Economic and Financial Studies
Economics Department

ECON332 – Econometric Models

Second Semester, 2008

UNIT OUTLINE

ECON332 - ECONOMETRIC MODELS

Second Semester, 2008

Unit Outline

The purpose of this unit is to provide economics and econometrics students with an overview of the major types of economy-wide macroeconometric models used in practice. At least two major Australian macroeconometric models are discussed in detail.

Topics include: A taxonomy of economy-wide macroeconometric models from Klein to Johansen; the solution of linear and non-linear systems; multiplier analysis in linear and non-linear models; model simulation; policy analysis; the Orani model; the Monash Model; the Murphy model; the Access Economics Model (AEM).

Familiarity with matrix algebra is desirable, but not essential. Model simulations are implemented using an econometric computer package.

Prerequisites

Students must have passed

1.   ECON200 or ECON201, and

2.   ECON141, or 3 credit points in the range STAT270 - STAT272.

ECON332 Public Web Page

The web page for this unit can be found at: http://online.mq.edu.au/pub/ECON332/
This web address is case sensitive. Students enrolled in ECON332 can log on to the Blackboard web-site for ECON332 from the ECON332 Public Web Page.

References

References for topics that **may** be covered in the course are given below. However, it is not intended that students should attempt to assimilate the material in these references independently of guidelines which will be laid down in the lectures.

Core References

(1)   D.W. Challen and A.J. Hagger, *Macroeconometric Systems: Construction, Validation and Applications,* Macmillan, 1983.

 (2)   B.R. Parmenter, "Inter-Industry Analysis: the ORANI model of Australia's Industrial Structure", Ch. 5 of Webb and Allan (eds.), *Industrial Economics: Australian Studies*, George Allen & Unwin, 1982.

(3)   Murphy, C.W.
        The Macroeconomics of a Macroeconometric Model
        ECONTECH, 1990

(4)   Murphy, C.W.
        The Model in Detail
        ECONTECH, 1990

(5)   Murphy, C.W.
        Murphy Model of the Australian Economy
        User's Guide for version 2.0
        ECONTECH, 1990

(6)   Powell, A.A. & C.W. Murphy
        INSIDE A MODERN MACROECONOMETRIC MODEL:
        A GUIDE TO THE MURPHY MODEL
        Springer-Verlag, 1995

References for Preliminary and Background Reading (See page 6.)

(7)   Pindyck, R.S. and R.L. Rubinfeld
        ECONOMETRIC MODELS AND ECONOMETRIC FORECASTS, Third Edition,
        McGraw-Hill, 1991, chapters 12 and 13, pp. 331-412.

(8)   Wynn, R.F. & K. Holden
        AN INTRODUCTION TO APPLIED ECONOMETRIC ANALYSIS
        The Macmillan Press, 1974

Introductory Matrix Algebra References (See page 6.)

(9)   James D.E. & C.D. Throsby, Chapters 14 & 15, pages 191-249, and Appendix C, pages 303-311, INTRODUCTION TO QUANTITATIVE ANALYSIS IN ECONOMICS, Wiley, 1973

(10)   O'Brien T., D.E. Lewis & J.F. Guest, Chapter 6, pages 94-154, MATHEMATICS FOR BUSINESS AND ECONOMICS, Harcourt Brace Jovanovich, 1989

Additional References

(11)   Intriligator, M.D. (1978), *Econometric Models, Techniques and Applications*, North-Holland.

(12)   L.R. Klein and R.M. Young, *An Introduction to Econometric Forecasting and Models*, Lexington, 1980.

(13)   Department of the Treasury, *The NIF-10 Model of the Australian Economy*, Aust. Govt. Publishing Service, 1981.

(14)   Kmenta, J. and Ramsay, J.B. (eds), (1981), *Large-Scale Macro-Econometric Models*, North-Holland.

(15)   P. Arestis and G. Hadjimatheou, *Introducing Macroeconomic Modelling: An Econometric Study of the United Kingdom*, Macmillan, 1982.

(16)   P.B. Dixon, B.R. Parmenter, J. Sutton and D.P. Vincent, *ORANI: A Multisectoral Model of the Australian Economy*, North-Holland, 1982.

(17)   Wallis, K.F. et al., *Models of the UK Economy*, Vols 1 (1984), 2 (1985), 3 (1986) and 4 (1987), Oxford University Press.

(18)   Fair, R.C. (1984) *Specification, Estimation and Analysis of Macroeconometric Models*, Harvard University Press.

(19)   J. Piggott and J. Whalley (eds.), *New Developments in Applied General Equilibrium Analysis*, Cambridge University Press, 1985.

(20)   G. Keating, *The Production and Use of Economic Forecasts*, Methuen & Co., 1985.

(21)   P.B. Brain, *The Microeconomic Structure of the Australian Economy*, Longman Cheshire, Melbourne, 1986.

