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ECON 4160

Econometrics – Modeling and systems estimation

TEACHING PLAN Autumn 2014

Lectures and computer classes:

Regular time and place:

Lectures: Monday 14:15-16:00, ES Auditorium 2

Computer Class: Friday 8:15-10:00, HH 035, PC-Lab,

First lecture, Monday 18 August 18

First computer class, Friday, 29 August

Seminars:

First seminar: Week 36 (3 September and 4 September. Schedule: See the official web page.

Main references (syllabus)

Hendry, D.F. and B. Nielsen, *Econometric Modelling. A Likelihood Approach*, 2007, Princeton University Press.

Davidson, R. and J.G. MacKinnon, *Econometric Theory and Methods*, 2004. Oxford University Press

Supplementary texts in the form of handouts will be posted on the course web-page during the semester

Norwegian speaking students may benefit from also reading: G. Bårdsen and R.

Nymoen: *Videregående økonometriske emner*, Fagbokforlaget, 2014, kapitlene 1, 2.1-2.4, 3, 4, 5.4, 5.5, 5.6.a, 6.3.a, 6.4.a, 6.5, 7.1-7.6, 8, 10.1-10.4 and *Innføring I økonometri*, Fagbokforlaget, 2011, kapitlene 4 (*Statistisk metode*) and 6 (*Sannsynlighetsmaksimering og momentmetoden*).

Some topical lectures notes are noted below, in and a few more are likely to be added *en route*.

Lectures and computer classes, overview

Week	Lecture	Computer Class	Seminars
34	#1 Mon 18/8		
35	#2 Mon 25/8		
35	#3 Fri 29/8	#1 Fri 29/8	
36			#1 Wed 3/9 and Thu 4/9
37	#4 Mon 8/9	#2 Fri 12/9	
38	#5 Mon 15/9		#2 Wed 17/9 and Thu 18/9
49	#6 Mon 22/9	#3 Fri 26/9	#3 Wed 24/9 and Thu 25/9
40			
41	#7 Mon 6/10	#4 Fri 10/10	
42	#8 Mon 13/10		#4 Wed 15 /10 and Thu 16/10
43	#9 Mon 20/10	#5 Fri 24/10	
44	#10 Mon 27/10		#5 Wed 29 /10 and Thu 30/10
45	#11 Mon 3/11	#6 Fri 7/11	
46	#12 Mon 10/11		#6 Wed 12 /11 and Thu 13/11
47	#13 Mon 17/11		

Plan for lectures and computer classes

The details may change when the course gets under way (information will then be given in the class and on the web-page).

Lecture 1 , Monday 18 August : Review of maximum likelihood estimation and of likelihood based inference, and the econometric specification of some simple and useful models. Introduction to different concepts of exogeneity, including weak exogeneity, strong exogeneity and super exogeneity.

HN Ch 1-5, DM Ch 10.1-10.5 (BN (2011), Kap. 6, BN (2014), Kap 4):

Lecture 2 , Monday 25 August : Introduction to matrix algebra for regression models and review of the multiple regression model. Frisch-Waugh-Lovel theorem. LR, Wald and Lagrange multiplier tests.

HN Ch 6-8, DM Ch 1.1-1.4, 2, 3 (BN (2014): Kap 2). Lecture Note 1 (by RNy). Lecture note 2 (by RNy).

Computer Class 1, Friday 27 August: Introduction to OxMetrics. Data input and variable transformations. Estimation and mis-specification testing of simple (cross-section) regression models in OxMetrics-PcGive. Show consistency of the OLS estimator under standard assumptions by Monte Carlo simulations. Documenting your work: alg-files and batch-files. To familiarize yourself with Monte Carlo simulation, you may benefit from reading HN Ch 9, Ch 18.1-18.2 and/or the section on *Simulating Econometric Models* in Ch. 1 in DM and Ch. 3.6 and 3.7 in DM.

