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# Actuarial Education and ERM in the UK



# Topics Today

- Actuarial education in the UK
- ST9 (the UK Profession's ERM exam)

# About Me

- Fellow of the Institute of Actuaries
- Professor of Actuarial Science
- Member of syllabus development group for ST9 (Enterprise Risk Management Subject)
- Examiner for the profession...
- ...and teach ST9 at the University of Kent

# The UK Actuarial Education Structure

- Four stages:
  - Core Technical (CT)
  - Core Applications (CA)
  - Specialist Technical (ST)
  - Specialist Applications (SA)
- Early subjects designed to give theoretical grounding...
- ...and designed to test knowledge
- Later subjects about application of knowledge in complex scenarios...
- ...and operation in particular regimes
- For Fellowship, 3 years work experience needed

# Core Technical

- 9 Subjects
  - CT1 Financial Mathematics
  - CT2 Finance and Financial Reporting
  - CT3 Probability and Mathematical Statistics
  - CT4 Models
  - CT5 Contingencies
  - CT6 Statistical Methods
  - CT7 Business Economics
  - CT8 Financial Economics
  - CT9 Business Awareness Module
- Passes in all required
- CT1-CT8 examined by 3 hour exam
- CT9 examined by 2 day residential course plus post-course exam

# Core Applications

- 3 Subjects
  - CA1 Actuarial Risk Management
  - CA2 Model Documentation, Analysis and Reporting
  - CA3 Communications
- Passes in all required
- CA1 examined by 2x3 hour exams
- CA2 requires attendance at 2 day residential course plus assessed data handling
- CA3 examined by 2 day residential course plus assessed presentation (previous alternative of examination being phased out)

# CA & CT Completion

- Completion of the CA and CT examinations gives technical skills needed to be an actuary...
- ...so there is an option to register as an Associate of the Institute (AIA) or Faculty (AFA) at this stage
- This is a generalist actuarial qualifications...
- ...and holders are referred to as actuaries

# Specialist Technical

- 9 Subjects
  - ST0 Alternative Specialist Technical
  - ST1 Health and Care
  - ST2 Life Insurance Specialist Technical
  - *[ST3 General Insurance – no longer available]*
  - ST4 Pensions and Other Benefits
  - ST5 Finance and Investment A
  - ST6 Finance and Investment B
  - ST7 General Insurance: Reserving and Capital Modelling
  - ST8 General Insurance: Pricing
  - ST9 Enterprise Risk Management
- Passes from 2 subjects needed
- All except ST0 examined by a 3 hour exam



# ST0

- Awarded for alternative study
- Examples
  - MSc in relevant subjects
  - Alternative professional qualification
- Approval for exemption must be sought before study commences
- *Not an easy alternative!*

# Specialist Applications

- 7 Subjects
  - SA0 Research Dissertation
  - SA1 Health and Care
  - SA2 Life Insurance
  - SA3 General Insurance
  - SA4 Pensions and other Benefits
  - SA5 Finance
  - SA6 Investment
- All except SA0 examined by a 3 hour exam
- One pass required
- Knowledge of equivalent ST generally assumed...
- ...but ST not required

# SA0

- Awarded for research carried out with approval of the profession...
- ...but not available for any research carried out as part of any previous qualification

# UK Practice Modules

- Passes in CTs, CAs, STs and SAs...
- ...plus sufficient work experience (3 years, recorded in work based skills log)...
- ...allows an individual to become a Fellow of the Institute (FIA) or Faculty (FFA)
- However, to hold reserved role (e.g. Pension Scheme Actuary), UK practice module also needed

# Education approach

- Traditional approach is distance learning and self-study
- Employees typically given one day a week off for study...
- ...to supplement time taken in evenings and on weekends
- Core reading supplied by the profession...
- ...supplemented by materials from ActEd

# ActEd

- Owned by BPP
- Provides
  - Additional study materials
  - Question and answer banks
  - Marking
  - Revision/tutorial courses
- Close relationship with the profession...
- ...in return for guaranteeing to provide materials for all subjects, no matter how few students

# Universities – overview

- Increasing amount of education provided by universities
- Partly in response to external review of the profession (“Morris review”) highlighting benefit to the profession of greater external influence
- Exemptions from some subjects had been widely available anyway (e.g. exemption from economics subject for an economics degree)
- Scope of degrees now much greater

# Actuarial Science Degrees

- 20+ universities in the UK have courses with exemptions...
- ...from 1 CT...
- ...to all examined CTs and CAs and 2 STs
- Exemptions from SAs not available
- Three types of degree:
  - BSc
  - Postgraduate diploma
  - MSc



# Actuarial Science Degrees

- BSc
  - 3-year course
  - Exemptions up to all CTs
  - Offered by largest number of universities
  - Sometimes offered as sandwich course
- Postgraduate diploma
  - 1-year course
  - Entry usually requires numerate first degree
  - Same exemptions as BSc (up to all CTs)
- MSc
  - 1-year course
  - Postgraduate diploma or Act Sci BSc required
  - Exemptions up to all CAs and two STs...
  - ...but all CA exemptions often not available
  - Other work-related modules also available

# Traditional vs Universities

- Traditional approach allows students to gain valuable workplace skills whilst studying...
- ...and part-qualified students from the traditional route more “useful”...
- ...but traditional route can takes longer than degree route (BSc anyway)...
- ...and universities can use a wider range of assessment techniques
  - Presentations
  - Group work
  - Projects

# ST9

- New enterprise risk management course
- Will provide eligibility for CERA qualification
- Very broad subject
  - External risk frameworks
  - The ERM process
  - Risk classification
  - Risk measurement
  - Quantitative analysis of time series
  - Modelling techniques
  - Responses to risk
  - Economic capital
  - Case studies

## ST9 – External frameworks

- Mandatory (e.g. Basel II)
- Advisory (e.g. COSO, AS.NZS 4360)
- Proprietary (e.g. credit rating agencies)

# ST9 – The ERM Process

- Stakeholders
- Context
- Risk appetite
- The risk management function
- Strategy
- Control cycles

# ST9 – Risk Classification

- Full taxonomy
- Important as basis for rest of course

# ST9 – Risk Measurement

- VaR
- Tail VaR
- Time horizon
- Related issues

# ST9 – Models and Quantitative Analysis

- Degree to which modelling possible
- Risk identification
- Stress testing
- Stochastic analysis
- Statistical distributions, copulas
- Tail risk
- Extreme value theory
- Very technical



# ST9 – Responses to Risk

- Transferring
- Modifying
- Diversifying
- Hedging
- Accepting (including residual risk)

# ST9 – Economic Capital

- Capital allocation...
- ...and some complex maths!

## ST9 – Case Studies

- Difficult to carry out case studies of when risks managed well...
- ...so most case studies of failures!

# Examining ST9

- Examination questions
  - Bookwork – lists of factors (e.g. “what makes a good model?”), calculations (e.g. probabilities under joint distributions copulas)
  - However, more detailed scenarios more useful – “a risk manager is considering a new product...”; “a pension scheme is considering how to manage risks to which it is exposed”; etc...
- Projects
  - Review risk management statements in company accounts
  - Review risk management failures
  - Design risk management structures
- Presentations on projects

# Who needs ST9?

- All actuaries!
- Useful for any actuary managing risk...
- ...who wants to expand area of influence beyond traditional actuarial fields
- Also useful as CROs becoming more important...
- ...particularly if CRO becomes a regulatory requirement...
- ...and an appropriate qualification is needed