



ACTUARIAL ... A CAREER WITHOUT BOUNDARIES

Prepared by the Singapore Actuarial Society, this booklet aims to inform the reader of the various means to pursuing an Actuarial profession. We hope this booklet, together with its extensive links to web sites, will be helpful for readers who wish to pursue the profession.

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1. AN INTRODUCTION TO ACTUARIES

WHAT is an ACTUARY?

An actuary is a financial services professional who advises clients on matters which involve management of the risks of future financial events which cannot be predicted with certainty.

The traditional clients of an actuary are:

- Life insurance companies
- General (or non-life) insurance companies
- Pension (or retirement) funds
- Reinsurance companies.

Actuaries have served these clients through either a consulting practice or through direct employment.

However, actuaries are now employed by a wide range of institutions including consulting firms, investment houses, banks and government. These institutions recognise the actuaries' skills in building financial models and using them to help their clients to make financial decisions which are prudent, while maintaining competitiveness.

An actuary is a professional and, in giving advice, must always act with integrity, due diligence, competence and in the interest of all parties affected by his or her professional advice.

WHAT is ACTUARIAL SCIENCE about?

Actuarial science is a study combining the elements of business, economics and mathematics, thus allowing decision-making based on informed assumptions and estimations.

Practitioners of Actuarial Science are called actuaries. Armed with an arsenal of statistical and risk management skills, topped off by a strong business sense and knowledge of economics, actuaries venture into the territories of unpredictability and market volatility. They aim to shed some light on the uncertain future and to eliminate, or, at the very least, mitigate any financial misfortunes that individuals or corporations are susceptible to.

Associations exist worldwide in which aspiring actuaries can enrol as students and move up the hierarchy by clearing examinations. The syllabus differs slightly between associations from different countries, so it is crucial to check the list of recognized associations in later pages. Upon passing all required examinations and satisfying the particular association's (if any) additional criteria, one may become a *Fellow*, a *fully-qualified actuary*.

It is not absolutely necessary to begin this path by signing up with these associations. There are educational institutions worldwide which have integrated the actuarial syllabus (in part) into various diplomas, undergraduate degrees and postgraduate degrees. Each institution will adopt the syllabus and exam structure of a particular association.

Locally, Nanyang Technological University follows the syllabus as set out by the Institute of Actuaries, UK. The National University of Singapore follows the syllabus by the Institute of Actuaries, Australia. Singapore Management University follows the syllabus set out by the Society of Actuaries, US. Passing the examinations in University *does not* equate to passing the examinations set by the associations. However, should a student clear any examination with sufficiently high grades, exemptions may be granted by the respective association for that particular examination in future.

“*In future?*” you may ask.

Yes. Universities typically *do not* offer the entire Actuarial syllabus in their degrees. Only a part of the syllabus is offered together with (varying between different universities) business studies, commerce etc. A graduate is normally still relatively far from achieving *Fellowship*. The climb to becoming an actuary continues by enrolling in the recognised association by which one was awarded the exemption(s) and striving to pass the rest of the examinations, usually juggling between work and study.

The APPEAL of the ACTUARIAL PROFESSION

Dynamic working environment

Actuaries are involved in almost every financial aspect of business, including development of new products and services, investment management, marketing, administration, and general management responsibilities.

In a fast-changing world, with new risks and the need for more creative ways to tackle them, the working environment of an actuary is dynamic. The profession is intellectually challenging and gives the actuary a great sense of achievement.

Not restricted to any industry

The skills and talents actuaries can offer do not just reside in one single industry. Because actuarial skills are so readily transferable to any business that deals with risk, an actuary can work in many industries such as insurance, banking and finance, marketing, broking and fund management.

Career advancements

Because their judgement is heavily relied upon, a significant percentage of actuaries employed with insurance companies achieve senior management positions.

Highly respected

Actuaries are key players in the management team, bringing a unique perspective to assist in the growth of the business. Because of the importance of their work, actuarial science is a profession that is respected throughout the business community.

Attractive remuneration

In Singapore, the starting base salary salaries for actuarial graduates may be about \$3,000 per month on average. Upon obtaining a Fellowship from a recognised actuarial association, with work experience, actuaries may earn in excess of \$120,000 a year.

Scholarship and Internship Program

Some associations in Singapore offer scholarship and internship programmes to assist graduating students in pursuing an insurance career, including actuarial science. Please contact the following associations for more information:

- Insurance Executive Scholarship Program (IESP) by Singapore College of Insurance
www.scicollege.org.sg/IESP
- Global Internship Program (GIP) by General Insurance Association
<http://www.gia.org.sg/gip>

2. WHERE ARE THE AREAS OF DEMAND FOR ACTUARIES?

Actuaries are generally employed in sectors related to finance and risk management. Traditionally, the largest demand for actuarial skills come from life insurance companies, general (or non-life) insurance companies, pension (or retirement) funds companies, reinsurance companies, consulting firms and government.