Lecture 3, Friday 29 August: The Delta-Method for estimation of derived parameters. GLS (single equation) and SURE (systems of regression equations) estimators. HN Ch 9,10. DM Ch 7.1-7-5, 12.2 (BN (2011) Kap 4.4.5, BN (2014) Kap 2.11).

Lecture 4 , Monday 8 September : Empirical models and modelling. Autoregressions, and stationarity. HN Ch 11, 12, DM Ch 13.1-13.3 (BN (2011), Kap 10, BN (2014): Kap 6, 7.1-7.4).

Computer Class 2, Friday 12 September: Non-linear least squares in OxMetrics-PcGive. Show bias of coefficient on lagged dependent variable in AR(1) -- the Hurwitz bias. Recursive estimation and testing of coefficient stability. Encompassing tests in Oxmetrics. Specification and estimation of VAR models in OxMetrics/PcGive. Reading material: HN Ch 13, 14, Ch 18.1-18.3. DM, Ch 6.

Lecture 5: Monday 15 September:

Mis-specification analysis in time series models. The vector autoregressive model, VAR. Weak exogeneity. The distributed lag autoregressive model and related single equation models (model typology).

HN: Ch 13, 14. DM: Ch 3.6-3.7. (BN (2011): Kap 8, 10. BN (2014): Kap 7.5-7.8). Lecture note 3 and Lecture note 4 (by RNy)

Lecture 6: Monday 22 September:

General to specific modelling (GETS) and automatic model selection, basic concepts and theory.

HN: Ch. 19.1-19.7. DM: CH 13.7.

Computer Class 3, Friday 26 September: Illustrate size of finite sample bias of coefficients in ARDL models by Monte Carlo simulation. Mis-specification testing of linear dynamic single equation models in Oxmetrics-PcGive (both single equation and vector versions).

More about the dynamic econometric regression model in a system context. Conditional models and marginal models. Single equation dynamic model typology (ARDL, ECM etc). Pre-determinedness and Granger-causality. Dynamic multipliers in ARDL models.

Estimating the VAR. Examples of tests for different concepts of exogeneity. Manual and automatic GETS modeling in Oxmetrics-PcGive.

Reading material: HN: 13, 14, DM Ch. 12.4-12.5, 13.1-13.4

Lecture 7: Monday 6 October

Identification and estimation of structural equations and models.

HN: Ch 15, DM: Ch 8,9, 12.4-12.5. (BN (2011): Kap 9, BN (2014): Kap 3,7.9-7.11).

Computer Class 4, Friday 10 October: Show bias of OLS estimator when one of the explanatory variables is an endogenous variable by MC simulation. IV estimation in OxMetrics PcGive. The order and rank condition for identification. Test of overidentifying restrictions. Show that IV estimator is consistent when one explanatory variable is endogenous. FIML estimation in OxMetrics PcGive

Lecture 8 Monday 13 October Non-stationary time series.

HN: Ch 16. DM: Ch 14.1-14.4, (BN (2014) Kap 10)

Lecture 9 Wednesday 20 October: Cointegration.

HN: Ch 17, 19.7. DM: Ch 14.4-14.7 (BN kap 11)

Lecture 10 Wednesday 20 October: Cointegration.

HN: Ch 17, 19.7. DM: Ch 14.4-14.7 (BN kap 11)

Computer class 5, Friday 24 October Tests for parameter stability. Testing for unit roots and cointegration in OxMetrics. Modelling dynamic econometric systems in OxMetrics.

Lecture 11 Monday 3 November: Structural breaks

HN: Ch 20. (BN (2014 Kap 10.1)

Computer class 6, Friday 7 November Testing unit roots and cointegration in OxMetrics. Modelling dynamic econometric systems in OxMetrics (cont'd)

Lecture 12 Monday 10 November: SVAR

(BN (2014), Kap 7.11)

Lecture 13 Monday 17 November: Forecasting

HN: Ch 21.