"Actuarial Education – The Business Element"

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Summary

This paper is a contribution to the current discussion about future developments in actuarial education. The actuarial education systems administered by the Society of Actuaries, the Casualty Actuarial Society and the Faculty and Institute of Actuaries are under review once more, with a view to making further radical changes by 2005. A fundamental objective of the reviews is to broaden the scope of the profession. This paper argues the importance of providing actuaries with business skills, as well as technical actuarial skills, and suggests that future actuaries will be best served by setting much of the training explicitly in a business context.

Keywords

Education, business, actuarial control cycle, professionalism

"Formation en actuariat - Volet affaires"

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Résumé

Le présent document se veut une contribution à la discussion touchant les développements futurs en matière de formation en actuariat. En effet, les programmes d'éducation en actuariat qu'administrent la Society of Actuaries, la Casualty Actuarial Society ainsi que la Faculty and Institute of Actuaries font de nouveau l'objet d'un examen visant à y apporter des changements radicaux d'ici à 2005. L'objectif fondamental de ces examens est d'élargir la portée de la profession. Ainsi dans les pages qui suivent nous insistons sur l'importance de fournir aux actuaires des compétences du domaine des affaires, de même que des compétences techniques en actuariat. Nous suggérons également que les futurs actuaires seront mieux équipés si leur formation est orientée vers les exigences du monde des affaires.

1. Introduction

1.1. The Conference theme is: A New Millennium, A New Challenge for Actuaries. We see the actuarial profession facing many challenges to survive, grow and gain more recognition. Actuaries have to undergo a rigorous examination system to qualify as Fellows but the profession is finding that this training alone is becoming insufficient to hold its position in the market place.

1.2. What is the objective of the profession and how does the actuary fulfil the expectations of the market place? Up to now the majority of actuaries have worked in the traditional fields of insurance and pensions, with investment, finance, health care financing and certain other fields being significant in some countries. Recent initiatives, from the UK profession, the Society of Actuaries and some other associations, have sought to project a much broader role for actuaries as the experts in financial risk and potentially in a range of related areas (termed the Big Tent strategy by the Society of Actuaries). The marketplace is changing as customers expect experts to be flexible, with the ability to solve their problems of the present and anticipate their needs in the future. The profession's code of ethics embodies the actuary's function as serving the public interest. The profession has been publicizing to its members mission statements and statements on its vision and values to clarify its role (Faculty and Institute of Actuaries, 2000).

1.3. Thornton, in his Presidential Address to the Institute of Actuaries (Thornton, 1999), said:

> " . . . we do need to continue to be prepared to take on responsibility, to see duties laid upon ourselves in legislation and to deliver the high standards, the professionalism and the competence that governments expect from us . . .
>
> We should continue to be a learned society. We should make sure that we link better with touching disciplines. We should ensure that the boundaries of actuarial science are being pushed back, but also that the gap between the actuarial scientists and the actuarial practitioners is bridged. We should draw on analogies with science and engineering to help position ourselves."

1.4. The challenges we would like to address in this paper are

- the tendency in the workplace to relegate actuaries to purely "technical roles"
- the mystery of an actuary's work to non-actuaries
- the boundaries with "touching disciplines" that are becoming less distinct
- the opportunities for moving into non-traditional areas of work
- the increasing incidence of litigation

A business-orientated approach to the education process could go a long way towards improving the profession's viability and its ability to increase visibility, understanding and public recognition of actuaries.

1.5. We hope this paper will encourage another area of discussion on training actuaries and the plans to change the education system in 2005 that are now being developed. Our views are based to a large extent on our experience and observations, although they coincide with some of the themes of the discussion papers issued in recent months by the UK professional bodies (Goford et al. 2001) and by the Society of Actuaries (Task Force on Education and Qualification, 2001).

2. How to meet the challenges

2.1. The actuarial membership falls into broad groups: the retired, those active in actuarial work, those who are qualified Fellows but do not practice as actuaries and those who have not attained Fellowship status yet. The needs and perceptions of each group are clearly different and we cannot deal with all the issues in this paper. We will focus on the initial education process, as this is fundamental for ensuring that the next generation of actuaries is better equipped and more easily recognised as experts in providing solutions to a wide range of business problems.

2.2. One of the issues is to give students a good business orientation from the start, particularly for those who have studied for the early parts of the examinations whilst at university. We suggest the introduction of an early orientation course to help the new student to see how and where the technical subjects that they are studying, or are going to study, are applied in practice. It is understood that the design of the actuarial courses will continue to provide a good grounding in the theory. This step is an attempt to bridge the gap between actuarial science and practice. Such a course might also give students an introduction to the business world, corporate and financial structures and help to demystify some of the jargon which they will come across.

2.3. Introducing modules on business skills in the training program would ensure that subjects are taught with an orientation towards practical applications in a business context. The business content would provide evidence to the business community that actuaries are good candidates for senior management positions. If the later stages of the examinations were made more flexible, there could be a role for a business management option for those who want to pursue their actuarial career in the wider fields, rather than in a purely technical actuarial role.

2.4. The traditional closed book, time-constrained examination is not necessarily the best way to test whether a student is well-prepared to apply actuarial skills in real world situations, with appropriate sensitivity to the needs of client or employer and an ability to devise effective business solutions to practical problems. This issue might be addressed by introducing a wider range of study formats and assessment methods, including mentored on-the-job training, projects, intensive seminars involving group work and testing presentation skills and dissertations. The objective is "to be satisfied that students can think laterally and demonstrate their ability to apply their structured knowledge to the solution of relevant problems" (Ferguson, 1997).