Actuarial skills are also applicable in many other fields!

Insurance Companies

When working for a life and/or general insurance company, an actuary is primarily responsible for the management of the financial condition of the company. He or she has to ensure that the company has sufficient assets and reserves to meet the potential liabilities of the company. He or she must also be concerned that the products of the company are designed and priced so that it will always be likely to meet its obligations. Actuaries (called Appointed Actuaries for life companies and Certifying Actuaries for general insurance companies) also have statutory duties under the Insurance Act.

Reinsurance Companies

Actuaries working for reinsurance companies are mainly concerned with the analysis and pricing of insurance risks (e.g. mortality, claim rates). They deal with clients, which are life and/or general insurance companies, to arrange reinsurance contracts which allow these companies to manage their risks by sharing these risks with the reinsurance companies. In Singapore, reinsurers tend to have clients in several countries.

Consultancies

Actuaries engaged by actuarial consultancy firms provide actuarial services to life and general insurance companies which may have insufficient actuarial expertise internally. They also advise other financial institutions and pension funds in management of future financial risks. In recent years, computation of shareholder values for mergers and acquisitions of insurance companies, in particular, has generated demand for their services.

Others

Other than pension funds, banks and investment companies, actuaries may also move into academia, or even set off in totally new directions like management, marketing and system development work lending their unique understanding of financial risks to these areas.

3. WHERE CAN I FIND EMPLOYMENT IN SINGAPORE?

Below is a list of employers of our members in the Singapore Actuarial Society. This list is not exhaustive.

NON-EXHAUSTIVE LIST OF ACTUARIAL EMPLOYERS OF SAS MEMBERS

DIRECT LIFE INSURANCE

AXA Life
Manulife
Prudential Assurance
Swiss Life
The Great Eastern Life
Tokio Marine Life
Zurich Life

DIRECT GENERAL INSURANCE

ACE Insurance
AIG Asia Pacific Insurance
Allianz Insurance
AXA Insurance
Cigna International
Liberty Insurance
MSIG Insurance
QBE Insurance
Remark Singapore
Royal & Sun Alliance
Tokio Marine Insurance
Zurich Insurance

COMPOSITE INSURANCE

AIA Singapore
Aviva Limited
HSBC Insurance
NTUC Income

ACADEMIA

Nanyang Technological University
National University of Singapore
Singapore Management University

BROKERS

AonBenfield
Guy Carpenter
Willis

REGULATOR

The Monetary Authority of Singapore

REINSURANCE

Allianz SE
Asia Capital Reinsurance
Aspen Insurance UK
Berkley Re
Endurance Specialty Insurance
General Reinsurance AG
Hannover Re
Pacific Life Re
Partner Re
RGA Reinsurance
MS Frontier Re
Munich Reinsurance
Scor Global Life SE
Swiss Reinsurance
Tokio Marine Retakaful
XL Re

CONSULTANCY

Barrie Hibbert
Deloitte
Ernst & Young
KPMG
Mazars
Mercer
Milliman
NMG
Pricewaterhouse Coopers
Towers Watson

BANKS / ASSET MANAGEMENT

Barclays Capital
BNP Paribas
DBS Bank
Deutsche Bank
OCBC Bank
Standard Charter Bank

4. BECOMING AN ACTUARY ... WHAT QUALITIES SHOULD I POSSESS AND HOW DO I START?

What QUALITIES should I POSSESS?

To begin with, you should have a strong liking and aptitude for mathematics and enjoy problem solving and working with numbers. Academically you will need to be strong in all round subjects but very strong in mathematics.

You should also possess curiosity and be well-read on issues relevant to business and social trends. Other soft skills such as initiative, teamwork, and communication will also prove to be useful in your actuarial career.

How do I START?

To function as an actuary in Singapore, you must be a Fellow of one of the recognized actuarial associations. To attain Fellowship, you will have to pass all the examinations set by the association and attend a course on professionalism. The Singapore Actuarial Society is not an examination body and does not offer any actuarial examinations.

It is not necessary to possess an official degree from a university to be an actuary. The core syllabus is administered by the various actuarial institutes worldwide and it is the examinations from these institutes that aspirants should be concerned with.

Here are some ways you could start:

#1 Actuarial degree or post-graduate course

- Enrol in a university offering a degree or post-graduate degree related to actuarial science.
- Obtain sufficiently high grades for all actuarial exams (the course may contain subjects pertaining to other areas like business, commerce etc)
- Apply for exemptions for the examinations through the university.
- Upon graduation, one will have to enrol in a recognized institute/society and continue as per #3

#2 Non-actuarial graduates

Since it is **not necessary** to possess a degree related to actuarial science in order to pursue a Fellowship in the Institute/Society, one may pursue other degrees and thereafter enrol as a student of an institute and proceed as #3 (albeit without exemptions as in #1). We do have examples of people qualifying without pursuing a degree but who start work straightaway and pursue the professional exams.

