[4]ch.21(663-755)
10	3.1	Introduction to Simultaneous-Equation Models	[1]ch.18(717-734),[4]ch.14(339-377)
	3.2	Identification Problem	[1]ch.19(735-761),[4]ch.15(378-424)
	3.3	SEM Estimation: ILS, SURE, GMM	[1]ch.20(762-785)
11	4.1	Difference Equation	[1]ch.21(792-796),[2]ch.1(1-61)
	4.2	ARIMA Models	[1]ch.22(835-848),[2]ch.2(63-134)
12	4.3	Unit Root Tests	[1]ch.21(796-821),[2]ch.4(211-267)
	4.4	Serial Correlation	[1]ch.12(441-505),[4]ch.12(250-282)
13	4.5	ARCH Models	[1]ch.22(856-865),[2]ch.3(135-210)
14	4.6	VAR Representation	[1]ch.22(848-855),[2]ch.5(269-313)
15	4.7	Cointegration and ECM	[1]ch.21(822-834),[2]ch.6(355-418)
	4.8	ARDL Models	[1]ch.17(687-696),[4]ch.19(558-607)
16		*****Final Exam*****	