ECOM30004
Time Series Analysis & Forecasting

SUBJECT GUIDE

Semester 2, 2013

Prepared by
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Department of Economics
Faculty of Business and Economics
Subject Outline

Introduction

Welcome to Time Series Analysis and Forecasting. In this course you will learn about the core concepts of time series regression analysis and how time series models can be used to forecast economic and financial data.

Subject Aims

This subject introduces current forecasting techniques used in economics and finance. The emphasis is on applications, focusing on model building and forecast evaluation. Topics will include:

- Structural break analysis
- ARMA and seasonal ARMA models
- Unit root tests and ARIMA models
- ARCH models
- VAR and Structural VAR models
- Cointegration and VECMs

All estimations and simulations are to be computed by EViews.

Prescribed References

There is no specific prescribed reading for this course, although you may find the following text useful as a supplement to the course materials:


Learning Outcomes

Subject Objectives

To view the subject objectives and the generic skills you will develop through successful completion of this subject, please see the University Handbook:


To view the learning goals, generic skills and graduate attributes for your degree, please locate the University Handbook entry for your degree at: http://handbook.unimelb.edu.au/
Generic Skills

In this subject you will have the opportunity to develop important generic skills. These include:

– Evaluation of ideas, views and evidence
– Synthesis of ideas, views and evidence
– Strategic thinking
– Critical thinking
– Accessing economic and other information
– Summary and interpretation of information
– Application of Windows software
– Statistical reasoning
– Problem solving skills
– Written communication

Awareness Issues

At a broader level, studying this subject will increase your awareness of issues such as:

– The issues involved in data analysis and the presentation of statistical results
– The validity of reported statistics and their interpretation

Prerequisites

ECOM30001/90001 Basic Econometrics; or

ECOM30002/90002 Econometrics; or

MAST20004 Probability and MAST20005 Statistics

Academic Staff Contact Details

Subject Coordinator/Lecturer Contact Details

Your coordinator/lecturer for ECOM30004 is Matthew Greenwood-Nimmo

Email: mgreenwood@unimelb.edu.au

Room: 312 FBE Building

Phone: 03 8344 5354

Consultation Hours: Tuesday 12:00pm – 2:00pm
**Tutor Contact Details**

Tutor: David Moreton

   Email: dmoreton@unimelb.edu.au

   Room: 317 FBE Building

   Phone: N/A

   Consultation Hours: Wednesday 1:00pm – 2:00pm

Tutor: Catherine Tanuwidjaja

   Email: ctanuwidjaja@unimelb.edu.au

   Room: 353 FBE Building

   Phone: N/A

   Consultation Hours: Thursday 12:00pm-1:00pm

**Email Protocol**

Please note that we are only able to respond to student emails coming from a University email address. Please do not use personal email addresses such as Yahoo, Hotmail or even business email addresses. Emails from non-University email addresses may be filtered by the University’s spam filter, which means that we may not receive your email. All correspondence relating to this subject will only be sent to your University email address. Note that you must first activate your University email address before you can send or receive emails at that address. You can activate your email account at this link: [http://accounts.unimelb.edu.au/](http://accounts.unimelb.edu.au/).

While academic staff endeavor to address queries received via email, it is more appropriate to resolve substantive questions during lectures and tutorials and during normal consultation hours. With this in mind, we encourage students to attend all lectures and tutorials and to familiarise themselves with the consultation hours offered by the lecturers and tutors in this subject.

Furthermore, where possible, students are encouraged to post questions and comments in the Discussion Forum on the LMS so that everyone in the group can benefit from the responses.
Lectures and Tutorials

Lecture Times

Tuesday  2:15 – 3:15pm    Medical-Frederic Wood Jones Theatre
Friday   9:00 – 10:00am   MSLE-Lower Theatre

Lecture Participation Requirements

Students are expected to attend all lectures and to keep up-to-date with the work requirements of the course.

Lecture Schedule

This section provides a timetable of lectures for the entire semester.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date Commencing</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>29-07-2013</td>
<td>Course overview &amp; the nature of time series analysis</td>
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<tr>
<td></td>
<td></td>
<td>Modelling trend &amp; seasonality</td>
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<tr>
<td>2</td>
<td>5-08-2013</td>
<td>Stationarity, autocorrelation and partial autocorrelation</td>
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<td>Properties of an AR(1) model I: Stationary AR(1) process</td>
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<tr>
<td>3</td>
<td>12-08-2013</td>
<td>Properties of an AR(1) model II: Random walk process</td>
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<td></td>
<td>Properties of an MA(1) model</td>
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<tr>
<td>4</td>
<td>19-08-2013</td>
<td>ARMA models: Lag operator &amp; eigenvalues analysis</td>
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<td></td>
<td>Seasonal ARMA &amp; ARIMA models</td>
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<tr>
<td>5</td>
<td>26-08-2013</td>
<td>Unit root test I: Concept &amp; test strategies</td>
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<td>Unit root test II: Structural breaks in the unit root test</td>
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<tr>
<td>6</td>
<td>2-09-2013</td>
<td>Forecasting &amp; forecast evaluation</td>
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<td>ARCH models I: Concept</td>
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<td>7</td>
<td>9-09-2013</td>
<td>ARCH models II: Symmetric volatility models</td>
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<td>7</td>
<td>16-09-2013</td>
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<td>8</td>
<td>16-09-2013</td>
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<td>9</td>
<td>23-09-2013</td>
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<td>10</td>
<td>7-10-2013</td>
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<td>11</td>
<td>14-10-2013</td>
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<tr>
<td>12</td>
<td>21-10-2013</td>
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**Lecture Slides**

Lecture slides will be placed on the LMS page for this subject prior to each lecture. The lecture slides are located under the heading “Lectures”.

