IB9CD-15 Algorithmic Trading and Robo Advising

26/27

Department
Warwick Business School
Level
Taught Postgraduate Level
Module leader
Olga Klein
Credit value
15
Module duration
9 weeks
Assessment
20% coursework, 80% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

The first part of the module aims to provide a background in market microstructure, upon which algorithmic trading is introduced and examined in detail. It will cover topics such as trading strategies, electronic markets, market participants, algorithmic and high-frequency trading, and order types.

The second part of the module aims to provide students with a comprehensive understanding of the current market landscape and regulatory situation of robo-advising, the benefits and drawbacks of using robo-advisors, and a practical understanding of how robo-advisors operate and how they can be used to manage wealth.

Module web page

Module aims

To present market microstructure approach to security prices formation
To explain basic determinants of market illiquidity (asymmetric information, inventory holding costs and order processing costs)

To analyze the role of trade size and strategic behaviours of traders
To examine algorithmic and high frequency trading strategies in limit order markets
To explore and critically evaluate recent and new developments in the forms of algorithmic trading
To understand the current market landscape and regulatory situation of robo-advising
To explain the business model and workflow of robo-advisers
To understand and explain approaches for risk profiling of investors
To examine and critically evaluate goal-based investment strategies and model portfolio construction for robo-advisers

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

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Introduction to market microstructure
Order flow and liquidity
Inventory risk, trade size and market depth
Limit order markets
Algorithmic trading strategies
High frequency trading strategies
Introduction to the market landscape and regulation of robo-advisors
The workflow of a standard robo-advisor
Goal-based investing
Risk profiling of investors
Model portfolio construction
The benefits and drawbacks of robo-advising for investment management

Learning outcomes

By the end of the module, students should be able to:

- Understand, define and explain, intuitively and formally the microstructure approach to security price formation
- Understand and explain the current market landscape and regulatory situation of robo-advisers
- Explain key concepts covered in each lesson, and be able to apply these concepts for programming real-world algorithmic trading strategies and portfolio construction of robo-advisers
- Critically evaluate methods and designs in algorithimic trading and robo-advising research
- Reflect critically on implications of algo- and high-frequency trading on market liquidity and price discovery
- Critically evaluate approaches for goal-based investment strategies

Indicative reading list

Reading lists can be found in Talis

Research element

Research element will be included during lectures and seminars, in which students will discuss some of frontier research in algorithmic trading and its impact on market liquidity and price discovery.

Interdisciplinary

Given that the nature of the programme is inherently interdisciplinary, links to other disciplines, such as economics and finance will arise naturally throughout the module.

International

Algorithmic trading is used internationally, so many examples will naturally involve many countries and economies globally.

Subject specific skills

Use a variety of theoretical concepts and design methods to analyse, implement and assess solutions to problems in algorithmic trading and market microstructure
Explain why and how order imbalances move prices
Analyse the role of trade size and strategic behaviours of traders
Use appropriate tools to take theoretical models to data

Transferable skills

Demonstrate academic writing skills
Communicate complex ideas effectively, both verbally and in writing

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Study

Study time

Type	Required
Lectures	9 sessions of 1 hour (6%)
Seminars	9 sessions of 2 hours (12%)
Online learning (scheduled sessions)	(0%)
Private study	51 hours (34%)
Assessment	72 hours (48%)
Total	150 hours

Private study description

Private study includes pre-reading for lectures

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group D1

	Weighting	Study time	Eligible for self-certification
Assessment component			
45 min class test	20%	14 hours	No
Reassessment component is the same			
Assessment component			
Centrally-timetabled examination (On-campus) Written exam 2 hrs	80%	58 hours	No

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- Students may use a calculator
- Answerbook Pink (12 page)

Reassessment component is the same

Feedback on assessment

via my.wbs

Past exam papers for IB9CD

Availability

Courses

This module is Optional for:

- Year 1 of TIBS-N300 MSc in Finance
- Year 1 of TIBS-LN1J Postgraduate Taught Finance and Economics
- Year 1 of TIBS-N3G2 Postgraduate Taught Mathematical Finance