THE UNIVERSITY OF
NEW SOUTH WALES

Australian School of Business
School of Economics

ECON3206/5206
FINANCIAL ECONOMETRICS

Course Outline

Semester 2, 2009

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1 STAFF CONTACT DETAILS

Lecturer-in-charge: Valentyn Panchenko
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Consultation Times – Tue 10:30-12:00, Wed 10:30-12:00

Tutor: Sviatoslav Gribov, svi.gribov@anu.edu.au

1.1 Communications with staff

Feel free to ask short questions right after the lecture/tutorial and use the consultation times for more elaborate questions. I will regularly respond (within 3 working days) to the questions asked on a specially set-up discussion board on WebCT Vista. Please, read all discussion posts before asking your question, you may find the answer. Please, limit the use of my email. If you a question regarding tutorials, please, contact the tutor.

2 COURSE DETAILS

2.1 Teaching Times and Locations

Lecture: Mon 16:00 - 18:00 Webster Theatre B

Tutorials Start in Week 2.

The Groups and Times are:

ECON3206
Wed 09:00 - 10:00 Law 162
Wed 11:00 - 12:00 Chemical Sc M14
Wed 16:00 - 17:00 Law 163
Wed 17:00 - 18:00 Law 301
ECON5206
Mon 18:00 - 19:00 Quadrangle 1045

2.2 Units of Credit

The course is worth 6 units of credit.

2.3 Summary of Course

This course is concerned with the application of quantitative methods to the study of financial data. It begins by establishing the key empirical characteristics of financial data. These relate to the shape of the empirical distribution for asset returns. We then turn to an examination of the methods that are used to model these regularities. We begin with the linear regression model and discuss its application to tests of the capital asset pricing model (CAPM), the arbitrage pricing model (APT), and the forward market efficiency. Following this, there is a

discussion of the time series methods for modelling stationary data. At this point in the course, you are in a position to learn how to model the volatility in asset return data which is evident for short (weekly or daily) holding periods. Our focus will be on the ARCH/GARCH class of volatility models. This approach is applied to modelling the time-varying risk premium on financial assets and to Value-at-Risk (VaR) calculations which many financial institutions use to assess the risk of their portfolios. We also discuss the "spurious regression" problem which arises in financial applications. This leads to a discussion of non-stationary data and how to model long-run relationships among financial time series. We then discuss techniques of modelling time series more generally, particularly in an error correction framework. Students will be asked to work through a number of questions with a broad range of financial data sets.

2.4 Aims and Relationship to Other Courses

The course aims to provide benefits to students in terms of:

1. Developing their ability to model the volatility in financial data as a means to a more informed assessment of the risk and return associated with different investment strategies.
2. An awareness of the empirical evidence supporting alternative models of asset price determination. Students can then assess their usefulness.
3. Developing their proficiency with the computer skills required to actually model financial data in practice. Students should be proficient in EViews by the end of the course.

This course is offered as part of the economics stream in the B.Com and B.Econ degrees (ECON3206) and M.Com degree (ECON5206).

While a prerequisite for ECON3206 is ECON2206 Introductory Econometrics (or more advanced course in Econometrics or Statistics), it is advised that you take either Statistics for Econometrics or Business Forecasting or Econometric Methods or Financial Economics before this course. The course requires good mathematical skills.

A prerequisite for ECON5206 is ECON5203 Data, Models and Decisions.

2.5 Student Learning Outcomes

On completion of the course, students should be able to:

1. Describe and interpret financial data
2. Describe and critically analyse financial data
3. Apply some of the basic models and theory to financial assets valuation
4. Model the mean behaviour of financial time series.
5. Model the volatility in financial data and perform Value-at-Risk calculations that are used as an input into the financial decision making process.
6. Model the long-run relationships among financial time series.

