

VICTORIA INTERNATIONAL APPLIED FINANCE PROGRAMME
School of Economics and Finance

MMAF524 FINANCIAL ECONOMETRICS

Trimester One 2009

COURSE OUTLINE

Contact Details

The course coordinator is Professor Vance L. Martin. Preferred contact is by email. The email address is: vance@unimelb.edu.au.

Block Release Times

Wednesday 15th April through the morning of Friday 17th April, inclusive.
and Wednesday 10th June through the **afternoon** of Monday 12th June, inclusive.

A detailed schedule of each block release will be supplied closer to the April and June sessions. **Attendance for all sessions of both block releases is compulsory.**

Course Learning Objectives

Students should be able to:

- Apply quantitative tools to model, estimate and forecast financial variables
- Analyse the statistical properties of financial prices and returns;
- Evaluate models of risk based of the Capital Asset Pricing Model an variants assuming non-normal return processes;
- Analyse recent advances in unit root and co-integration methods in modelling the term structure of interest rates and asset price bubbles;
- Describe the strengths and limitations of alternative quantitative methods by reproducing existing results using computer skills and mathematical modelling techniques, in conjunction with a range of financial data set;
- Perform sensitivity analyses on proposed models, which should include the application of alternative distributional specifications to model risk.

Course Content

This course is concerned with the application of quantitative tools to model, estimate and forecast financial variables. Topics considered include: the analysis of the properties of financial data with an emphasis on non-normality and non-stationarity; the application of estimation methods including unit roots and co-integration, to the rational valuation model of share prices; the application of the GARCH class of models to estimate volatility and to test the capital asset pricing model. The course will also include an introduction to more complex financial econometrics such as artificial neural-networks, generalised method of moments and state-space modelling.

BLOCK RELEASE ONE	BLOCK RELEASE TWO
<p style="text-align: center;"><u>Day One</u></p> <p style="text-align: center;">Understanding Financial Data and Linear Regression</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">Filtering, Predictability, Distributions, the Linear Regression Model</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Stock Market Efficiency, Commodity Returns, CAPM, Arbitrage Pricing</p>	<p style="text-align: center;"><u>Day One</u></p> <p style="text-align: center;">Modelling Risk and Volatility</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">GARCH, MGARCH, TGARCH</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Time-Varying Risk Premia, Time-Varying Beta Models, Leverage Effects</p>
<p style="text-align: center;"><u>Day Two</u></p> <p style="text-align: center;">Nonstationary Financial Models</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">Unit roots, Long-range Dependence, Cointegration, VECMs</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Zero Coupon Rates, Term Structure of Interest Rates</p>	<p style="text-align: center;"><u>Day Two</u></p> <p style="text-align: center;">Nonlinear Financial Models</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">Artificial Neural Networks, Nonparametric Regression and GMM Estimation</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Interest Rates, SDEs, C-CAPM, Contagion</p>
<p style="text-align: center;"><u>Day Three</u></p> <p style="text-align: center;">Forecasting Financial Models</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">Ex Post and Ex Ante Forecasting, Univariate and Multivariate Models, Forecast Statistics</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Share Prices, Interest Rates</p>	<p style="text-align: center;"><u>Day Three</u></p> <p style="text-align: center;">Computer Assignment - Open-Book</p> <p style="text-align: center;">Topics</p> <p style="text-align: center;">All material covered in the course</p> <p style="text-align: center;">Applications</p> <p style="text-align: center;">Unseen problem</p>

Expected Workload

Total average workload of 200 hours. During the approximately 6 weeks of term prior to each block release, students will need to allow about 14 hours per week for study, research and preparation of assignments for this course. The two block courses together involve approximately 40 hours of work.

Reading and Reference Material

A full set of lecture notes and exercises are included on Blackboard as well as supplied in print.

Article Reference Material

1. Chapman, D.A. and Pearson, N.D. (2000), "Is the Short Rate Drift Actually Nonlinear?" The Journal of Finance, LV, 355-388.

Finance Textbook References

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

This is an excellent financial econometrics text which is commonly used in graduate programs.