(22)   C.W. Murphy et al, *A Macroeconometric Model of the Australian Economy for Medium-Term Policy Analysis, Office of EPAC Technical Paper No. 2*, Canberra Printing and Publishing, 1986 (referred to as AMPS).

(23) Griliches, Z. and Intriligator, M.D., (eds), (1986), Handbook of Econometrics, Vol. 3, North-Holland.

(24) Cuthbertson, K., & M.P. Taylor, MACROECONOMIC SYSTEMS, Basil Blackwell, 1987

(25) Burns, M. and Murphy, C.W., (eds), (1988), "Macroeconomic Modelling in Australia", *Australian Economic Papers*, Special Issue.

(26) McKibbon W.J. & J.D. Sachs, GLOBAL LINKAGES: MACROECONOMETRIC INTERDEPENDENCE AND COOPERATION IN THE WORLD ECONOMY, The Brookings Institution, 1991

(27) Wallis, K.F., On Macroeconomic Policy and Macroeconometric Models, THE ECONOMIC RECORD, Vol. 69, No 205, June 1993, pp. 113-30.

(28) Hargreaves, C., (Editor), A COMPARISON OF ECONOMY-WIDE MODELS OF AUSTRALIA, EPAC Commission Paper No. 2, Australian Government Publishing Service, 1994

(29) Breece, J.H., K.R. McLaren, C.W. Murphy and A.A. Powell, Using the Murphy Model to Provide Short-run Macroeconomic Closure for ORANI, THE ECONOMIC RECORD, Vol. 70, No 210, September 1994, pp. 292-314.

(30) THE ACCESS ECONOMICS MACRO MODEL, Version 3 Access Economics Pty. Ltd., 1995.

(31) Powell, A.A., From Dombusch to Murphy: Stylized Monetary Dynamics of a Contemporary Macroeconometric Model, paper presented at the Econometrics Conference, Monash University, July 1995.

(32) TRYM, THE TREASURY MACROECONOMIC MODEL OF THE AUSTRALIAN ECONOMY, Australia Bureau of Statistics, 1996

(33) Whiteley, J.D., A COURSE IN MACROECONOMIC MODELLING AND FORECASTING, Harvester/Wheatstead, London Business School

(34) Klein, L.R., A. Welfe and W. Welfe, PRINCIPLES OF MACROECONOMETRIC MODELING, North-Holland, 1999

Preliminary Reading

The book by Challen & Hagger, the first item on the list of references, used to be a textbook for ECON332. It is now somewhat dated, and the unit now places greater emphasis on the actual models themselves than is the case in the book. (It is now out of print.) However, chapter one in Challen & Hagger has a very good overview of economy wide models classified into various types. This classification is still relevant and an interesting way of looking at the whole area.

Chapters 12 & 13 of the book by Pindyck R.S. and R.L. Rubinfeld, ECONOMETRIC MODELS AND ECONOMIC FORECASTS, Third Edition, McGraw-Hill, 1991, pp. 331-412, has a very good discussion of simulation based on econometric models.

Policy simulation using economy wide models is discussed extensively in ECON332. Along with forecasting, policy simulation is the major reason why economy wide models are constructed. The policy simulation aspects are more important and arguably more reliable than the forecasting aspects, but the two are very closely related.

Another very good introductory book is the book by Wynn R.F. and K. Holden (listed in the references, on page 4). This book was written in 1974, so it also is dated, but it has an extremely good introduction to economy wide econometric modelling. The entire book is worth reading. The first half of the book is devoted to particular sectors of the economy, Production, Investment and Wages and Prices. The second half, i.e. chapters 5 & 6, is devoted to early examples of major economy wide models, forecasting and multiplier analysis. Multiplier analysis is more general than policy simulation and is also discussed extensively in ECON332. If you don't have time to read the whole book, it is recommended that you read at least chapters 5 & 6.

Finally, if you need a basic introduction to Matrix Algebra, the last half (pages 189-314) of the book by D.E. James & C.D. Throsby, INTRODUCTION TO QUANTITATIVE METHODS IN ECONOMICS, is very good. Matrix Algebra is not essential for ECON332 but quite a lot of the literature in econometric modelling uses matrix algebra, so it is helpful to have had some exposure to it. Matrix algebra is avoided as much as possible in lectures and tutorials, and it is not examinable in ECON332, but, unfortunately, it is used in some of the key references because it is a very efficient technique for dealing with linear systems of equations. The major focus in ECON332 is not on linear systems of equations, it is on non-linear systems of equations, but it is often useful to discuss various aspects of systems modelling in the context of a linear system before moving on to the discussion of those aspects in the context of non-linear systems. This is the approach taken in ECON332.

Class Arrangements

There will be a three hour lecture/tutorial each week. Tutorials will normally be conducted in the last hour, but not necessarily.

In weeks 2, 5 and 8 a computing practical will replace the lecture/tutorial during the last hour, if required.

