

Actuarial Education and Research in Hong Kong

Introduction

Actuaries apply mathematical and statistical methods to solve business problems in finance and insurance fields, especially in the area of assessment and management of risk. In order to design appropriate solutions to these problems, actuaries need to possess strong background knowledge in diverse areas such as probability, statistics, accounting, finance and economics. Basic education in these disciplines is usually provided by universities. However, actuarial education encompasses an even broader scope including practical experience to provide actuaries with adequate skills to answer questions that involve complex and uncertain situations. Besides the academic topics covered in traditional university courses, actuaries will need to develop understanding and practical experience in communication, computer and other business skills.

Basic actuarial knowledge has been built upon a rigorous application of the theory of probability and statistics. As a scientific discipline, actuarial science in general has been standardized both in terms of content and notation around the world. However, as actuarial techniques are being applied to business problems, modification and adaptation are essential to reflect the legal, social and economic environment of the specific country. An actuary's education will include a thorough understanding of the operational aspects of his chosen specialty and how the external factors affect his work in that practice area.

The progress of the actuarial profession relies on the successful application of actuarial theory to provide effective and efficient solution to practical business problems. The integration of theory and practice involves theoretical development through research on new problems encountered in practice.

An actuary is a professional and must always act with integrity, due diligence, competence in giving advice. He must also consider the interest of all parties affected by the professional advice. In order to maintain the high respect that the actuarial profession has already earned, education for actuaries must ensure that professionalism is emphasized at all times.

Professional Organizations

In order to be recognized as a professional to provide actuarial service, actuaries must be qualified by passing actuarial examinations and / or completing other requirements specified by the actuarial organizations in the country where they want to practice. Currently, there are no local actuarial examination requirements for actuaries to practice in Hong Kong. Actuaries in Hong Kong have obtained their actuarial designations by fulfilling examination requirement of overseas professional organizations such as:

- Casualty Actuarial Society (US)
Suite 250
4350 North Fairfax Drive
Arlington, Virginia 22203
U.S.A.
Tel: (1) 703 276 3100
Fax: (1) 703 276 3108
Email: office@casact.org
Website: www.casact.org

- Faculty of Actuaries (Scotland, UK)
 Maclaurin House
 18 Dublin Street
 Edinburgh EH1 3PP
 Scotland
 Tel: (44) 131 240 1300
 Fax: (44) 131 240 1313
 Email: faculty@actuaries.org.uk
 Website: www.actuaries.org.uk

- Institute of Actuaries (England, UK)
 Napier House
 4 Worcester Street
 Oxford OX1 2AW
 England
 Tel: (44) 1865 268 200
 Fax: (44) 1865 268 211
 Email: institute@actuaries.org.uk
 Website: www.actuaries.org.uk

- Institute of Actuaries of Australia
 Level 7, Challis House
 4 Martin Place
 Sydney 2000
 Australia
 Tel: (612) 9233 3466
 Fax: (612) 9233 3446
 Email: actuaries@actuaries.asn.au
 Website: www.actuaries.asn.au

- Society of Actuaries (US.)
 Suite 600
 475 North Martingale Road
 Schaumburg, Illinois 60173-2226
 U.S.A.
 Tel: (1) 847 706 3500
 Fax: (1) 847 706 3599
 Email: webmaster@soa.org
 Website: www.soa.org

These actuarial designations are all recognized in Hong Kong for regulatory purposes. As actuaries practicing in Hong Kong, they will be required to comply with the local legislative rules and professional standards. Broadly speaking, there will not be any difference due to the country where the actuarial qualification is obtained. The professional examinations administered by the above organizations are considered to meet the highest standard of the actuarial profession.

The examination syllabus differs slightly among the above professional organizations. The Casualty Actuarial Society focuses its examinations on property and casualty insurance topics which include fire, accident, medical malpractice, worker's compensation and personal injury

liability. The other professional organizations administer examinations that cover subjects in life insurance, pension, health insurance, investment, finance and risk management. General insurance topics are also included in the Australian and UK's examinations. Regarding the format of examinations, essay type questions are more widely adopted in the professional organizations of Australia and UK. On the other hand, the US examinations are mostly in multiple-choice and short essay format. Besides core technical actuarial topics and applications, all the professional organizations also require actuaries to pass examinations or attend seminars in professionalism.

In view of the significant growth of the insurance market in Mainland China, there is currently a huge demand of actuarial personnel. Some actuaries have already relocated to take up actuarial positions in various cities in Mainland China. To prepare for actuarial work in Mainland China, some actuarial students are writing the actuarial examinations administered by the Chinese Insurance Regulatory Commission. Since 2002, the ASHK has received approval from the Chinese Insurance Regulatory Commission to set up a Chinese actuarial examination centre in Hong Kong. For the Hong Kong Examination Centre, part of the Associateship and Fellowship courses are offered to candidates from Hong Kong, Taiwan and elsewhere.

Continuing Professional Development

As the business environment has been constantly changing, actuaries must keep updated on the progress in the industry that has been developed to cope with the changes. Continuing Professional Development is defined by the ASHK in the Actuarial Guidance Note No. 6 as the maintenance, improvement and broadening of knowledge and skill and the development of the personal qualities necessary for the execution of professional and associated technical duties throughout the actuary's working life.

