# COURSE OUTLINE

# *FINC406 – Advanced Financial Econometrics*

## Semester One, 2023

## Contents

# Paper Description and Aims

The aim of the course is to acquaint the students with applying financial econometrics for empirical research in finance. Financial econometrics is a subfield of econometrics that focuses on the application of statistical methods to financial data. It is used to model and analyze financial markets and securities, and to test hypotheses about financial phenomena such as returns, volatility, and risk. Major topics covered in this course include regression analysis, time series modelling, unit root analysis, cointegration and error correction models, vector autoregression (VAR), volatility modelling with ARCH/GARCH, simultaneous equation model, Logit/Probit models, and modelling with panel data. The statistical package STATA will be used intensively in the course and the students are expected to use STATA on their own in analysing the data. An introductory lecture on STATA software will be given at the beginning of the course to teach the basics and other procedures will be introduced during the lectures.

# Learning Outcomes

| *Upon successful completion of this paper, you should be able to:* | Graduate attributes and Learning outcomes mapping |
|---|---|
| LO1. Understand the types and forms of data and how to use them in an econometric analysis to answer either day-to-day or research questions in Finance. | LO 1.1 |
| LO2. Identify the sources of financial data (Bloomberg, Capital IQ, WRDS, Yahoo Finance, etc.) that can be used to extract the necessary data for an econometric analysis. | LO 1.1, LO 4.3 |
| LO3. Demonstrate the knowledge on econometric techniques such as regression analysis, univariate and multivariate time series analysis, and panel data analysis. | LO 1.1, LO1.2 |
| LO4. Apply appropriate econometric techniques in solving problems in finance using the STATA software. | LO 2.1, LO 4.3 |
| LO5. Demonstrate the ability to report, interpret and present the results obtained from an econometric analysis. | LO3.1, LO3.2, LO4.2 |

# Teaching Staff

**Paper Coordinator and Lecturer:**     Dr. **Duminda** Kuruppuarachchi

      Office:        OBS Room 5.29
      Email:        duminda.ka@otago.ac.nz
      Phone:       03 479 5609
      Office Hours:  Tuesday 12 noon – 12.50 pm, Thursday 2pm – 3pm

You should contact the paper coordinator on any administrative enquiries about the paper, e.g. tutorial changes, or requests for late submission of assignments.

# Course Delivery[1]

Lectures (Venue): NCAL (Science bulding lower floor)
**Tuesday** 9:00-10:50 and **Thursday** 15:00-16:50

Every week, students must attend two lectures of 2 hours duration in each. During the lectures, the students will learn the econometric and time series theory required for real life problem-solving using the statistical package STATA. STATA will be available for the students via Student Desktop planform (See https://blogs.otago.ac.nz/studentit/ for details). All the course materials and notices will be posted on Blackboard regularly and it is the responsibility of the student to regularly check the Blackboard.

It is essential to participate all the lectures. Students who miss a lecture are expected to catch up on missed material on their own. Lecture materials mainly consists of presentation slides and case studies along with sample datasets. Relevant textbook chapters are indicated in the course calendar for each topic being taught. Additional materials will be provided in case the recommended textbook does not cover the corresponding topic of a week. Class preparation and reading are expected as a part of the course workload.

**Semester Workload Breakdown of the Course**

| | |
|---|---|
| Lectures | 52 hours |
| Class preparation / reading | 42 hours |
| Projects / presentations | 75 hours |
| Final exam preparation | 71 hours |

# Course Learning Resources

**Recommended Textbook (available in the central library):**

[RT]  Principles of econometrics by R. Carter Hill; William E. Griffiths; G. C. Lim , 5th ed. Hoboken, NJ : Wiley 2018.

**Supplementary Reading (available in the central library and online):**

[SR1]  Using STATA for Principles of Econometrics by Lee C. Adkins; R. Carter Hill; 5th ed. NY: Wiley 2018.

[SR2]  The Basics of Financial Econometrics: Tools, Concepts, and Asset Management Applications by Frank J. Fabozzi; Sergio M. Focardi; Svetlozar T. Rachev; Bala G. Arshanapalli: Wiley 2014.

**Library resources**: Home - Accountancy & Finance - LibGuides at University of Otago

# Blackboard

https://blackboard.otago.ac.nz provides you with access to course materials such as lecture notes, case studies, class notices, and resources. Blackboard email facility is used to email the whole class so it is important that you check your student email and *Blackboard* regularly.

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[1] Information in this section is subject to change due to COVID-19 pandemic restrictions in the country time to time.

Further information about student support, learning support and information, academic integrity and other University resources for students is available on the COMMERCE_UG_2020: Commerce Undergraduate Students site on Blackboard.