2.5. There is still a large proportion of bright candidates who do not succeed in qualifying. The actuarial profession has to compete with related disciplines for the

best candidates and the education reform for 2005 has a role to play in ensuring that these bright candidates are recruited, with a greater certainty of success.

2.6. Work experience is an essential part of the process of qualifying as an actuary. The question is what is considered relevant work experience and what is acceptable to be eligible for qualification. University co-op programs provide work experience at an early stage. This is an ideal time to teach the student how to extrapolate the studying process to the business environment, where

- planning the project,
- designing the model,
- collecting the data,
- formulating the calculations,
- analyzing the results and
- communicating the recommendations

are essential to maintaining the high standard of performance necessary to gain the understanding and respect of the client and of the wider public. It is essential that the internal environment of the workplace is oriented to this process for the co-op program to be a success.

2.7. Those who do not come through co-op programs will start to acquire this exposure to professional work when they get their first job as an actuarial student. Although many employers will have programs to make this a satisfactory learning experience, there may be a role for the profession in requiring employers to deliver a more structured approach to gaining work experience and making this a condition of progression to Associate, and subsequently to Fellow, status.

2.8. Investors are looking for companies with ethical management on the grounds that "ethical business practice is good business" (Ferguson, 1997). The profession has an established code of conduct and standards of practice that are not widely known among the student body and probably still less by most of those outside the profession. As actuaries automatically have this framework for ethical decision-making, they have the edge to fill such senior management roles.

2.9. Some of the apparent and unnecessary mystery of an actuary's work is directly related to the failure of actuaries to communicate well with non-actuaries. Actuaries generally advise institutions and companies but their work is very relevant to the lives of ordinary people. An actuary's calculations are done in the context of assumptions and the key is to explain the results in this context and convey to the layperson and even some professionals how sensitive the results are to the dynamics of the actuarial basis. The actuary also needs to be able to explain what information the models are conveying, and why the recommendations are as they are, rather than implying that only an actuary could reasonably be expected to understand the configuration of the system and expecting the client, employer or the wider public simply to trust the actuary to have drawn the appropriate conclusions. When actuaries can expand their image from one of providing relevant products and services and ensuring security of funds to that of generating wealth, the image would

improve. Better communication of options and choice would lead to more trust in and respect for the actuary.

3. Appreciation of the Profession

3.1. In his 1996 Presidential Address to the Institute of Actuaries, Ferguson quoted from A.H. Bailey's Presidential Address in 1880: "An actuary must be a mathematician, but a mere mathematician will be a very incompetent actuary". More than a century later many career advisors and students still believe that a talent for mathematics is the sole foundation for becoming a successful actuary. In reality mathematics is only a subset of the required skill set. A focus on technical expertise only does not fulfil the demands of an actuarial career and may even inhibit initiatives in a highly competitive world. Merricks says in his address to the Institute of Actuaries 2001 AGM, " But there is a serious risk that the professional training we offer breeds precisely the wrong qualities needed in managerial and leadership roles, and there is a danger for both professions. Businesses and organisations need advisers who can also be implementers." Success will derive from one's ability to "think outside the box".

3.2. Students need to appreciate related areas impacting on an actuary's work at the beginning of their career. It should not be a surprise to these students to find themselves immersed in the need to read and learn the technical language and rules of other "non-mathematical" subjects and to cope with the writing required in the everyday work as an actuary. They need to see how actuarial work is interwoven with

- the legislative framework,
- economic factors affecting the actuarial models,
- the accounting rules,
- investment availability and strategy,
- data management for administration of the products,
- systems for valuation, experience studies and operations for the financial institutions,
- communication of their findings and the products they design,
- business and management skills,
- appreciation of the needs and interests of different stakeholders and, of course,
- the professional code of conduct and practice standards.

Unfortunately, many students are not exposed to, and therefore cannot appreciate, the entire scope of the profession until they have entered the workforce. This shortcoming exposes the profession to potential deficiencies in some prospective future actuaries.

3.3. Of those students who pursued a university actuarial degree, many become disillusioned with the profession they believed to be a purely technical one, when they come to the realization that much more is required to be a successful actuary.

3.4. We as a profession may also be unwittingly turning away prospective candidates who have an adequate mathematical background, but want to pursue a career that is multi-faceted and not one-dimensional, as the actuarial profession has historically been

viewed. Many of these students opt to pursue an MBA type program – a discipline that will afford them the opportunity to build on their technical strengths and to direct change in the business community. The actuarial profession could perhaps capitalise on people's interest in taking an MBA (and the value which the business world sets on this qualification) by allowing the taking of an MBA to contribute to part of the final process of qualifying as a Fellow. This would also help to create some truly business-oriented actuaries and prepare such people to take positions as Finance Directors or Chief Executives.

3.5. A full appreciation of the profession does not exist in the business community either. Actuaries are still viewed by many as merely "number-crunchers". We are recognized, even applauded, for our technical strengths, but our abilities are viewed by many as narrow in scope.