Actuaries must understand that they need to continue educating themselves in order to maintain the highest standards to provide actuarial services in a professional manner. The actuarial profession throughout the world has encouraged the interchange of professional information through publication and discussion of papers, seminars and conferences.

As members of overseas actuarial organizations, actuaries may already be required to undertake continuing professional development activities in accordance with the professional organization's rules. However, actuaries practicing in Hong Kong must also undertake a reasonable amount of continuing professional development that is directly related to the Hong Kong market. It is the responsibility of every actuary to satisfy himself that he has undertaken continuing professional development sufficiently to ensure that he can meet the competency standards to provide professional actuarial services in his practice area.

Actuarial Education in Hong Kong

Becoming a fully qualified actuary requires passing a series of rigorous examinations which usually takes several years to complete. In Hong Kong, most study takes place both during employment and in a university setting. During employment, self-study and then sitting for the professional actuarial examinations with their own paces is the core mode of advancement in actuarial educational achievement. In education setting, there are two universities providing undergraduate degree programmes in actuarial science. They are the Chinese University of Hong Kong (CUHK) and the University of Hong Kong (HKU). They offer students various actuarial science courses helping them to prepare for some of the actuarial examinations held by the Society of Actuaries (SOA) or the Casualty Actuarial Society (CAS). In light of the success

in terms of student quality and job prospects of the actuarial science degree programmes, City University of Hong Kong and the Hong Kong Polytechnic University begin to run similar courses or programmes recently. Details of these programmes can be found in the following websites:

- Department of Applied Mathematics, The Hong Kong Polytechnic University - www.polyu.edu.hk/~ama
- Department of Finance, The Chinese University of Hong Kong - www.baf.cuhk.edu.hk/fin
- Department of Mathematics, City University of Hong Kong - www.cityu.edu.hk
- Department of Statistics and Actuarial Science, The University of Hong Kong - www.hku.hk/statistics

The actuarial science undergraduate degree programmes admit top quality Form 7 (JUPAS) students. The average admission grade of these programmes was rated at the top notch among all tertiary study programmes. The actuarial programmes also attract many Form six students through the Early Admission Scheme, non-JUPAS students and assorted scholarship holders from top universities in Mainland China.

The university programmes have exemption arrangements through Validation by Education Experience (VEE) with the Casualty Actuarial Society and the Society of Actuaries. Some of them also have exemption arrangements with the Institute of Actuaries (England). Apart from exemption, the two undergraduate programmes offer both exchange opportunities to students to study at world renowned universities and internship opportunities with major companies in Hong Kong.

Actuarial Research in Hong Kong

Research on theoretical basis of actuarial science is mainly conducted by academic personnel in the two major universities offering actuarial educational programmes. Lecturers in these programmes have many years of teaching and research experience in actuarial science, and have strong academic and professional qualifications such as Fellow or Associate of the Society of Actuaries. Many actuarial articles have been published on various top journals in the field of actuarial science. The universities also have actuarial researchers from other universities in Mainland China and abroad as regular visitors to exchange research information.

Research on practical topics has also been conducted by practicing actuaries and their research findings are usually delivered in the conferences and seminars organized by the Actuarial Society of Hong Kong and / or other actuarial organizations. The Actuarial Society of Hong Kong has also been conducting mortality studies for the Hong Kong insurance industry. The following list provides brief description of the research projects undertaken by the Actuarial Society of Hong Kong, the Chinese University of Hong Kong and the University of Hong Kong.

ASHK Research Projects:

- Experience Studies' Reports
 - HK Dollars Yield Curve
- and others

CUHK Research Projects:

- The Lee-Carter Model for Forecasting Mortality Revisited, (January 2007).

- Direct Derivation of Finite-Time Ruin Probabilities in the Discrete Risk Model with Exponential or Geometric Claims, (December 2006).
- Mixture Gaussian Time Series Modelling of Long-Term Market Returns, (December 2005).
- Some Non-linear Threshold Autoregressive Time Series Models for Actuarial Use, (December 2004).

HKU Research Projects:

- Analyses of insurance risk models with dividend payments
- Risk theory for insurance risk models with stochastic return on investments
- Ruin analyses of two insurance risk models
- Analyses of correlated aggregate claims in a book of insurance business
- Parametric survival models for mortality tables
- Value at risk and expected shortfall under a model with market and credit risk
- On the joint distribution of surplus prior and after ruin
- Optimal asset allocation problems under the discrete-time regime-switching model
- A study of the optimal investment strategy for insurance portfolio
- Risk measures in finance and insurance
- Investment risk related problems in actuarial science
- Insurance and financial risks: actuarial science approaches
- Some actuarial science and finance problems under Markovian regime switching models
- Actuarial science and finance models with dependent risks
- Embedded options in insurance products and optimal policies for insurance portfolios under Markovian regime switching models

Disclaimer

The Education Corner is aimed at providing background information on some hot topics surrounding actuarial practice and the insurance industry, and is solely intended for actuarial education purpose, and must not be relied upon for any other purpose. In putting together the respective sections the contributors have relied on publicly available information without independent verification, apart from reviewing some of the material for reasonableness based on the contributors' knowledge of the actuarial field and insurance industry.

ASHK Education Committee
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