7. Be proficient at econometric modelling of financial data using the software program EViews, which is widely used in the commercial world
8. Work is a group on a joint project

Graduate Attributes

Course Learning Outcomes	ASB Graduate Attributes
1–8	1. Critical thinking and problem solving
1,2,8	2. Communication
8	3. Teamwork and leadership
1, 2, 3	4. Social, ethical and global perspectives
1–7	5. In-depth engagement with relevant disciplinary knowledge
1–8	6. Professional skills

3 LEARNING AND TEACHING ACTIVITIES

3.1 Approach to Learning and Teaching in the Course

The broad approach to teaching and learning in Financial Econometrics is first to understand the relevant econometric technique at a reasonable theoretical level and then to apply that technique to real world financial data. An understanding of econometric method at a minimum level of theory is crucial in order to apply the econometric methods to real world data sets in a sensible way.

The philosophy underpinning this course and its Teaching and Learning Strategies are based on "Guidelines on Learning that Inform Teaching at UNSW. These guidelines may be viewed at: www.guidelinesonlearning.unsw.edu.au. Specifically, the lectures, tutorials and assessment have been designed to appropriately challenge students and support the achievement of the desired learning outcomes. A climate of inquiry and dialogue is encouraged between students and teachers and among students (in and out of class). The lecturers and tutors aim to provide meaningful and timely feedback to students to improve learning outcome.

3.2 Learning Activities and Teaching Strategies

The examinable content of the course is defined by the references given in the Lecture Schedule, the content of Lectures, and the content of the Tutorial Program.

Lectures
The purpose of Lectures is to provide a logical structure for the topics that make up the course; to emphasize the important concepts and methods of each topic, and to provide relevant examples to which the concepts and methods are applied.

Tutorials
Tutorials begin in Week 2 and are an integral part of the subject. Tutorial questions/problems will build on the material discussed in class with the lecturer.

Out-of-Class Study
While students may have preferred individual learning strategies, it is important to note that most learning will be achieved outside of class time. Lectures can only provide a structure to assist your study, and tutorial time is limited.

A **recommended learning strategy**, on which the provision of the course materials is based, includes:

1. Skimming the relevant chapter(s) of the text and notes **before the lecture.** This will give you a general idea of the topic area.
2. Attendance at lectures. Here the context of the topic in the course and the important elements of the topic are identified and the relevance of the topic is explained.
3. Detailed reading the relevant chapters of the text and notes.
4. Attending tutorials and attempting tutorial questions **before the tutorial**.

4 ASSESSMENT

4.1 Formal Requirements

In order to pass this course, you must:

- achieve a composite mark of at least 50 out of 100; and
- make a satisfactory attempt at most of assessment tasks (see below).

4.2 Assessment Details

Assessment Task	Weighting	Learning Outcomes assessed	ASB Graduate Attributes assessed	Length	Due Date
In-tutorial tests	15%	1–7	1,2,5,6	30 minutes	Weeks 4, 9, 11
Group Project	15%	1–8	1–6	10 pages	12 October, 2009
Mid-session Exam	20%	1–6	1,2,5,6	2 hours	24 August 2009
Final Exam	50%	1–6	1,2,5,6	2 hours	University Exam Period
	100%				

4.3 In-tutorial tests

There will be 3 written in-tutorial tests in weeks 4, 9 and 11. Students will have 30 minutes to complete each test. The contribution to the final mark will be based only on the 2 best marks out of 3 marks for the in-tutorial tests.

The in-tutorial tests will cover all lecture material prior to the test date, for which there were tutorial sessions. This means week X test covers lecture material of week 1 though week X-2, inclusive. More emphasis will be put on the material which was not tested before, but any earlier material may be included in the test.

Students must sit the in-tutorial tests in the tutorial group to which they have been allocated. No supplementary in-tutorial tests will be offered. Students who do not attend and do not have adequate reason will be awarded a mark of zero. Given the marking policy above, an absence from one of the in-tutorial tests is tolerated. In case more than one test is missed, you may apply for special considerations. If granted, the weight of final exam will be adjusted to cover missed test.

4.4 Mid-session exam

A mid-session exam will be held during week 6 on Tuesday, 24 August 2009. It will test topics covered during the first four weeks of lectures.

There is no supplementary mid-session exam. If you miss the exam and your special considerations request is approved the final will carry the weight of 70%. If you miss the exam without any special considerations, the final exam will carry 65% of the total mark (with 5% penalty for missed exam).