**Tutorial Times**

Tutorials will commence in the second week of teaching. Please refer to the LMS for details of the date, time, and location of tutorials.

**Tutorial Participation Requirements**

Students are expected to attend and actively participate in all tutorials and to keep up-to-date with the work requirements of the course. Solutions to tutorial problems sets will be made available after the tutorials via the LMS.

**Tutorial Schedule**

This section provides details of material that is covered in tutorials.
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<thead>
<tr>
<th>Week</th>
<th>Tutorial Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>N/A</td>
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<tr>
<td>2</td>
<td>Modelling the deterministic structure of a variable</td>
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<tr>
<td>3</td>
<td>Correlograms and the stochastic structure of a variable</td>
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<tr>
<td>4</td>
<td>AR and MA processes</td>
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<td>5</td>
<td>Stationary and non-stationary processes</td>
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<td>6</td>
<td>Building a valid univariate model</td>
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<td>7</td>
<td>Dickey Fuller test for a unit root</td>
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<td>8</td>
<td>Forecasting share prices and volatility</td>
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<td>9</td>
<td>Hodrick-Prescott filtering</td>
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<tr>
<td>10</td>
<td>Interpreting a VAR model</td>
</tr>
<tr>
<td>11</td>
<td>The cointegrating VAR model</td>
</tr>
<tr>
<td>12</td>
<td>Johansen test for cointegration</td>
</tr>
</tbody>
</table>

**Using Lecture Capture (Echo 360)**

Audio recordings of lectures delivered in this subject will be made available for review in the days following each lecture. Audio recordings of lectures allow you to revise lectures during the semester, or to review lectures in preparation for the end of semester exam.

You can access recorded lectures by clicking on the Lecture Recordings (or similar) menu item in the LMS page for this subject.

To listen to lecture recordings, you must install QuickTime 7 (or a later version) on your computer.

Please note that lecture recordings are not a substitute for attendance; rather they’re designed for revision. On rare occasions the lecture capture system can fail to record the lecture due to technical reasons. In such cases, the lecture recording will not be made available.

**Assessment**

**Assessment Overview**

Your assessment for this subject comprises the following:
Assignment 1

- Presentation requirements: minimum size 12 font and the text must be clearly legible. Submission is to be made online in pdf format. Any graphs or charts should not use colour as assignments will be printed in black and white. Please bear this in mind to ensure that lines or shaded regions can be clearly distinguished in the printed version.

- Maximum word count: nominally 1000 words but no penalty for using fewer words. Penalties may apply for exceeding the word count.

- If necessary, estimation is to be conducted in Eviews.

Assignment 2

- Presentation requirements: minimum size 12 font and the text must be clearly legible. Submission is to be made online in pdf format. Any graphs or charts should not use colour as assignments will be printed in black and white. Please bear this in mind to ensure that lines or shaded regions can be clearly distinguished in the printed version.

- Maximum word count: nominally 1000 words but no penalty for using fewer words. Penalties may apply for exceeding the word count.

- If necessary, estimation is to be conducted in Eviews.

Assignment 3

- Presentation requirements: minimum size 12 font and the text must be clearly legible. Submission is to be made online in pdf format. Any graphs or charts should not use colour as assignments will be printed in black and white. Please bear this in mind to ensure that lines or shaded regions can be clearly distinguished in the printed version.

- Maximum word count: nominally 1000 words but no penalty for using fewer words. Penalties may apply for exceeding the word count.
• If necessary, estimation is to be conducted in Eviews.

Assignment 4

• Presentation requirements: minimum size 12 font and the text must be clearly legible. Submission is to be made online in pdf format. Any graphs or charts should not use colour as assignments will be printed in black and white. Please bear this in mind to ensure that lines or shaded regions can be clearly distinguished in the printed version.

• Maximum word count: nominally 1000 words but no penalty for using fewer words. Penalties may apply for exceeding the word count.

• If necessary, estimation is to be conducted in Eviews.

Final Exam

• The final exam will be held in the examination period and will cover all topics from the course. You are allowed two (2) hours to complete the exam. The time and venue will be announced towards the end of the semester.

Exam Policy

The Faculty requires that you are available for the entire examination period. Supplementary exams will not be provided in cases of absence during the examination period, unless the absence is due to serious illness or other serious circumstances. See the Special Consideration web site for more information:
http://fbe.unimelb.edu.au/csc/assistance/special_consideration

The examination period for this semester is Monday 4 November to Friday 22 November

Using the Assignment Tool

The Assignment Tool allows you to submit your assignment to your lecturer online from home or from any of the student labs on campus.

