

School of Economics and Finance

## QUAN304 FINANCIAL ECONOMETRICS

Trimester One 2007

### COURSE OUTLINE

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#### Contact Details

Course coordinator: Dr. Jin Seo Cho  
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Email: JinSeo.Cho@vuw.ac.nz  
Office Hours: 10:00 to 11:00AM on Tue and Thu

Course lecturer: Associate Prof. John McDermott  
Room: RH427  
Phone: (04) 463-6708  
Email: John.McDermott@vuw.ac.nz  
Office Hours: TBA

#### Class Times and Room Numbers

Class times: 11:30 to 12:20 Monday, Tuesday and Friday  
Room: GBLT3  
Tutorial times: TBA during the 1<sup>st</sup> Week  
Tutorial room: TBA during the 1<sup>st</sup> Week  
Midterm exam time: TBA (One of the days in the 7<sup>th</sup> Week)  
Final exam time: Exam day announced by the university authority

#### Course Objectives

The main objective of Quan304 is given to the quantitative approach so that students can be familiar with data manipulations together with their relevant financial econometric theories. For this goal, we introduce relevant theories whenever they are required for a better understanding of the course materials, though not covered in the textbook.

#### Course Content

To achieve the course objective, we study the econometrics dealing with financial time series models, and their applications. Emphases will be given to the analysis of stationary and basic non-stationary time series data, if time permits. The first six weeks are contributed to the analysis of linear econometric models as an extension of Quan201, and the second six weeks are devoted to non-linear models for stationary data.

Every week (except first (and second) weeks of each half) has four-hour classes: three-hour regular classes and one-hour optional tutorial. The three-hour classes will be taking place in the classrooms mentioned below, and the one-hour tutorial will be used for data analyses using computers. For the computer manipulation, we'll use statistical package called *Eviews*,

available at the Cybercommon room. Although we mention that the tutorials are optional, attendances are highly recommended. Assignments, test and examination will cover the course materials taught in tutorials as well as regular classes. Further, if necessary, there will be extra problem-solving classes before the due day of assignments. Attendance to these is also optional but intended to assist students unfamiliar with mathematics.

Finally, other course information will be announced via Blackboard, and personal advice can be given by e-mail notification. If one's e-mail address in the Blackboard is incorrect, then students are advised to rectify it as soon as possible.

#### Course Plan

- The First Half:
  - 1<sup>st</sup> week: Preliminaries: Statistics, Mathematics and Theory of Probability
  - 2<sup>nd</sup> week: Preliminaries: Statistics, Mathematics and Theory of Probability
  - 3<sup>rd</sup> week: Classical Regression Models and the CAPM model
  - 4<sup>th</sup> week: Classical Regression Models and the CAPM model
  - 5<sup>th</sup> week: Extensions of Classical Regression Models and Applications in Finance
  - 6<sup>th</sup> week: Extensions of Classical Regression Models and Applications in Finance
- Mid-trimester Break: 9 to 22 April
- The Second Half:
  - 7<sup>th</sup> week: Preliminaries: Maximum Likelihood Estimation
  - 8<sup>th</sup> week: Preliminaries: Maximum Likelihood Estimation
  - 9<sup>th</sup> week: GARCH
  - 10<sup>th</sup> week: GARCH
  - 11<sup>th</sup> week: Simulation Methods
  - 12<sup>th</sup> week: Regime Switching Models

#### Assignment Plan

- 2<sup>nd</sup> Week: First assignment is distributed
- 4<sup>th</sup> Week: Second assignment is distributed; First assignment is collected
- 6<sup>th</sup> Week: Second assignment is collected
- 7<sup>th</sup> Week: Midterm test (Time and venue will be announced at 6<sup>th</sup> week)
- 8<sup>th</sup> Week: Third assignment is distributed
- 10<sup>th</sup> Week: Fourth assignment is distributed; Third assignment is collected
- 12<sup>th</sup> Week: Fourth assignment is collected
- Exam Week: Final exam

Assignment and test results will be returned to students as soon as marking is completed.

#### Expected Workload

For students who have fulfilled the normal prerequisites at VUW, about 13 hours per week should be weekly average workload, which includes class times. From the prior experiences, students can reduce workloads substantially by participating in class activities vigorously and not by accumulating them at the end of trimester.

#### Group Work

Group work is not allowed in this course.