4.5 Group Project Assignment

You will be required to submit a group project report before the lecture of week 12 (12 October, 2009).

The project will be dealing with some aspects of modelling a financial time series. You will be required to write up your results in the form of a report where you provide justification for your preferred estimated model. The project format and marking criteria are set out in Section 12 below.

10% of the value of each assignment will be deducted for each day (24 hours) or part thereof which an assignment is submitted *after the deadline*. Assignments submitted more than five days late will not be marked.

4.6 Final Exam

The final exam will test the material covered in weeks 1 to 12. The duration of the final exam will be 2 hours and will be held in the University's final examination period.

5 ACADEMIC HONESTY AND PLAGIARISM

The University regards plagiarism as a form of academic misconduct, and has very strict rules regarding plagiarism. For UNSW's policies, penalties, and information to help you avoid plagiarism see: http://www.lc.unsw.edu.au/plagiarism/index.html as well as the guidelines in the online ELISE tutorial for all new UNSW students: http://info.library.unsw.edu.au/skills/tutorials/InfoSkills/index.htm.

6 COURSE EVALUATION AND DEVELOPMENT

Each year feedback is sought from students and other stakeholders about the courses offered in the School and continual improvements are made based on this feedback. UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process is one of the ways in which student evaluative feedback is gathered. You are strongly encouraged to take part in the feedback process.

7 STUDENT RESPONSIBILITIES AND CONDUCT

Students are expected to be familiar with and adhere to university policies in relation to class attendance and general conduct and behaviour, including maintaining a safe, respectful environment; and to understand their obligations in relation to workload, assessment and keeping informed.

Information and policies on these topics can be found in the 'A-Z Student Guide': https://my.unsw.edu.au/student/atoz/ABC.html. See, especially, information on 'Attendance and Absence', 'Academic Misconduct', 'Assessment Information', 'Examinations', 'Special Consideration', 'Student Responsibilities', 'Workload' and policies such as 'Occupational Health and Safety'.

7.1 Workload

It is expected that you will spend at least **ten hours** per week studying this course. This time should be made up of reading, research, working on exercises and problems, and attending classes. In periods where you need to complete assignments or prepare for examinations, the workload may be greater.

Over-commitment has been a cause of failure for many students. You should take the required workload into account when planning how to balance study with employment and other activities.

7.2 Attendance

Your regular and punctual attendance at lectures and seminars is expected in this course. University regulations indicate that if students attend less than eighty per cent of scheduled classes they may be refused final assessment.

7.3 Special Consideration and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You should seek assistance early if you suffer illness or misadventure

which affects your course progress. For advice on UNSW policies and procedures for granting special consideration and supplementary exams, see:

'UNSW Policy and Process for Special Consideration':
https://my.unsw.edu.au/student/atoz/SpecialConsideration.html

Students should note the following

- Applications for special consideration (including supplementary examinations) must go through UNSW Central administration (within 3 working days of the assessment to which it refers) – applications will **not** be accepted by teaching staff;
- Applying for special consideration does not automatically mean that you will be granted additional assessment or that you will be awarded an amended result;
- If you are making an application for special consideration (through UNSW Central Administration) please notify your Lecturer in Charge;
- Please note that a register of applications for Special Consideration is maintained. History of previous applications for Special Consideration is taken into account when considering each case.

ASB Policy and Process for Special Consideration and Supplementary Exams

In the case of undergraduate students in the ASB, requests for special consideration are determined by a Faculty wide panel. If the Faculty panel grants a special consideration request, this may entitle the student to sit a supplementary examination. In such cases the following procedures will apply:

- Supplementary exams will be scheduled centrally and will be held approximately two weeks after the formal examination period. Actual date will be advised by mid-semester.

- Where a student is granted a supplementary examination as a result of a request for special consideration, the student's original exam (if completed) will not be marked and only the mark achieved in the supplementary examination will count towards the final grade.

The 'ASB Policy and Process for Special Consideration and Supplementary Exams in Undergraduate Courses' is available at:
http://wwwdocs.fce.unsw.edu.au/fce/current/StudentSuppExamProcedure.pdf .