# Student Webmail

We will use your student email account to email you information relevant to your programme. To forward your University email address to an email address that you use regularly take the following steps:

1. Log into your StudentMail account (http://www.otago.ac.nz/smlanding/) using your student username and password.

2. Click the **Cog** button (top right corner).

3. Click on **Mail** under **Your App Settings**.

4. Under **Accounts** on left hand side, select **Forwarding**.

5. Under the Forwarding heading, type in the email address you want your email to be forwarded to. You can also choose to have a copy of these emails kept on your StudentMail account, so please check the box if you would like this.

6. Click the **Save** button.

# Assessment

All material presented in the class is examinable (except where stated otherwise) by assignments and the final examination. All important assessment information such as due dates and times, content, guidelines and so on will be discussed in the class, and where appropriate detailed on Blackboard. *Students are responsible for ensuring that they are aware of this information, keeping track of their own progress, and catching up on any missed classes.*

| Assessment | % of final grade |
|---|---|
| In-class Assignment (before mid-term break) | 15 |
| Project Report (due on a week before the last lecture) | 20 |
| Presentations on Project Report (during a week prior to the last lecture) | 15 |
| Final Written Examination | 50 |
| **Total** | **100** |

**In-class assignment** is a 1 ½ -hour practical exercise which students are required to select and apply suitable analytical techniques for given mini-cases, and to report the results adhering to specified guidelines in the assignment. Soft copies of the completed assignment are required to be submitted at the end of the corresponding session (see course calendar) with the student's ID number and the name printed on the front page of the document. The accuracy, quality and timely submission of assignments will be the basis for scoring them. Late assignments are not allowed unless permission is given under special circumstances.

**Project Report** is a group work which will be based on a given set of instructions. The objective of this project is to provide students with the experience in downloading data, organizing datasets, analysing, and reporting results for a real-life financial market issue. **Presentations** will be based on the group project reports and all group members are required to present. A group mark will be allocated for the project report whereas an individual mark will be given for the presentations. A detailed set of guidelines of the project will be posted on Blackboard two weeks prior to the report submission date (refer course calendar for the due dates).

**Final Written Examination** (2-hour) will mainly be based on explaining concepts and interpretation of provided results. A sample set of questions will be discussed during the review session in the final week (see course calendar).

The grading scheme used at Otago is:

| | | | |
|---|---|---|---|
| **A+** | 90-100 | **C+** | 60-64 |
| **A** | 85-89 | **C** | 55-59 |
| **A-** | 80-84 | **C-** | 50-54 |
| **B+** | 75-79 | **D** | 40-49 |
| **B** | 70-74 | **E** | <40 |
| **B-** | 65-69 | | |

# Course Requirements

1. In order to pass the FINC406 paper you must: (i) pass the final examination with a minimum of 40% grade. The final exam will be a 2-hour close-book exam which is embargoed, and (ii) get an overall mark of at least 50% for the course. If you fail to score at least 40% in the final examination, your overall mark will be returned as *Failed Compulsory Assessment* regardless of your internal assessment marks (i.e., marks for assignments and the project).

2. Students who are unable to participate for the Realtime Assignment, or for the Project due to illness or other special circumstances, must provide the course coordinator with documentary evidence (such as a medical certificate) along with the special consideration form for appropriate actions to be taken. Failing to do so may result in a zero mark for the corresponding assessment. Please see the Blackboard for guidelines and application form on the special consideration for internal assessments.

**Referencing Style and Style Guide**
For this paper the referencing style is *Harvard*. Here is a link to the style guide: click here. Style guides are also available on the University Library website:
http://www.otago.ac.nz/library/quicklinks/citation/index.html

# Learning Outcomes-Assessments Mapping

| Learning Outcome | In-class Assignment | Project Report | Presentations on Project Report | Final Exam |
|---|:---:|:---:|:---:|:---:|
| LO1. Understand the types and forms of data and how to use them in an econometric analysis. | √ | √ | | |
| LO2. Identify the sources of financial data (Bloomberg, Capital IQ, Compustat, Yahoo Finance, etc.) that can be used to extract the necessary data for an econometric analysis. | | √ | | |
| LO3. Demonstrate the knowledge on econometric techniques such as regression analysis, univariate and multivariate time series analysis, and panel data analysis. | √ | √ | √ | √ |
| LO4. Apply appropriate econometric techniques in solving financial problems that arise in real life and research using the STATA software. | √ | √ | | √ |
| LO5. Demonstrate the ability to report, interpret and present the results obtained from a statistical analysis. | | √ | √ | |
| **Total** | **15%** | **20%** | **15%** | **50%** |

