

Econ 4120

Applied Forecasting Methods

Course Outline

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Teaching Team

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Course Overview

This course is aimed at the students who wish to gain a working knowledge of time series and forecasting methods as applied in economics and finance. The emphasis is on the understanding of the intuition underlying theoretical innovations and an ability to apply them. We will discuss topics in classic time series analysis, including stationary processes, ARMA processes, the modelling and forecasting with ARMA processes, Vector Autoregressions, Cointegration, etc. Part of this course will focus on applications in financial modelling. A tentative list of topics to be discussed include stock return predictability, GARCH and variants of GARCH models, the modelling and forecasting of realized volatility, etc.

Prerequisite

Students should be familiar with basic linear regression, linear algebra, basic probability and statistics, and (multivariate) calculus.

Course Assessment

1. Class Participation: 5%
2. Five Assignments: 25%
3. Midterm Exam: 25%
4. Final Exam: 45%

Software

The course will require use of the econometric package *Stata* to work on real data. The students can get access to *Stata* via the computing cluster in the Department of Economics: <https://scrp.econ.cuhk.edu.hk/guide/stata>. We will also use *Matlab* to demonstrate the mechanics of various methods. The students do not need any prior knowledge on *Stata* or *Matlab*.

Reference Books

- Required textbooks: (SW) Stock, James and Mark W. Watson, *Introduction to Econometrics*, 4th E.¹
- Supplementary textbook:
 - (1) Brockwell, Peter J., and Richard A. Davis. *Introduction to Time Series and Forecasting*. Springer, 2016.²
 - (2) Hyndman, Rob and George Athanasopoulos, 2021. *Forecasting: Principles and Practice*, 3rd E.³
 - (3) Linton, Oliver, 2019. *Financial Econometrics*. Cambridge University Press.⁴

¹You can read the book online [here](#).

²The book is downloadable in the CUHK library, see [here](#).

³The book is available online: <https://otexts.com/fpp3/>.

⁴You can read the book online via the university library.