Further information for undergraduate students is on the ASB website (see 'Policies and Guidelines for Current Students').

7.4 General Conduct and Behaviour

You are expected to conduct yourself with consideration and respect for the needs of your fellow students and teaching staff. Conduct which unduly disrupts or interferes with a class, such as ringing or talking on mobile phones, is not acceptable and students may be asked to leave the class. More information on student conduct is available at: www.my.unsw.edu.au

7.5 Occupational Health and Safety

UNSW Policy requires each person to work safely and responsibly, in order to avoid personal injury and to protect the safety of others. For more information, see https://my.unsw.edu.au/student/atoz/OccupationalHealth.html.

7.6 Keeping Informed

You should take note of all announcements made in lectures, tutorials or on the course web site. From time to time, the University will send important announcements to your university e-mail address without providing you with a paper copy. You will be deemed to have received this information. It is also your responsibility to keep the University informed of all changes to your contact details.

8 STUDENT RESOURCES AND SUPPORT

The University and the ASB provide a wide range of support services for students, including:

- **ASB Education Development Unit (EDU)** (www.business.unsw.edu.au/edu)

Academic writing, study skills and maths support specifically for ASB students. Services include workshops, online and printed resources, and individual consultations. EDU Office: Room GO7, Ground Floor, ASB Building (opposite Student Centre); Ph: 9385 5584; Email: edu@unsw.edu.au

- **UNSW Learning Centre** (www.lc.unsw.edu.au)

Academic skills support services, including workshops and resources, for all UNSW students. See website for details.

- **Library training and search support services:** http://info.library.unsw.edu.au
- **UNSW IT Service Desk:** Technical support for problems logging in to websites, downloading documents etc. Library, Level 2; Ph: 9385 1333. Website: www.its.unsw.edu.au/support/support_home.html
- **UNSW Counselling Service** (http://www.counselling.unsw.edu.au)

Free, confidential service for problems of a personal or academic nature; and workshops on study issues such as 'Coping With Stress' and 'Procrastination'. Office: Level 2, Quadrangle East Wing ; Ph: 9385 5418

- **Student Equity & Disabilities Unit** http://www.studentequity.unsw.edu.au)

Advice regarding equity and diversity issues, and support for students who have a disability or disadvantage that interferes with their learning.
Office: Ground Floor, John Goodsell Building; Ph: 9385 4734

9 COURSE RESOURCES

The website for this course is on WebCT Vista.

Lecture notes, lecture slides and tutorial questions, with additional readings, will be posted on the WebCT Vista Course website. Lecture notes provide concise description of lecture material, but cannot be used as a substitute for a book.

Textbook:

The main textbook for the subject is:

Brooks, Chris (2008) Introductory Econometrics for Finance, Cambridge University Press. Second Edition.

This book is recommended, but it is not required. Any other econometrics book which covers the discussed topics may be used as a substitute. For more advanced treatment you may use any book mentioned below instead of this book. This book is written at an introductory level and covers most of the material we will discuss in class. In addition, it describes how to estimate the econometric models in the software program EViews.

Advanced texts:

Campbell, J.Y., A.W. Lo, and A.C. MacKinlay (1997). The Econometrics of Financial Markets. Princeton University Press.

Tsay, Ruey S. (2002), Analysis of Financial Time Series, John Willey & Sons.

Rachev, S.T., Mittnik, S., Fabozzi, F.J., Focardi, S.M., Teo, J., Financial Econometrics: From Basics to Advanced Modeling Techniques, John Willey & Sons.

These books treat the material at a more advanced level than the Brooks textbook. They are highly recommended for graduate and honours students and for undergraduate students who feel comfortable with more quantitative treatment and plan to pursue thus subject in the future.

Journal Articles:

Cont, R., (2001) Empirical properties of asset returns: stylized facts and statistical issues, *Quantitative Finance* 1, 223–236

Sharpe, W.F., (1991) Capital Asset Prices with and without Negative Holdings, *Journal of Finance*, 46(2), 489-509

Engle, R.F., (2001) GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics, *Journal of Economic Perspectives*, 15(4), 157-168.

