IB359-15 Derivatives and Risk Management

20/21

Department
Warwick Business School
Level
Undergraduate Level 3
Module leader
Alexander Stremme
Credit value
15
Module duration
10 weeks
Assessment
32% coursework, 68% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

N/A.

Module web page

Module aims

To build and extend students' understanding of the nature and characteristics of various types of financial risks, how these risks are measured and what their effects are on profitability/value.
To build and develop students' knowledge and understanding of the characteristics of different types of derivative securities, their usage, and the factors that determine their value.
To provide students with the tools and skills to quantitatively and quantitatively analyse risk exposure in a given situation, and devise and critically evaluate strategies to manage such exposure.

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.

1. Introduction to risk, risk measurement, and risk management.
2. Managing bond portfolios: duration, convexity, immunization, yield curve
3. Hedging with futures: cash-and-carry pricing, hedge ratio
   3A. special cases: index futures, F/Z futures.
   4.1. Options - foundations: contract specifications, the "Greeks", basic strategies.
   4.2. Options - pricing: binomial model, martingale measure, delta hedging.
   4.2.A. towards Black-Scholes: matringale pricing.
   4.3. Options - strategies.
   4.4. Options - advanced: implied volatility, delta/gamma, exotic options.
4. Interest-rate derivatives: forward rates, swaps, caps/floors
   5A. Other derivatives.
5. Value-at-risk.
6. Selected topics.

Learning outcomes

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

- Define and explain the characteristics of different types of derivative securities.
- Explain different types of financial risk and use a variety of tools to quantify such risks in real world situations.
- Use data to estimate or calibrate the parameters of models that describe the dynamics of risk factors.
- Compute the price of derivative securities and construct strategies to hedge the risks involved in writing these.
- Devise, using derivatives, strategies to manage or hedge a given risk exposure and analyse its properties.
- Analyse and interpret financial market or corporate data with a view to quantifying and modelling uncertainty.
- Use a variety of software tools to implement pricing and risk management solutions.
- Apply statistical techniques to time series and/or crosssectional data to analyse and quantify risk.
- Transform the results of a quantitative risk analysis into a report usable by a nonquantitative audience (in other words, produce a risk report for the back office.)

Indicative reading list

Core textbook:
Hull, J.C.: Options, Futures and Other Derivatives (Pearson).
Additional:
Hull, J.C.: Risk Management and Financial Institutions (Pearson).
Chance, D.M. and R. Brooks: An Introduction to Derivatives and Risk Mgt. (Thomson).
Jarrow, R. and S. Turnbull: Derivative Securities (Thomson).
Jorion, P.: Financial Risk Manager Handbook (Wiley).

Subject specific skills

Construct and implement hedging and risk management portfolios.
Compute the values and exposure characteristics (Greeks) of a variety of derivative instruments.

Transferable skills

Qualitatively analyse the risk profile of a given corporate situation and identify the key risk factors.
Design, using a wide range of financial instruments, strategies to hedge and/or manage risk exposure for
(a) corporations (buyers of such risk management), and (b) financial institutions (writes of such products).
Build and calibrate mathematical models to describe, analyse and quantify risk in a given situation.
Communicate effectively the results of a risk analysis and proposed risk management solution.

Study

Study time

Type	Required
Lectures	10 sessions of 2 hours (13%)
Seminars	9 sessions of 1 hour (6%)
Private study	47 hours (31%)
Assessment	74 hours (49%)
Total	150 hours

Private study description

Private Study.

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 D2

	Weighting	Study time
Group Project	12%	9 hours
Written Assignment 750-1000 word.	20%	15 hours
Online Examination Exam ~Platforms - AEP	68%	44 hours

- Students may use a calculator

Feedback on assessment

my.wbs, verbal feedback in lectures/revision sessions.

Past exam papers for IB359

Availability

Pre-requisites

To take this module, you must have passed:

- Any of
  - IB235-12 Finance 1: Financial Markets
  - IB253-15 Principles of Finance 1

Courses

This module is Optional for:

- UIBA-MN34 Law and Business Four Year (Qualifying Degree)
  - Year 3 of MN34 Law and Business Studies Four Year (Qualifying Degree)
  - Year 4 of MN34 Law and Business Studies Four Year (Qualifying Degree)
- UECA-3 Undergraduate Economics 3 Year Variants
  - Year 3 of L100 Economics
  - Year 3 of L100 Economics
  - Year 3 of L100 Economics
  - Year 3 of L116 Economics and Industrial Organization
  - Year 3 of L116 Economics and Industrial Organization
- UECA-4 Undergraduate Economics 4 Year Variants

    - Year 4 of L103 Economics with Study Abroad
    - Year 4 of LM1H Economics, Politics & International Studies with Study Abroad
    - Year 4 of LM1H Economics, Politics & International Studies with Study Abroad
    - Year 4 of L114 Industrial Economics with Study in Europe
- UECA-LM1D Undergraduate Economics, Politics and International Studies
    - Year 3 of LM1D Economics, Politics and International Studies
    - Year 3 of LM1D Economics, Politics and International Studies
- Year 3 of UIBA-MN31 Undergraduate Law and Business Studies
- UIBA-MN32 Undergraduate Law and Business Studies
    - Year 3 of MN32 Law and Business Studies (Four-Year)
    - Year 4 of MN32 Law and Business Studies (Four-Year)
- Year 5 of UIBA-MN37 Undergraduate Law and Business Studies (Qualifying Degree) with Intercalated Year
- UIBA-MN35 Undergraduate Law and Business Studies with Intercalated Year (3+1)
    - Year 3 of MN35 Law and Business Studies with Intercalated Year (3+1)
    - Year 4 of MN35 Law and Business Studies with Intercalated Year (3+1)
- Year 5 of UIBA-MN36 Undergraduate Law and Business Studies with Intercalated Year (4+1)
- USTA-G300 Undergraduate Master of Mathematics,Operational Research,Statistics and Economics
    - Year 3 of G300 Mathematics, Operational Research, Statistics and Economics
    - Year 4 of G300 Mathematics, Operational Research, Statistics and Economics
- Year 3 of UMAA-GL11 Undergraduate Mathematics and Economics
- Year 4 of UECA-GL12 Undergraduate Mathematics and Economics (with Intercalated Year)

This module is Unusual option for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics
    - Year 3 of V7ML Philosophy, Politics and Economics (Tripartite)
    - Year 3 of V7ML Philosophy, Politics and Economics (Tripartite)
    - Year 3 of V7ML Philosophy, Politics and Economics (Tripartite)

This module is Option list A for:

- Year 4 of USTA-G300 Undergraduate Master of Mathematics,Operational Research,Statistics and Economics
- Year 5 of USTA-G301 Undergraduate Master of Mathematics,Operational Research,Statistics and Economics (with Intercalated

This module is Option list B for:

- USTA-Y602 Undergraduate Mathematics,Operational Research,Statistics and Economics
    - Year 3 of Y602 Mathematics,Operational Research,Stats,Economics
    - Year 3 of Y602 Mathematics,Operational Research,Stats,Economics

This module is Option list G for:

- UPHA-V7ML Undergraduate Philosophy, Politics and Economics

- Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
- Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)
- Year 2 of V7ML Philosophy, Politics and Economics (Tripartite)