3.6. The perception that actuaries cannot provide business solutions

- stunts the growth of the profession
- limits the opportunities for actuaries
- hinders actuaries' ability to serve the public interest

3.7. In order to serve the public and to ensure that as a profession we really add value to society, we need to educate the general public and the business community. They in turn will have access to practitioners with specialised skills, who service customers with a high degree of detachment and integrity, who collectively have a particular sense of responsibility and belong to organised bodies with the machinery for testing competence and regulating standards of competence and conduct.

4. Actuarial Theory and Practice

4.1. We advocate drawing attention at an early stage within the initial education program to

- how analytical, mathematical and statistical methods can be used to make commercial decisions about the future; and
- how actuarial models work within the business context.

4.2. Generally, many actuarial solutions are associated with products, benefits or risk management for a target group of people. The actuarial student needs to be aware of the large responsibility the actuary undertakes for the financial well-being of these groups of people affected by their calculations and their professional advice, often for many years into the future.

4.3. With powerful commercial pressures the wider perspective can easily be overlooked, as benefit/product design is oriented towards sales and towards satisfying the employer/client agenda. New ideas may seem worthwhile and interesting in themselves but trainees should be guided to take a step back to assess whether the design is of value to the ultimate beneficiary. When stakeholders feel unfairly treated their usual recourse is the courts.

4.4. The Actuarial Control Cycle, as taught in Australia and likely to form the basis for the development of the generalized core applications stage of the revised Faculty and Institute of Actuaries exams (and possibly the North American ones also) is a fitting way of training actuaries in the broad application of actuarial concepts in a variety of business applications.

4.5. The Actuarial Control Cycle (ACC) subject is Part 2 of a four part program for Australian actuarial education. The ACC takes the fundamental tools covered in Part 1 and demonstrates their application to actuarial work in a range of traditional and non-traditional fields. The ACC model teaches the student how to approach problem solving and how to evaluate and monitor the performance of the solution. The ACC technique is common to all Part 3 specialist practice areas, provides a common grounding for all actuaries and promotes adaptability to non-traditional problems. The ACC model and the topics covered in the subject are described in the Appendix to this paper.

4.6. The proposed Core Applications subject for the new Faculty and Institute of Actuaries examinations is expected to follow a similar approach to the ACC, developing a structure for actuarial thinking based on the following themes:

- understanding the needs of the client or customer
- understanding the internal and external environment
- analysing and measuring risk
- diagnosing the problem
- developing a solution
- carrying through the solution
- understanding and managing uncertainty
- monitoring outcomes
- feed-back to models and assumptions
- communicating ideas and recommendations
- operating within a professional context

4.7. The profession needs to clarify what is uniquely actuarial. Actuarial ideas can serve wider business needs as actuaries expand the application of their techniques, to name a few:

- discounted cash flow
- value based accounting
- data mining
- understanding and managing uncertainty
- financial option pricing
- combining financial models with models of occurrence and severity

- the control cycle
- professionalism

from pensions to insurance to programs associated with housing, transportation, energy, disaster etc. It is desirable that the public should "associate actuaries with a particular way of solving problems" (Thornton, 1999). These activities will lead to an understanding of what the actuary does, the actuarial skill set and the actuarial tool kit.

5. The Workplace

5.1. There is sometimes a tendency in the workplace to relegate actuaries to purely "technical roles". In many firms actuaries work for non-actuaries, who may stipulate what the actuary should or should not do, sometimes with an inadequate appreciation of what the actuary has to offer. Relegating the actuary to a "back room" role is likely to be incompatible with the actuary giving the best advice in the interests of the client.

5.2. The contribution of actuaries is likely to be greatest when their role as the experts in developing business solutions is recognised and they are allowed to be at the centre of the operation with a finger constantly on the pulse. For the sake of convenience we use such terms as administration, systems, legal, accounting, etc. to classify parts of the operation but more often than not boundaries disappear and actuaries can play a vital role in masterminding projects.

5.3. Transfer of knowledge between each generation vertically and between actuaries and non-actuaries horizontally is important for the smooth set-up and running of a business operation. It is very costly for trainees and others to learn by a trial and error approach, so the more experienced have a duty to give appropriate direction in everyday work. A more formal approach to mentoring students could play an important part also in the personal professional development of actuarial trainees and might form part of a structured work experience requirement.

5.4. It is a common business practice to delegate work to junior staff to reduce operating costs. It is important that senior staff control the process and calculations in order to ensure that there is no loss of quality in the outputs. The trainee who is taught to appreciate how each person's work contributes to the end result and to recognise the interlocking nature of the different contributions will be better equipped to engineer and manage projects in the future.

5.5. Trainees need to learn to appreciate that a good design is of little use if the cost of administering that design is prohibitive. It is true that the commercial forces can eventually cause such an operation to collapse but the losses sustained both to shareholders and beneficiaries could be significant.

5.6. There is an increasing emphasis on revenue growth to the exclusion of other important aspects of actuarial work. This is not to say profit is unimportant but it is possible to honour sound business practices and moral commitments and still make a profit. It is now fashionable for actuaries to meet "aggressive" targets, an undertaking which is counter to the objective of giving high quality advice and weakens the value

of the actuary's role. This is "an unforgiving competitive commercial world" (Ferguson, 1997) and it is worthwhile for students to have some discussion and debate about managing the apparent conflict between being client focussed and ensuring the public good is always uppermost. On the other hand, the fear of litigation should not "result in practices which are cautious to the point that they diminish the quality of the advice that is given" (Ferguson, 1997).