# Course Calendar

| Week | Topic | Reading | Lecture Materials |
|---|---|---|---|
| 1 | Introduction to Econometrics and STATA software, Data Types, Sources of Data, Descriptive Analysis, Regression Analysis | [RT] Chapter 1,2,5 [SR1] Chapter 1 | Lecture slides/ Case Study |
| 2 | Linear Regression Analysis, Diagnostics Tests, Indicator Variables, Testing for interactions between variables | [RT] Chapter 3,4,6,7 | Lecture slides/ Case Study |
| 3 | Non-linear Regression Models (Polynomial Models, Log-Linear Models, Log-log Models), Quantile Regression Analysis | [RT] Chapter 5, 7 [SR2] Chapter 7 | Lecture slides/ Case Study |
| 4 | Models with Binary, Multinomial, Ordinal, Count, and Limited Dependent Variables | [RT] Chapter 16 | Lecture slides/ Case Study |
| 5 | **In-class Assignment** Time-Series Data, Stationarity, Univariate Time Series Models, Regression with Stationary Time-Series | [RT] Chapter 9 | Lecture slides/ Case Study |
| 6 | Finite Distributed Lags; Serial Correlations and Heteroskedasticity issues, Modelling Conditional Volatility—ARCH/GARCH models | [RT] Chapter 9,14 | Lecture slides/ Case Study |
| 7 | Nonstationary Variables—Detection and their Impact, Cointegration and Error Correction Models, Endogeneity | [RT] Chapter 12, 10 | Lecture slides/ Case Study |
| 8 | Multivariate Time Series Modelling with Vector Autoregression (VAR/VECM), MV-GARCH models | [RT] Chapter 17 | Lecture slides/ Case Study |
| 9 | Panel Data Analysis (Fixed Effects and Random Effects Estimators, Dynamic Panel Data Models) | [RT2] Chapter 15 | Lecture slides/ Case Study |
| 10 | Specific Applications in Finance: Portfolio Analysis, Factor Models,  and Cross-sectional Analysis | | Case Study |
| 11 | Specific Applications in Finance: Event Studies | | Case Study |
| 12 | Specific Applications in Finance: Time varying coefficients | | Case Study |
| 13 | **Project Report Submission and Presentations** Review | | |

**Lectures end Friday 02 June 2023**
**University Exam Period 07 June - 21 June 2023**

# Class Representatives

The class (or student) representative system is an avenue for encouraging communication and consultation between staff and students. It provides you with a vehicle for communicating your views on the teaching and delivery of the paper and provides staff with an opportunity to communicate information and gain constructive feedback from students. It contributes to the development of a sense of community within a department and it adds a further dimension to the range of support services offered to students.

Volunteers for the role of class representatives will be called early in the semester. The OUSA invites all class representatives to a training session, conducted by OUSA, about what it means to be a class representative and some of the possible procedures for dealing with issues that arise. They also provide information on the services that OUSA offers and the role OUSA can play in solving problems that may occur. The OUSA provides support to class representatives during the semester. Departmental staff will also meet with class representatives during the semester to discuss general issues or matters they wish to have considered.

# Academic Integrity

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, submitting work written by someone else (including from a file sharing website, text generation software, or purchased work) taking unau thorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures.

It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at
www.otago.ac.nz/study/academicintegrity<http://www.otago.ac.nz/study/academicintegrity>, or ask at the Student Learning Centre (HEDC) or the Library, or seek advice from your paper co-ordinator.

For further information:
Academic Integrity Policy
http://www.otago.ac.nz/administration/policies/otago116838.html

Student Academic Misconduct Procedures
http://www.otago.ac.nz/administration/policies/otago116850.html

**Turnitin on Blackboard**
Turnitin is a text-matching software tool which reports matches between sections of student work submitted to it, and other material to which Turnitin has access (i.e. material available via the internet, and content of other student assignments which have previously been submitted to Turnitin). Turnitin is also often referred to as a plagiarism detection tool. All assignments submitted electronically through Blackboard are uploaded via Turnitin, and the report is available to the marker. You are able to check your draft assignment via Turnitin before you submit your final assignment. Full instructions and guidance for the use of Turnitin can be found at: https://help.otago.ac.nz/blackboard/assessing-your-students/turnitin/turnitin-for-students/

# Concerns about the Course

We hope you will feel comfortable coming to talk to us if you have a concern about the course. The course co-ordinator will be happy to discuss any concerns you may have. Alternatively, you can report your concerns to the class representative who will follow up with departmental staff. If, after making approaches via these channels, you do not feel that your concerns have been addressed, there are University channels that may aid resolution. For further advice or more information on these, contact the departmental administrator or head of department.

# Disclaimer

While every effort is made to ensure that the information contained in this document is accurate, it is subject to change. Changes will be notified in class and via Blackboard. Students are encouraged to check Blackboard regularly. It is the student's responsibility to be informed.


*Duminda Kuruppuarachchi*
*Dept. of Accountancy & Finance*
*February-2023*