#### Readings

- Chris Brooks, (2002), *Introductory Econometrics for Finance*, Cambridge University Press.
- Engle, R. (2001) "GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics" *Journal of Economic Perspectives*, Vol. 15, No. 4, pp 157–168.
- Handouts

### Materials and Equipment

A calculator may be needed for the midterm and final examinations.

### Assessment Requirements

There are two examinations. The first is test, and the second is final. The test will be made for two hours of the seventh week. Exact place and time will be announced during the sixth week. The final exam will be taken in the place and at the time announced by the university authority (5 to 25 June, 2006). Assessment will be made by the following formula:

$$FM = 0.3 \text{ Asg} + 0.4 \text{ Tst} + 0.4 \text{ Fin},$$

where  $FM$  = final mark,  $Asg$  = assignments,  $Tst$  = test,  $Fin$  = final exam. In case without taking test, zero score will be endowed. Occasionally, group assessments will be made when discussions among students are encouraged.

### Mathematics and Statistics Requirements

One of the prerequisites for Quan304 are basic knowledge on probability, differentiation, algebra and basic statistics covered in Quan201 and Quan203. If there is any unfamiliar terminology in the following box, then extra efforts are required from students. Whenever facing with unfamiliar mathematics or statistics, consulting instructors *instantly* is highly recommended. Instructors will be happy to help students. From the prior experience, absence or reluctant meeting with instructors accumulates workloads at the final, and results in poor performance.

Limit	Expected value
Sum ( $\Sigma$ ) and product ( $\Pi$ )	Variance
Univariate and multivariate normal distributions	Conditional expectation
Probability density function (PDF)	Hypothesis test
Cumulative distribution function (CDF)	First-order condition
Inverse matrix	Sum and product of matrices

### Mandatory Course Requirements

There is no mandatory requirement in this course.

### Communication of Additional Information

Quan304 has a course home page at Blackboard. Any course announcement and course handouts will be available at the course homepage.

### Faculty of Commerce and Administration Offices

#### Railway West Wing (RWW) - FCA Student and Academic Services Office

The Faculty's Student and Academic Services Office is located on the ground and first floors of the Railway West Wing. The ground floor counter is the first point of contact for general

enquiries and FCA forms. Student Administration Advisers are available to discuss course status and give further advice about FCA qualifications. To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

#### Easterfield (EA) - FCA/Education/Law Kelburn Office

The Kelburn Campus Office for the Faculties of Commerce and Administration, Education and Law is situated in the Easterfield Building - it includes the ground floor reception desk (EA005) and offices 125a to 131 (Level 1). The office is available for the following:

- Duty tutors for student contact and advice.
- Information concerning administrative and academic matters.
- Forms for FCA Student and Academic Services (e.g. application for academic transcripts, requests for degree audit, COP requests).
- Examinations-related information during the examination period.

To check for opening hours call the Student and Academic Services Office on (04) 463 5376.

#### **General University Policies and Statutes**

Students should familiarise themselves with the University's policies and statutes, particularly the Assessment Statute, the Personal Courses of Study Statute, the Statute on Student Conduct and any statutes relating to the particular qualifications being studied; see the Victoria University Calendar or go to [www.vuw.ac.nz/policy](http://www.vuw.ac.nz/policy).

For information on the following topics, go to the Faculty's website [www.vuw.ac.nz/fca](http://www.vuw.ac.nz/fca) under Important Information for Students:

- Academic Grievances
- Academic Integrity and Plagiarism
- Student and Staff Conduct
- Meeting the Needs of Students with Impairments
- Student Support

#### **Manaaki Pihipihinga Programme**

Manaaki Pihipihinga is an academic mentoring programme for undergraduate Māori and Pacific students in the Faculties of Commerce and Administration, and Humanities and Social Sciences. Sessions are held at the Kelburn and Pipitea Campuses in the Mentoring Rooms, 14 Kelburn Parade (back courtyard), Room 109D, and Room 210, Level 2, Railway West Wing. There is also a Pacific Support Coordinator who assists Pacific students by linking them to the services and support they need while studying at Victoria. Another feature of the programme is a support network for Postgraduate students with links to Postgraduate workshops and activities around Campus.

For further information, or to register with the programme, email [manaaki-pihipihinga-programme@vuw.ac.nz](mailto:manaaki-pihipihinga-programme@vuw.ac.nz) or phone (04) 463 5233 ext. 8977. To contact the Pacific Support Coordinator, email [pacific-support-coord@vuw.ac.nz](mailto:pacific-support-coord@vuw.ac.nz) or phone (04) 463 5842.