5.7. New graduates are trying to make their way in a highly competitive, commercial world. The values of serving the public interest, broadening the profession and marketing the profession (Faculty and Institute of Actuaries, 2000) hinge on them realising that success and sustainable revenue generation are essentially dependent on

- demonstrating actuarial expertise and talent,
- having a broad skill set, reaching beyond our present actuarial training,
- gaining the respect, trust, admiration of those outside the profession,
- serving the public interest and
- fulfilling obligations to the stakeholders.

In the past the ordered workplace environment was conducive to showing these links to the trainees. Now that companies have grown rapidly in size, competition is more severe, when pay is tied to performance, the business framework has become international and the environment more fluid, it may only be by chance that many members of the profession acquire these skills on the job. Therefore, if these links were made a formal requirement in the training program, there would be a higher probability of success. Education in professionalism should have an important place both in the formal education program of trainee actuaries and in the requirements for work experience to acquire an actuarial designation.

5.8. The message "serving the public" is heard too infrequently, probably only in the introduction to the code of conduct and in Presidential Addresses. Meeting sales and billing targets should certainly not be allowed to crowd out professional ethics and compliance with standards. When bonus targets become the dominant theme and compliance and ethics become an afterthought in the commercial world, "serving the public" fades into the background. However, the significance and ready acceptance of comments such as "……socially responsible business is good business." (The Actuary August 2000, page 24.) and "People matter more than numbers" (The Actuary Jan./Feb. 2001, page 43) show how cogent and relevant they are to our thinking.

5.9. It is said that actuaries have a conflict of interest since employers hire them and pay their fees, so they cannot be impartial. The profession should take heed of such statements and take counter-action. Young trainees hear the message in the workplace that the client comes first and it is the client who supports us and believe such statements to be the whole story. The workplace training does not insist that the actuary also has a duty to fulfil member expectations and therefore the actuary's work should be objective and always have in mind the impact of advice on third parties.

6. Training to make the next generation stronger

6.1. The actuary has to be a recognised expert in relevant legislation. This fact is a solid foundation on which to build a reputation. However, the membership could become complacent fulfilling routine regulatory functions, following highly prescriptive standards of practice. Some may be attracted to this type of work but it will not be good for the profession in the long term, as it will blunt the cutting edge of professional judgement. There is also a great demand for actuaries in more expansive professional roles. We are moving to a position where the initial education contains relatively little country-specific regulatory material, not least because the major examining bodies are seeking to make their examinations accessible to students around the globe. This will put a greater onus on Continuing Professional Development to ensure that practising actuaries have current and comprehensive knowledge of local legislation and regulations.

6.2. The long term nature of an actuary's work, together with the business skills of managing change and innovation, equip the actuary with the ability to adapt to the diverse demands in a wider range of businesses. Consequently, their visibility will increase. We should note that, as the number of financial institutions is reducing through mergers, some of the traditional core businesses might not offer actuaries the same opportunities in the future as in the past. This will force future generations of actuaries to adjust to related or non-traditional areas of work.

6.3. Those who choose to become actuaries are self-selected, so the challenge is to attract individuals who will excel and fulfil the vision and values of the profession. The future leaders, with expertise, imagination and personality, will emerge from this body.

6.4. By the Fellowship stage the actuary should be seen as the financial engineer equipped to design the operation and to understand all the dynamics of the system, by comparison with specialists for separate parts of the system, who will not necessarily be as well integrated. The actuary will be critical to the organisation by having the judgement to optimise the use of resources.

6.5. The profession would like to attract individuals who are adaptable to change, think critically, access and apply specialized knowledge from other disciplines to solve problems, apply professional judgement and make recommendations within the legislative, accounting and actuarial context. We see this as the talent needed for the profession to prosper. The rigorous training program that exists should be slanted in this direction to achieve this goal.

6.6. We suggest that the training be designed to foster the student's natural curiosity and fascination with actuarial problems rather than performing repetitive processes for regulatory filings. This leads on to another level of training such as mentoring which offers the opportunity to practising actuaries to fulfil their responsibility towards the next generation by encouraging and coaching students and newly qualified actuaries.

7. How could the training process evolve?

7.1. Apart from having an introduction to business skills at the start of the initial education program, it could be valuable to introduce nearer to the end of the program an actuarial course which emphasizes both the business context of actuarial work and also some of the business skills which are typically taught in MBA programs. This could include strategic planning, budgeting, and management models. It would

- formalise in the education program explicit training in business skills which would aim to make the actuary more visible and more readily acceptable to colleagues of other professions, boards of directors, and other clients; and
- teach student actuaries through case studies which pull together knowledge acquired in the earlier sections of the program.

7.2. The ability of actuaries to provide solutions to business problems will be critical to improving our visibility and marketability. The joint Faculty and Institute (UK) Education Strategy for 2005 proposes teaching the business content at the Fellowship stage by a variety of non-examined modules dealing with practical topics.

7.3. It would also be useful to introduce a module on database management, systems and programming. Not all actuaries work in large organizations with specialist departments, or in countries that have this infrastructure. The actuary may have a critical role in the decision to select or design an administration system for an organisation. This grounding will give the actuary some background to recommend an appropriate system that is relevant and cost effective. The actuary should be aware of the implications of the benefit design on the cost of operations.