2. Hull, J.C. (2000), Options, Futures and Other Derivatives, Prentice-Hall International, NJ, 4th edition.

This is an excellent finance text which concentrates on derivative securities. It also covers some of the econometric issues covered in the course.

Econometric Textbook References

The following books provide additional background econometric material for the course.

1. Pindyck, R.S. and Rubinfeld, D.L. (1998), Econometric Models and Economics Forecasts, 4th edition, McGraw-Hill, New York.

This is an intermediate level text which is commonly used in introductory PhD econometric courses. It covers most of the basic topics in econometrics.

2. Kawakatsu, H. (1998), A Computer Handbook Using Eviews, McGraw-Hill, New York.

This is a companion text for the Pindyck and Rubinfeld textbook which provides Eviews worked examples. The data files are available from the Eviews website.

<http://www.eviews.com>

3. Patterson, K. (2000), An Introduction to Applied Econometrics: A Time Series Approach, Macmillan Press Ltd, London.

This is a new text which provides an excellent introduction to time series models with a strong emphasis on application. This book provides the necessary extensions of nonstationary time series models not covered by Pindyck and Rubinfeld.

4. Greene, W.H. (1999), *Econometric Analysis*, 4th edition, Macmillan, New York.

This is an intermediate level text which is commonly used in introductory PhD econometric courses. It represents an extension of many of the topics covered in Pindyck and Rubinfeld. It covers both time series and cross-sectional methods with special attention given to the latter class of models.

5. Hamilton, J.D. (1994), *Time Series Analysis*, Princeton University Press, Princeton, New Jersey.

This is an advanced econometric text which is commonly used in higher level PhD econometric courses. The book specialises in time series models with an emphasis on theory, although a number of applied examples are presented to motivate the models and to show how the theory is implemented.

Materials and Equipment

A calculator may be useful for the test.

Assessment Requirements

1. Theoretical assignment worth 30% of marks.
This assignment is based on the first block of material held in April. No computing is required but you will need to be able to interpret Eviews output. The assignment will be handed out at the end of the first block and the answers will be due on May 1st 2009.
2. Theoretical assignment worth 30% of marks.
This assignment is based on the second block of material held in June. No computing is required but you will need to be able to interpret Eviews output. The second assignment will be handed out just before the start of the second block and the answers will be due on June 26th 2009.
3. Empirical open-book computer assignment worth 40%
This assignment is based on an unseen applied problem which requires Eviews. The computer assignment is based on all material covered in the course, Blocks 1 and 2, and will be held on 12th June 2009.

Penalties

Marks for each assignment will diminish by 5% for every day late, with a weekend counting as one day. The date of submission or the day of postmark (if by post) shall be taken as the date of delivery. There will be a final cut off date, which is one week after the due date for each assignment, after which no assignment can be accepted.

Mandatory Course Requirements

To pass, a student must: (i) attend all sessions of both block release courses; (ii) obtain an average mark of at least 50% over total course assessment; (iii) obtain at least 50% in the test.

Communication of Additional Information

Additional information including assignment questions, details of the block course schedule, feedback on course assessments, etc will be provided primarily via Blackboard (<http://blackboard.vuw.ac.nz/>) and possibly also by email and post. Students are responsible for ensuring that the VIAF administrator, (email: viaf-programme@vuw.ac.nz), has their up to date email and postal addresses, as well as ensuring your details are correct on Student Records.

If you have, or become aware of, any health condition that could prevent you attending a VIAF compulsory block release, then you should notify the Programme director immediately, preferably by email, dawn.lorimer@vuw.ac.nz.

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 first floor. 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.

Notice of Turnitin Use

Student work provided for assessment in this course may be checked for academic integrity by the electronic search engine <<http://www.turnitin.com>>. Turnitin is an on-line plagiarism prevention tool which identifies material that may have been copied from other sources including the Internet, books, journals, periodicals or the work of other students. Turnitin is used to assist academic staff in detecting misreferencing, misquotation, and the inclusion of unattributed material, which may be forms of cheating or plagiarism. *At the discretion of the School, handwritten work may be copy typed by the School and subject to checking by Turnitin.* You are strongly advised to check with your tutor or the course coordinator if you are uncertain about how to use and cite material from other sources. Turnitin will retain a

copy of submitted materials on behalf of the University for detection of future plagiarism, but access to the full text of submissions will not be made available to any other party.