Lee T.-H. & Bao Y., Saltoglu B., (2007) Comparing density forecast models, Journal of Forecasting, 26(3), 203-225.

Brock, W., Lakonishok, J., LeBaron, B., (1992) Simple Technical Trading Rules and the Stochastic Properties of Stock Returns, Journal of Finance, vol. 47(5), 1731-1764.

10 LECTURE SCHEDULE[1]

Week 1 – 20 July

Introduction and Topic 1: Understanding Financial Data

Brooks: Chapter 1
Lecture notes: Topic 1

Weeks 2, 3 – 27 July, 3 August

Topic 2: Linear Regression Tests of Asset Pricing Models

Brooks: Chapters 2-4
Lecture notes: Topic 2

Weeks 4, 5 – 10 August, 17 August

Topic 3: Linear Time Series Methods

Brooks: Chapter 5
Lecture notes: Topic 3

Week 6 – 24 August: Mid-session exam

Week 7 – 31 August

Feedback on the Midsession exam and
Topic 4: Risk and Volatility Models

Brooks: Chapter 8 (8.1-8.9)
Lecture notes: Topic 4

Week 8 – 14 September

Topic 5: Value at Risk
Lecture notes: Topic 5

Week 9 – 21 September

Topic 6: Extensions of ARCH/GARCH models

Brooks: Chapter 8,
Lecture notes: Topic 6

Weeks 10, 12 – 28 September, 12 October

Topic 7: Modelling long-run relationships in Finance
Additional topic: Trading strategies.

Brooks: Chapters 6.11-7
Lecture notes: Topic 7

Week 13 – 19 October

Course Review

[1] The schedule is approximate and is subject to change

11 TUTORIAL SCHEDULE[2]

Week 2 – w.b. 27 July: Lab: Introduction to Eviews, Topic 1

Week 3 – w.b. 3 August: Topic 2

Week 4 – w.b. 10 August: test, Topic 2

Week 5 – w.b. 17 August: Topic 3

Week 6 – w.b. 24 August: Topic 3

Week 7 – w.b. 31 August: Lab: Topic 3

Week 8 – w.b. 14 September: Topic 4

Week 9 – w.b. 21 September: test and Topic 5

Week 10 – w.b. 28 September: Topic 6

Week 11 – w.b. 5 October: test and Topic 7

Week 12 – w.b. 12 October: Topic 7

Week 13 – w.b. 19 October: Review

[2] The schedule is approximate and is subject to change

12 REPORT MARKING CRITERIA AND PREPARATION ADVICE

Marking criteria

Logical structure, clear written expression, conformity to length	3
Correct use of references and reference list	2
Evidence of research effort beyond references given in course material	2
Quality of analysis and use of correct methods	5
Logical conclusions	3
Total	15

Report Preparation Advice

Plan your Report and produce a draft structure to clarify your ideas and to develop a logical Report structure.
Do not use bullet points and use sub-headings sparingly. You are writing an Report, not a report.
Make sure your grammar and expression are clear – consider whether your meaning is clear to a reader.
Use simple language (big words do not necessarily impress). Remember to address yourself to the reader.
Avoid slang, colloquialisms, & conversational styles of language.

For written assessments, students will be expected to demonstrate an ability to read further than the prescribed readings and to use work published in academic journals. Reports are expected to follow traditional academic referencing styles and to have clear structure.

Citing References: You should cite your sources using the Harvard System and include all cited sources in a reference list.

Format: Reports should be one and half spaced. Under no circumstances should an Report be typed on both sides of a single page.

Margins: on both the left and right hand sides of the page. This provides adequate room for comments as well as creating an uncluttered presentation.

Page Numbers and Format: All pages should be numbered consecutively. A cover page must give a title to your Report and include your name, student number and the date on which you submit the Report.

Quotations: In general, all quotations should be enclosed with single inverted commas. The exception is quotations of two or more sentences which run to four or more lines – these quotes should be indented. However, long quotes should be avoided where possible. Excess use of long quotes will be penalised.

A Bibliography: is a standard requirement of all Reports and should contain all references cited. Do not include material which is quoted in one of the references unless the quoted source was actually consulted by you.