7.4. With the universities undertaking more of the earlier training, it would be relatively straightforward for them to offer a module in law, so that the student gets some appreciation of the general legal context surrounding an actuary's work. This is already part of the actuarial education in a number of continental European countries. It may not be viable to design a suitable course only for actuarial students but they could be given credit for taking law courses covering such topics as corporate law, contracts, liability, tax, employment standards in business and industrial relations programs. Students qualifying by a non-university route should also be given the opportunity to take such courses, not necessarily with formal unseen examinations.

7.5. Unfortunately the professions are experiencing an increase in the incidence of litigation. This has not yet hit the actuarial profession as much as some other professions, but the trend is likely to be towards more lawsuits. Alongside other aspects of professionalism preparation, there could be much earlier reference to some of the causes of litigation, which the professionalism course reinforces at the end of the program. This is another challenge for actuaries, to try to make designs more equitable for the different stakeholders, in an effort to contain the causes of litigation and, if there are inequities, to assist the courts in restoring equity. Litigation increases visibility but the ground lost following litigation will need far more effort to restore trust and respect.

7.6. The current training content for some territories relies heavily on business and communication skills to be developed in an informal manner through work experience. Since there are warning signs that it is difficult to sustain the apprenticeship model (Paul McNamara: The Actuary Jan./Feb. 2001, page 43), such content could be included in the formal training, especially as more actuarial qualification is covered in university courses. Again there may be opportunities to use a more flexible approach to the transition from Associateship to Fellowship to ensure that these skills are developed before the actuary becomes fully qualified and can take on major commercial and public interest roles.

7.7. The move to establish a universal basic common core will be good in promoting a single image of actuarial training that is not fragmented by regional differences in training. This concentrates on understanding the fundamental principles. When it is the time to study the country-specific rules the course could take the trainee one step further to analyse the reasoning behind the rules, such as those associated with regulation, tax, accounting etc., and whether they are effective at fulfilling the objectives. This is to give the trainee the ability to see that they do not just accept rules but have a role to play in designing and interpreting them.

7.8. There is so much to cover in the training that it is important to remove any overlap in courses. We would be prepared to see some reduction in the purely technical content of the training in order to make room for the greater business orientation we are proposing. After all it does not seem essential to cover every possible actuarial skill in the initial education when the emphasis nowadays is on the need for lifelong learning.

8. Preparing for the future

8.1. There are significant changes occurring in the environment: social, economic, political and technological and they all impinge on an actuary's work. The trainee needs to realise that not only should the actuary have the skills to control operations today but the actuary should also have the vision and entrepreneurial skills to anticipate and provide for social needs as they evolve, given the changes that are taking place.

8.2. The forces driving the change in the environment are the globalisation of businesses, the advances in technology, the increase of entrepreneurial spirit, the cultural diversity of the populations, and the social expectations for instant service. This is a lot to absorb and collate but it is natural to want the new program designed for 2005 to have the actuarial training and the thinking processes instilled in the trainee to make the actuary the ideal choice as a future leader.

8.3. As business becomes more global, with individual corporations, industries and even the entire economy showing a global trend, the rules distinguishing operations by country may become less distinct and less important. Consequently, the actuary's work moves from the local to the international on several fronts, e.g.legal, accounting, systems, etc. and the ability to cope in this expanding environment requires flexibility and a strong educational base.

8.4. The actuary has a larger role to play in establishing a sound public policy on difficult problems facing governments. These can range from retirement security, health care provision and long term care to housing, transportation, energy and food supply. There are demographic shifts, changes in fertility patterns, lifestyles etc. to take into account. The actuary should be well placed to shoulder this responsibility.

8.5. People have increased job mobility and will most likely have more mobility in the future. Actuaries have traditionally worked in the area of retirement and health care benefits. Now business skills in human resource management can assist the actuary to understand the context of the full benefit program needed for this mobile and cultural diverse population which is changing faster than in previous years. The benefits are a subsidiary factor affecting recruitment and retention policies for employers.

8.6. "….Interactive television and virtual advice hold the prospect of revolutionising the delivery of advice-based products" (see The Actuary Jan./Feb. 2001, page 43). This is another challenge to meet in the not too distant future. The products and the modelling tools that the actuary develops will have to fulfil the needs of the consumer while taking advantage of the flexibility offered by new technology.

9. Concluding Remarks

9.1. It is the continued strength and growth of the financial institutions built by actuaries and advised by them that will be the best manifestation of their work. Managing and meeting the expectations of both shareholders and customers is a constant challenge but exceeding those expectations could be the ultimate goal for success.

9.2. Actuaries need to be trained in ways which will attract those with the skills and aptitudes to aspire to senior management positions, as well as having the mathematical and financial skills to perform more technical actuarial roles. The training should also have sufficient breadth and generality to prepare future actuaries for a much wider range of roles than in the past. Whilst we cannot afford to lose sight of the mathematical and technical foundation of our profession, it is essential to train actuaries with broader business skills and to focus recruitment on the brightest and best of the next generation, offering them an attractive and challenging career opportunity.