During the course of the semester, you’ll be asked to submit four assignments in electronic format into the Assignment Tool. You can access the Assignment Tool by clicking on Assignment Tool in the navigation menu from the LMS page for this subject.

A student guide has been prepared on the use of the Assignment Tool. The guide provides instructions on how to submit assignments in hardcopy format. The guide can be downloaded here:

Please note that you are required to keep a copy of your assignment after it has been submitted, as you must be able to produce a copy of your assignment at the request of your tutor or lecturer at any time after the submission due date.
**Plagiarism and Collusion**

Presenting material from other sources without full acknowledgement (referred to as plagiarism) is heavily penalised. Penalties for plagiarism can include a mark of zero for the piece of assessment or a fail grade for the subject.

Plagiarism is the presentation by a student of an assignment identified as his or her own work even though it has been copied in whole or in part from another student’s work, or from any other source (e.g. published books, web-based materials or periodicals), without due acknowledgement in the text.

Collusion is the presentation by a student of an assignment as his or her own work when it is, in fact, the result (in whole or in part) of unauthorised collaboration with another person or persons. Both the student presenting the assignment and the student(s) willingly supplying unauthorised material are considered participants in the act of academic misconduct.


**Penalties for Late Submission and Exceeding Word Limits**

In order to ensure equality for all students, assignments must be completed within specified time limits. Late submissions will attract a marking penalty where approval for late submission has not been given. The maximum permissible extension period is three days. If you require an extension then you should contact the lecturer directly to request that your circumstances be taken into consideration. Unauthorised late submissions will incur a penalty of 20% for each day that passes after the stated deadline. Assignments submitted more than three days after the stated deadline will not be accepted. Assignments that exceed word limits may also attract a marking penalty.


**Special Consideration**

Students who have been significantly affected by illness or other serious circumstances during the semester may be eligible to apply for Special Consideration.

The following website contains detailed information relating to who can apply for Special Consideration and the process for making an application:


**Referencing**

All sources used for a written piece of assessment must be referenced. This is to acknowledge that your material is not based entirely on your own ideas, but is based, in part,
on the ideas, information, and evidence of others. This is desirable as you are attending
University in order to learn from others.

You will be required to use the APA system or Harvard System of referencing. The FBE
Centre for Excellence in Learning and Teaching (CELT) has prepared a booklet for each
system specifically to assist students to reference correctly. Each booklet contains many
examples that will help you when preparing your assignments. The booklets can be found
here:
http://fbe.unimelb.edu.au/__data/assets/pdf_file/0006/647583/Basic_referencing_APA_syste
m.pdf and

It is important that all material you present for assessment is referenced correctly. Material
that has not been referenced correctly may be considered to be plagiarised, and as such may
be penalised. We will also look for evidence that material included in the bibliography has
been used in the assignment. Including references that have not been used may also result in
your assignment being penalised.

Other Subject Resources

The following resources are provided to assist your learning:

Supplementary Readings

Two workbooks originally written for this course by Prof David Harris will be made
available via the LMS as supplementary materials.

You may also find “Applied Econometric Time Series” by Walter Enders to be useful as a
supplementary text (details provided above).

LMS Discussion Board

The Discussion Board for this subject can be accessed via the LMS subject page and allows
you to post messages and read messages at any time. All students are free to communicate
with each other using the Discussion Board by posting, reading, and replying to messages.

The discussion forum is organised into threads (conversations within a topic). Messages are
posted by starting a new thread or replying to an existing posting. To access the Discussion
Board, click on the Discussion Board located in the navigation menu of the LMS page for
this subject.

Always be polite when asking questions or posting replies. Impolite language will not be
tolerated. The lecturer reserves the right to ban students who use inappropriate/impolite
language from using the Discussion Board.
FBE Centre for Excellence in Learning and Teaching

The FBE Centre for Excellence in Learning and Teaching (CELT) provides services and resources to enhance your learning in Business and Economics.

Maximise your academic success by taking part in CELT services that develop:

- Skills in research, referencing and academic writing
- Mastery of different assignment types
- Effective study techniques
- Abilities to learn effectively with your peers
- Transition to the faculty and understanding of academic expectations

The Centre also provides an extensive range of helpsheets that can enhance your academic performance in Business and Economics. These are available online or at the Centre.

Visit the CELT site [www.fbe.unimelb.edu.au/celt](http://www.fbe.unimelb.edu.au/celt) to learn more and get involved.

Past Exams

Past exams are available via the LMS under the heading “Exams”.

Subject Prizes

The Jean Polglaze Memorial Prize will be awarded to the student(s) enrolled on the course who obtain(s) the highest overall mark across all assessment elements. The value of the prize is A$250. All students enrolled on the course, whether at undergraduate, Honours or Masters level will be eligible for consideration. In the event that multiple students achieve the same top mark then the prize will be evenly divided among them.