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 available in hard copy or on the VUW website at <http://www.victoria.ac.nz/home/study/calendar.aspx>

Student and Staff Conduct

The Statute on Student Conduct together with the Policy on Staff Conduct ensure that members of the University community are able to work, learn, study and participate in the academic and social aspects of the University's life in an atmosphere of safety and respect. The Statute on Student Conduct contains information on what conduct is prohibited and what steps are to be taken if there is a complaint. For information queries about complaint procedures under the Statute on Student Conduct, contact the Facilitator and Disputes Advisor or refer to the statute on the VUW policy website at:

www.victoria.ac.nz/home/about/policy/students.aspx

The Policy on Staff Conduct can be found on the VUW website at:

www.victoria.ac.nz/home/about/policy/staff.aspx

Academic Grievances

If you have any academic problems with your course you should talk to the tutor or lecturer concerned; class representatives may be able to help you in this. If you are not satisfied with the result of that meeting, see the Head of School or the relevant Associate Dean; the VUWSA Education Coordinator is available to assist in this process. If, after trying the above channels, you are still unsatisfied, formal grievance procedures can be invoked. These are set out in the Academic Grievance Policy which is published on the VUW website at:

www.victoria.ac.nz/home/about/policy/students.aspx

Academic Integrity and Plagiarism

Academic integrity is about honesty – put simply it means *no cheating*. All members of the University community are responsible for upholding academic integrity, which means staff and students are expected to behave honestly, fairly and with respect for others at all times. Plagiarism is a form of cheating which undermines academic integrity. The University defines plagiarism as follows:

The presentation of the work of another person or other persons as if it were one's own, whether intended or not. This includes published or unpublished work, material on the Internet and the work of other students or staff.

It is still plagiarism even if you re-structure the material or present it in your own style or words.

Note: It is however, perfectly acceptable to include the work of others as long as that is acknowledged by appropriate referencing.

Plagiarism is prohibited at Victoria and is not worth the risk. Any enrolled student found guilty of plagiarism will be subject to disciplinary procedures under the Statute on Student Conduct and may be penalized severely. Consequences of being found guilty of plagiarism can include:

- an oral or written warning

- cancellation of your mark for an assessment or a fail grade for the course
- suspension from the course or the University.

Find out more about plagiarism, and how to avoid it, on the University's website:

www.vuw.ac.nz/home/studying/plagiarism.html

Students with Impairments (see Appendix 3 of the Assessment Handbook)

The University has a policy of reasonable accommodation of the needs of students with disabilities. The policy aims to give students with disabilities the same opportunity as other students to demonstrate their abilities. If you have a disability, impairment or chronic medical condition (temporary, permanent or recurring) that may impact on your ability to participate, learn and/or achieve in lectures and tutorials or in meeting the course requirements, please contact the course coordinator as early in the course as possible. Alternatively, you may wish to approach a Student Adviser from Disability Support Services (DSS) to discuss your individual needs and the available options and support on a confidential basis. DSS are located on Level 1, Robert Stout Building:

telephone: 463-6070

email: disability@vuw.ac.nz

The name of your School's Disability Liaison Person is in the relevant prospectus or can be obtained from the School Office or DSS.

Student Support

Staff at Victoria want students to have positive learning experiences at the University. Each faculty has a designated staff member who can either help you directly if your academic progress is causing you concern, or quickly put you in contact with someone who can.

Assistance for specific groups is also available from the Kaiwawao Maori, Manaaki Pihipihinga or Victoria International.

In addition, the Student Services Group (email: student-services@vuw.ac.nz) is available to provide a variety of support and services. Find out more at:

www.victoria.ac.nz/st_services/

VUWSA employs an Education Coordinator who deals with academic problems and provides support, advice and advocacy services, as well as organising class representatives and faculty delegates. The Education Office (tel. 463-6983 or 463-6984, email at education@vuwsa.org.nz) is located on the ground floor, Student Union Building.

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 or phone (04) 463 6015. To contact the Pacific Support Coordinator, email pacific-support-coord@vuw.ac.nz or phone (04) 463 5842.