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APPENDIX

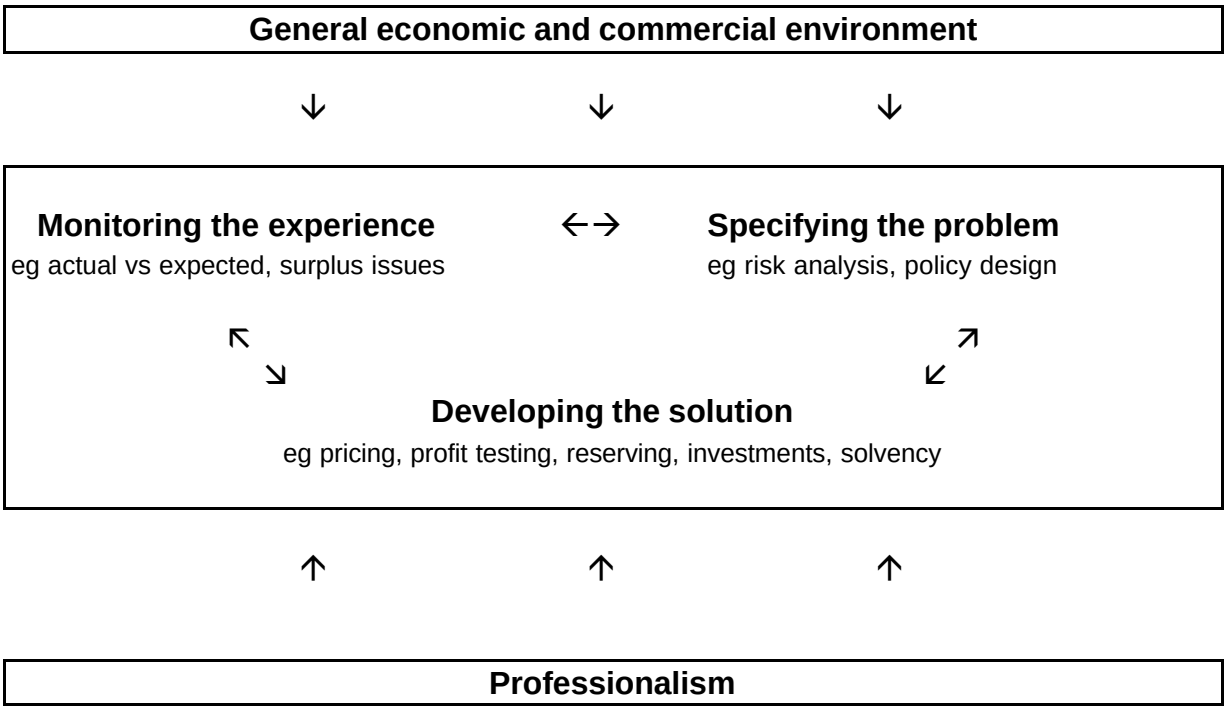
Extract from The Actuarial Control Cycle: An Outline
Shepherd and Bellis

3. THE ACTUARIAL CONTROL CYCLE : THE PARADIGM

The ACC is a model of actuarial work. Like all models, it does not necessarily always accurately fit the phenomenon it portrays at all times or in all circumstances. However, like all good models, it is simple, and it does help the user to a clearer understanding of the phenomenon being modelled.

The ACC is often represented diagrammatically, as in Figure 2. The central part of the model is based on a simple approach to problem solving - firstly, define the problem, then design and implement a solution, then monitor the effectiveness of the solution and revise it if necessary. The impact of the context (eg legislation, taxation, economic trends) is emphasised by the reference to the economic and commercial environment. The requirements of professionalism are recognised at all stages of the cycle.

Figure 2 : THE ACTUARIAL CONTROL CYCLE



3.2 ACC applies at various levels

The ACC can be applied at the level of a particular insurance or other financial product, charting its lifetime from recognition of a need to be met, through product design, financing, profit testing, pricing and distribution, into reserving,

investment, solvency and capital adequacy implications, and on to monitoring of expected versus actual experience, ongoing control of risk through revision of premiums or charges or benefits or other means, until the final decision to retire or replace the product.

The Cycle can also apply at the level of the total business of a fund or division or company or plan. Its periodicity can be daily or even less, yearly or even longer.

3.3 Nature of the ACC

The ACC is "actuarial" because, although the underlying problem solving model is completely general, the ACC embodies the basic elements common to all actuarial work :

- uncertain future events whose financial impact must be estimated
- a long-term rather than short-term horizon
- stakeholders' requirements and risk profiles to be recognised
- decisions to be made now in the light of likely future outcomes
- the use of models to represent future financial outcomes
- incorporating assumptions based on similar historical experience
- allowing for the impact of legislation, regulation, taxation, competition, etc
- interpreting the results of modelling to develop practical strategies
- monitoring and periodically analysing emerging experience
- modifying models/strategies in the light of analysis of emerging experience

The ACC is a "control" cycle both because actuarial involvement usually includes all phases of the cycle, and because objectives or strategies or plans or standards are established, against which subsequent performance must be measured, with earlier decisions revised where appropriate.

The term "cycle", and the use of bi-directional arrows in the diagram of Figure 2, highlight the importance of monitoring and feedback, and the inter-relationships between elements of the cycle. In actuarial work, the feedback mechanism within the cycle is not one which results in pre-determined, unconscious, automatic adjustment, as may happen in some engineering systems. The ACC's feedback mechanism involves the actuary in exercising personal, professional judgement.