#3 While working

- Enrol in a recognized institute, obtain course materials.
- Apply to sit for examinations.
- Await results, retake if necessary.
- Proceed to tackle further examinations.

This is when the real challenge begins! Most employers provide study aid to actuarial students working for them, in terms of study leave and financial incentives for passing the examinations.

5. WHAT WILL MY CAREER PATH BE LIKE AS AN ACTUARY?

When you first embark on an actuarial career, you will normally be assigned to design and run financial models to generate data and information which will allow the actuary to formulate his or her advice. Computer skills, especially in using spreadsheets, are extremely useful.

You can start in one of many areas - product development, reserving, financial projection, analysis of risks - and will usually move around to gain an all-round exposure.

As you pass your examinations and gain experience, you will usually be asked to lead projects, analyze results of the computational work and make recommendations to the actuary.

Upon qualifying as a **Fellow**, many new opportunities are most likely to follow, including branching into other areas of management which may not strictly be actuarial in nature.

There are also actuarial students who have branched off into other fields before qualifying as **Fellow**, but putting their actuarial foundation into good use, nevertheless.

As the market grows further, we can expect demand for actuaries to increase even faster. Overseas, there are even bigger markets and industries in need of actuaries.

6. WHAT ARE THE RECOGNISED ACTUARIAL ASSOCIATIONS?

RECOGNISED UNDER the SINGAPORE INSURANCE ACT for APPOINTMENT as APPOINTED ACTUARIES

Institute and Faculty of Actuaries *

Website : www.actuaries.org.uk
E-mail : institute@actuaries.org.uk

Society of Actuaries *

Website : www.soa.org
E-mail : webmaster@soa.org

Institute of Actuaries of Australia *

Website : www.actuaries.asn.au
E-mail : insact@actuaries.asn.au

RECOGNISED by the SINGAPORE ACTUARIAL SOCIETY

(In addition to the above)

Canadian Institute of Actuaries

Website : www.actuaries.ca
E-mail : secretariat@actuaries.ca

Casualty Actuarial Society *

Website : www.casact.org
E-mail : office@casact.org

* Although the Singapore Actuarial Society itself does not offer any actuarial examinations, you can sit for the examinations of these associations in Singapore. However, you may need to travel abroad to attend certain mandatory courses or seminars (e.g., Professionalism course) organised by these associations. Some associations have started to offer Professionalism courses through a web-based platform. Students are advised to understand the available options before enrolling in a professionalism course.

Recognised by the Monetary Authority of Singapore for purposes of Certifying the Loss Reserves of General (Non-Life) Insurance Companies.

7. WHAT ARE THE CURRICULUM AND EXAM SYLLABUS LIKE?

PROFESSIONAL EXAMINATION SYLLABUS

The examinations of the recognised actuarial associations may be found through these links:

Institute & Faculty of Actuaries (UK)	http://www.actuaries.org.uk/students/pages/syllabus-exams
Institute of Actuaries (Australia)	http://www.actuaries.asn.au/EducationandProfessional/Education/PathwayFellowship.aspx
Society of Actuaries (US)	http://www.soa.org/education/exam-req/edu-fsa-req-2013.aspx
Casualty Actuarial Society (US)	http://www.casact.org/admissions/syllabus/index.cfm?fa=exam_rules#order

8. WHICH UNIVERSITIES OFFER A STRUCTURED COURSE ON ACTUARIAL SCIENCE?

UNIVERSITIES OFFERING ACTUARIAL SCIENCE

Singapore

Nanyang Technological University
<http://www.ntu.edu.sg>

National University of Singapore (jointly with Australian National University)
http://www.fas.nus.edu.sg/ecs/undergraduate/anu_nus.html

Singapore Management University
<http://smu.edu.sg/>

United Kingdom

City University, London
<http://www.city.ac.uk/actuarial>

Heriot Watt University, Edinburgh, Scotland
<http://ww.ma.hw.ac.uk/ams.html>

Kent University, Canterbury
<http://www.kent.ac.uk>

London School of Economics, London
<http://www.lse.ac.uk>

Swansea University
<http://www.swan.ac.uk>

Southampton University
<http://www.soton.ac.uk>

Warwick University
<http://www.warick.ac.uk>

Australia

Macquarie University (Sydney)
<http://www.actuary.mq.edu.au/index.shtml>

University of New South Wales (Sydney)
<http://actuary.web.unsw.edu.au/cgi-bin/index.php>

University of Melbourne (Melbourne)
<http://econ.unimelb.edu.au/actwww/home.html>

Australian National University (Canberra)
<http://ecocomm.anu.edu.au/disciplines/discipline.asp?d=ACST>

Students who obtain degrees in actuarial science or actuarial mathematics from the above universities, with good results can earn exemptions from some or all of the Institute & Faculty Core Technical examinations.