Lecture/Tutorials	Thursday 6 - 9 pm, E6A-108
Computing Practicals	Thursday 8 - 9 pm, E4B-111
	Weeks 2, 5 and 8 (if required)

Workload

Students are expected to devote at least nine hours each week to ECON332, including attendance at Lectures, Tutorials and Computing Practicals.

Topics

Weeks 1 − 6	Multiplier Analysis in Non-linear models
Weeks 7 − 9	The Murphy Model (and the Access Economics AEM Model)
Weeks 10 − 12	The Orani Model (and the MONASH Model)
Week 13	Exam Briefing and Review

Assessment

NOTE: It is the policy of the Economics Department that students enrolled in a unit offered by the Economics Department must pass the final examination to pass the unit.

      (a)   A three hour written end-of semester examination

      (b)   A major (computer-based) project.

The end-of-semester examination is worth 70% of the overall assessment.
The project has a weight of 30%.

The project **must** be submitted in the ECON332 box located in the EFS Resource and Information Centre (ERIC), in E4B-106.   Do NOT submit the project directly to the lecturer. Do **NOT** leave the project under the lecturer's door.

 The deadline for submission of the project is Friday 7th November, 4:00 pm.

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APPENDIX

Format of the final (End-of-Semester) Examination
Standardised Numerical Grades (SNGs)
Plagiarism
University Policy on Examination Attendance
Supplementary Assessment
Special Consideration
Appeals by Students Against Grades
Student Support Services

Format of the final (End-of-Semester) Examination

The examination will consist of five (5) questions. Students are required to attempt each question. There is no choice.

Questions are of equal value.

Answers are to be in essay form. Students may use equations and mathematical arguments in their answers if they wish, but they will not be required to produce mathematical proofs or derivations.

SHAZAM computing commands and procedures are not examinable in the End-of-Semester Examination.

The following is a list of major examinable topics:

1.   The Gauss-Seidel procedure for solving a nonlinear system of equations.

2.   The Newton-Raphson procedure for solving a nonlinear system of equations.

3.   Multiplier Analysis in linear econometric systems.

4.   Multiplier Analysis in nonlinear econometric systems.

5.   The (stylised) Murphy model : structure, features, characteristics, uses, limitations, advantages and disadvantages.

6.   The (stylised) Orani model : structure, features, characteristics, uses, limitations, advantages and disadvantages.

Standardised Numerical Grades

The Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG).

On occasion your raw mark for a unit (i.e. the total of your marks for each assessment item) may not be the same as the SNG which you receive. Under the senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should receive similar results.

It is important that you realize that the policy does not require that a minimum of students be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain their actions if more than 20% of students fail in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark.

For an explanation of the policy see
http://senate.mq.edu.au//rules/Guidelines2003.doc or
http://senate.mq.edu.au/rules/detailedguidelines.doc.

Plagiarism

The University defines plagiarism in its rules: 'Plagiarism involves using the work of another person and presenting it as one's own." Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the Macquarie University *2008 Handbook of Undergraduate Studies* (pages 47-48) or on the web at:
http://www.student.mq.edu.au/plagiarism/

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

University Policy on Examination Attendance

Students are expected to attend the End-of-Semester examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations. The Draft and Final examination timetable will be available at:
http://www.timetables.mq.edu.au/exam

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances a student may apply for Special Consideration. Information about unavoidable disruption and the Special Consideration process is available at:
http://www.reg.mq.edu.au/Forms/APSCon.pdf

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. Supplementary examinations conducted by the Division of Economic and Financial Studies for first semester units are normally scheduled during the period between the release of the examination grades and the start of the second semester.

You are advised that it is Macquarie University policy not to set early examinations for individuals or groups of students. All students are expected to ensure that they are available until the end of the teaching semester; that is, until the final day of the official examination period.

Supplementary Assessment

Students who are prevented by circumstances beyond their control from attending the End-of-Semester Examination, or whose performance in the examination is affected by circumstances beyond their control, may submit a request for special consideration (see below) to be allowed to sit for a Supplementary End-of-Semester Examination, or to have these circumstances taken into account in determining the student's grade. **Note**: Minor illnesses are **NOT** sufficient grounds for being granted special consideration.

Special Consideration

The rules and procedures governing Special Consideration are set out on page 44 and page 98 of the Macquarie University *2008 Handbook of Undergraduate Studies*. It is the responsibility of all students enrolled in ECON332 to ensure that they have read and understand the rules and procedures governing Special Consideration.

Appeals by Students Against Grades

The rules and procedures governing Appeals by Students Against Grades are set out on pages 45-46 and page 101 of the Macquarie University *2008 Handbook of Undergraduate Studies*. It is the responsibility of all students enrolled in ECON332 to ensure that they have read and understand the rules and procedures governing Appeals by Students Against Grades.

Student Support Services

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at http://www.student.mq.edu.au.