4. CONCLUSION

The Actuarial Control Cycle is central to Australian actuarial education. It embraces the knowledge, skills and attitudes considered essential for all actuaries. It provides the flexibility that the educational program needs to adapt to a rapidly changing world. It enhances the capacity of individual future actuaries to recognise opportunities for applying their skills and equips them to market those skills to employers and clients. It strengthens the foundations on which the profession will continue to expand as a flexible, outward-looking and united body.

Outline of Topics

Topic 1 : Overview of the Actuarial Control Cycle

General aim

This topic explains the Actuarial Control Cycle (ACC) both as a key component of actuarial education, and as a generalised model of actuarial work. It examines, in broad terms, how the ACC represents the approach and function of an actuary in a range of actuarial practice areas.

Learning objectives

After completing Topic 1 you should be able to :

* Explain the ACC as a general model of actuarial work.

* Explain each component of the ACC and its significance.

* Appreciate the importance of the context within which actuarial work takes place.

* Begin to understand the implications of professionalism for the work of an actuary.

* Explain the inter-relationships between components of the ACC.

* Recognise the ACC in aspects of your own current or prior work.

* Recognise the ACC in examples of actuarial work outlined in the readings.

Topic 2 : The context of actuarial work

General aim

This topic examines the environment (context) in which actuarial work takes place, to identify those components which may impact on the actuary's work, and to discuss their importance. Specific components considered include regulation, legislation, taxation, government policy, economic conditions and trends, demographic and social changes, professionalism.

Learning objectives

After completing Topic 2 you should be able to :

* Identify the components of the environment which are likely to affect the work of an actuary in a particular field (emerging as well as traditional).

* Discuss the way in which a particular environmental component may impact on various types of actuarial work.

* Assess (in broad terms) the relative importance of the various environmental components affecting each type of actuarial work.

Topic 3 : Financial products & services - the risks involved

General aim

This topic examines the general features of financial products and services from the perspectives of both consumers and providers, with particular reference to the risks involved for both parties.

Learning objectives

After completing Topic 3 you should be able to :

* Outline the needs of individual and business consumers which financial products and services may be able to meet.

* Recognise the major considerations that providers of financial products and services must allow for in meeting those needs.

* Be familiar with the principal terms commonly used in life insurance, general insurance and superannuation.

* Describe the main features of the insurance markets, the common classes of life and general insurance business, and the principal financial products and services offered by other financial institutions.

* Identify the financial, business and political risks associated with a financial product or service for both consumer and provider.

* Describe the major forms of superannuation available and their respective advantages and disadvantages.

* Discuss the effect of alternative marketing strategies on the quality and quantity of business generated.

Topic 4 : Assessment of Commercial Risks

General aim

This topic looks at the risks inherent in any business venture and identifies methods for the control or removal of those risks.

Learning objectives

After completing Topic 4 you should be able to :

* Identify the risks likely to be encountered in a commercial venture

* Explain the implications of those risks

* Estimate the relative importance of each of the risks

* Recommend appropriate management tools for each identified risk

Topic 5 : Financial products & services - the risks involved

General aim

This topic looks at the design process for financial products.

Learning objectives

After completing Topic 5 you should, in the context of the design of financial products, be able to :

* Outline the factors to consider in the design

* Explain the purpose and process of risk assessment, and the underwriting process.

* Understand the impact of adverse selection on a financial services provider.

* Outline the operation of the main types of reinsurance.

Topic 6 : Modelling: its role in actuarial work

General aim

This topic examines the use of models in actuarial work: why models are used, the basic characteristics of models, the advantages and disadvantages of using models, how models can support financial decision making, and the process of developing and maintaining a model.

Learning objectives

After completing Topic 6 you should be able to :
* Discuss the objectives of and requirements for building a model for the management of risk-based and other insurance products.
* Describe the requirements of a model from the perspective of the ultimate users.
* Describe the basic features of a model required to project the experience of a portfolio of financial contracts.
* Discuss the advantages and disadvantages of stochastic and deterministic models.
* Identify the assumptions required for a particular model.
* Discuss estimation of a model's parameters.

* Discuss the choice of parameters for a model and the interrelationships between the parameters within the model.
* Describe the process of, and discuss the importance of, sensitivity testing of models.

Topic 7 : Pricing financial products/services

General aim

This topic examines the pricing of financial products and services, with particular focus on pricing philosophy, choice of assumptions in pricing and on-going financial management over the lifetime of the product.

Learning objectives

After completing Topic 7 you should be able to :
* Discuss the general objectives of pricing, especially statutory certification, pricing strategy and factors influencing pricing.
* Identify the assumptions necessary for pricing a particular product, specify the information required for choosing each assumption, and discuss possible problems in obtaining the information.
* Discuss the use of margins (explicit or implicit) in pricing assumptions.
* Explain the role of profit testing in pricing and its relationship with the desired return on capital.
* Explain the concept of sound rating as it is understood in general insurance, and discuss the practical considerations which may also influence the final choice of premium rates.
* Explain the economic and demographic factors that can affect the cost of providing superannuation benefits, and discuss how assumptions may be chosen for the future values of these factors.
* Discuss the implications of different distribution methods for pricing.
* Discuss the application of pricing approaches and methods in non-traditional areas.