Students who obtain good degrees in mathematics or statistics in these and other universities may obtain exemption from one or two of the Core Technical examinations.

UNIVERSITIES OFFERING ACTUARIAL SCIENCE (cont'd)

United States of America and Canada

There are a number of American and Canadian universities which offer actuarial science, either as full courses or as elective subjects.

Please contact the United States Embassy or the High Commission of Canada for more information.

The Society of Actuaries, the Canadian Institute of Actuaries and the Casualty Actuarial Society do not, as a rule, offer exemptions from their examinations.

9. THE SINGAPORE ACTUARIAL SOCIETY

A Brief HISTORY of the SOCIETY

The Singapore Actuarial Society was formed in 1976. At that time, the profession was little known in Singapore and there were only a handful of qualified actuaries. The adoption of the new Constitution in July 1996 and the Code of Professional Conduct in November 1997 is the fruition of efforts made in the past two decades to promote the study of actuarial science and professional standards.

The Society is the recognised representative body of the actuarial profession in Singapore, having the final authority in setting professional standards. The objectives of the Society are:

- To uphold the highest professional standards among members;
- To promote the study, discussion, publication and research into the application of economic, financial and statistical principles to practical problems, the actuarial, economic and allied aspects of life assurance, general insurance, employee retirement benefits, finance and investment with particular reference to Singapore and the ASEAN region;
- To assist students in the course of their actuarial studies, and
- To foster and encourage social relationship among the members.

INTERNATIONAL ACTUARIAL ASSOCIATION

In July 2003, the Singapore Actuarial Society was accepted as a Full Member of the IAA.

Information on the IAA can be found on their website: www.actuaries.org

ACTIVITIES organised by the Society

The Society organises the following activities for the benefit of members:

- Actuarial seminars and conferences , both on a local and on a regional scale
- Regular Actuarial Forums , for distinguished speakers in the actuarial field to present topics of interest to members , and for members to discuss and debate actuarial and insurance matters
- Social activities for the members.

The Society also makes representations to the Monetary Authority of Singapore on various issues affecting the profession and the insurance industry. The Society is well represented by members on a number of the MAS working groups.

From time to time, the Society advises industry associations on matters affecting the industry that has actuarial implications.

You may find out more about the Singapore Actuarial Society on www.actuaries.org.sg

THE SAS MEMBERSHIP

Membership Criteria

Persons may be admitted into the Society in one of the five classes:

- (a) **Fellows** – comprising Fellows of recognised actuarial associations who have attained Fellowship of such recognised actuarial association passing or being exempted from examinations, and fulfilling any other requirements, set by that recognised actuarial association and not solely by accreditation through mutual recognition arrangements with other actuarial associations or otherwise. A Fellow shall be entitled to vote, stand for election to Council, and make nominations but only if he is currently residing in Singapore and had been a resident for one (1) year or more on the date the general meeting is held to which the vote, election or nomination pertains.
- (b) **Associates** – comprising Associates of the recognised actuarial associations who have attained such equivalent level as determined by the Council, by passing or being exempted from examinations, and fulfilling any other requirements, set by that recognised actuarial association and not solely by accreditation through mutual recognition arrangements with other actuarial associations or otherwise. An Associate shall be entitled to vote, stand for election to Council (except the position of President and Vice-President), and to make nominations but only if he is currently residing in Singapore and had been a resident for one (1) year or more on the date the general meeting is held to which the vote, election or nomination pertains.
- (c) **Ordinary** – comprising all other members who have passed or been exempted from at least one examination of one of the recognised actuarial associations (or such other professional or educational bodies as may be approved by the Council). Ordinary members shall have no voting rights.
- d) **Affiliate** – comprising individuals, approved by the Council, who do not have any actuarial qualification and are not studying towards an actuarial qualification but where mutual benefit to the individual and to the Society would be realised through membership.

An Affiliate Member shall not be entitled to vote, to make nominations or to stand for election to Council.
- e) **Student** – comprising undergraduate and graduate students of educational bodies, approved by the Council, undertaking full-time courses in actuarial mathematics or actuarial science. A Student Member shall not be entitled to vote, to make nominations or to stand for election to Council. A Student Member shall cease to be a member of the Society upon termination of his course of study, but shall be entitled to apply for membership under any of the other classes above.

Recognised Actuarial Associations:

Institute and Faculty of Actuaries (United Kingdom)
Society of Actuaries (North America)
Institute of Actuaries of Australia
Canadian Institute of Actuaries
Casualty Actuarial Society (North America)

SUBSCRIPTION TO THE SOCIETY

Please refer to <http://www.actuaries.org.sg/?q=membership> for our entry fee and membership subscription.