Topic 8 : Reserving for financial products

General aim

This topic looks at the needs for estimating the value of the assets and liabilities of financial institutions

Learning objectives

After completing Topic 8 you should:

* Understand and be able to explain the need for reserves

* Understand and be able to explain the different purposes of carrying out a valuation of a financial institution

* Understand the implication and importance of valuation assumptions

* Be aware of the dangers of unreliable and missing data

* Be familiar with the major methods for valuing both and general companies

* Be familiar with the major methods of valuing superannuation funds

Topic 9 : Investments - background

General aim

This topic considers the various investment alternatives that are available in the capital markets for investing the assets built up by financial institutions. You will also learn some of the theories about how investment markets operate.

Learning objectives

After completing Topic 9 you should be able to:

a. Understand and be able to explain the features of the following financial instruments, together with their historical risk characteristics:

- money market instruments
- Government and corporate debt
- Australian equities
- overseas equities and fixed interest
- direct property and property trusts
- futures, swaps and options

b. Understand the major economic influences affecting the behaviour of the financial markets

c. Outline, in very broad terms (and not specific to a particular tax regime), the implications of the taxation treatment of different forms of investments for an institutional investor

d. Understand and be able to apply the main methods used to value the common forms of debt, equity and derivative securities

e. Understand the major theories in the capital markets including efficient market hypothesis, the capital asset pricing model and the arbitrage pricing theory, and be able to discuss the practical issues surrounding the theory

Topic 10 : Investment - process

General aim

This topic considers how the investment process can implemented by financial institutions, in view of their differing liabilities.

Learning objectives

After completing Topic 10 you should be able to:

a. Describe the portfolio management process for institutional investors (including life insurance, general insurance, health insurance and superannuation funds) including planning the investment strategy, implementing the strategy and monitoring the performance of the strategy
b. Understand the factors, including the role of liabilities, the attitude to risk, liquidity requirements and any gearing restrictions to be taken into account in establishing an investment strategy
c. Understand the asset-liability matching requirements of insurers and superannuation funds and explain how projection models with and without stochastic features can be used to determine the appropriate asset-liability management strategy
d. Outline and discuss methods of implementing the investment strategy including manager selection and the role and importance of strategic and tactical asset allocation for institutional funds
e. Understand the considerations that should be taken into account in the valuation of assets and how this should be related to the valuation of liabilities and any additional reserves
f. Understand and be able to apply the main methods used to monitor returns on asset portfolios including different methods of calculating returns, performance attribution to asset class and security selection, and allowing for risk

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Topic 11 : Solvency

General aim

This topic considers alternative definitions of solvency and how to assess future levels of solvency.

Learning objectives

After completing Topic 11 you should be able to:

a. Understand the reasons for measuring solvency
b. Understand and be able to discuss the alternative measures of solvency for life insurance business, general insurance business and a superannuation fund including the valuation of assets
c. Discuss how to project future levels of solvency in each area and how to respond to these results
d. Describe the differences between a best estimate valuation of life policy liabilities and a valuation for solvency/capital adequacy purposes
e. Understand and be able to explain the ongoing need for capital and, where appropriate, the nature and role of the estate
f. Understand the objectives of the regulators in setting minimum solvency standards

g. Outline the effects of any accounting standards on the measures of solvency

Topic 12 : Monitoring Experience

General aim

This topic considers how the actual experience should be monitored and assessed.

Learning objectives

After completing Topic 12 you should be able to:

a. Understand the reasons for monitoring experience and how these results link into the control cycle
b. Identify the data required to monitor the experience of a life insurance company, a general insurance company and a superannuation fund
c. Be able to discuss the concept of expense analysis and how it can be carried out in a range of circumstances
d. Be able to analyse the experience of a life insurer with reference to claims experience and investment performance
e. Analyse the experience of a general insurer with reference to claim and exposure analysis, portfolio analysis and movement analysis
f. Analyse the experience of a defined benefit superannuation fund for valuation and other purposes with reference to investment returns, salary movements and decrements
g. Discuss how the analysis of this experience may cause changes in the previous assumptions, the model used, the risks accepted or other aspects of the business

Topic 13 : Sources and Distribution of Profit

General aim

This topic considers the sources of profit, the factors that affect the distribution of this profit, and the methods that are used in practice in distributing profit to participating contracts.

Learning objectives

After completing Topic 13 you should be able to:

a. Explain the link between profit and other items in the actuarial control cycle
b. Describe the main sources of profit for an insurer and superannuation fund, and explain how this analysis can be used to check the accuracy and completeness of valuation data
c. Describe appropriate ways of allocating profit for an insurer and achieving equity between different groups of policyholders and shareholders
d. Discuss the methods available to handle surpluses and deficits within a superannuation plan, including the issue of equity

Topic 14 : Professionalism

General aim

This topic considers how the concept of professionalism influences the way that actuaries carry out their work.

Learning objectives

After completing Topic 14 you should be able to:

a. Outline the main features of the IAA's code of conduct
b. Understand the main features of the IAA's professional standards and the major Guidance Notes
c. Discuss situations where actuarial expertise may be insufficient
d. Discuss the roles of the Appointed Actuary and the Senior Actuary

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Topic 15 : Applying the actuarial control cycle approach to a wide range of problems

General aim

The students reflect on the applicability of the actuarial control cycle approach.

Learning objectives

After completing the whole course, you should be able to:

a. Understand how the actuarial control cycle approach and actuarial techniques can be used to tackle many commercial problems
b. Illustrate your understanding of the principles by applying them to situations from both traditional and non-traditional areas of actuarial work, for the total cycle or for any section of it.