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THE ROLE OF THE ACTUARY IN THE SUPERVISION OF
INSURANCE

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1. Introduction

The role of the actuary in insurance developed over several centuries. An important early landmark was the publication in 1691 by Johann de Wit, Prime Minister of the Netherlands, of a treatise on the mathematics of an annuity, including an early attempt at an empirically based mortality table. Edmund Halley, the English astronomer better known for the comet named after him, published similar ideas, probably independently developed, in a paper to the Royal Society of London in 1693.

Life insurance at that time was written on a short-term basis, in a similar way to marine and fire insurance business. The mathematician James Dodson, incensed by difficulties in obtaining life insurance cover as he got older, devised the concept of long-term insurance for a level annual premium, and helped to establish in 1762 the Equitable Life Assurance Society, which operated on this new scientific life insurance principle. The Secretary to the Board of the Equitable was given the title “Actuary”, based on the Latin *actuarius*, who was the business manager of the Senate in ancient Rome, and kept the daily verbatim record there. In 1775, William Morgan FRS was appointed as the Actuary of the Equitable. Since he was himself an excellent mathematician, he took over the role of premium calculation and financial manager and became the first actuary in the sense we know it today.

By the early 19th century, a number of life insurance companies in the United Kingdom had created a post of “actuary”. New legislation on friendly societies in 1819 required each society to appoint an actuary to review its financial condition. By the middle of the 19th century, different groups of actuaries had begun to meet informally in both Edinburgh and London. One of these groupings became the Association of Scottish Life Offices and another became the Actuaries Club. However, each of these was a rather exclusive group, and a movement began to establish a more open professional organisation, which would be dedicated to education, research, development of the role of actuary and maintaining high standards of practise. This led to the formation of the Institute of Actuaries in London in 1848, followed by the Faculty of Actuaries in Scotland in 1856. These organisations rapidly established credibility, so that the first insurance law in the United Kingdom, the Life Assurance Act 1870, placed considerable emphasis on the role of the actuary in carrying out periodic valuations of assets and liabilities (initially only every 10 years!) and publishing the results of such valuations.

Over the next 50 years, actuarial associations were established in several other European countries, in the United States, Australia and Japan. In 1895, the first International Congress of Actuaries was held in Brussels, and the International Actuarial Association (IAA) was formed.

2. The role of the profession

A professional body can be distinguished by its role in setting ethical standards of behaviour, through a code of conduct and standards of practise. For many years bodies such as the Institute of Actuaries and the Faculty of Actuaries operated with unwritten but well-understood codes of behaviour. Nowadays codes of conduct are generally expected to be formal written documents, and many actuarial associations have also developed more detailed standards of practise, or guidance notes, in particular practise areas.

In September 1995, the IAA formed a special section for professional actuarial associations, known as the International Forum of Actuarial Associations (IFAA). The first requirement to be met, in order to be accredited as a Full Member of the IFAA, was to have in place a code of conduct at least equivalent to the common minimum code of conduct adopted several years ago by the actuarial associations in the countries of the European Union (the “Groupe Consultatif”). In June 1998, the IAA itself underwent major constitutional change to become an association of associations, in effect taking on all the characteristics and structures of the IFAA, which was absorbed into the IAA.

The IAA now requires Full Member Associations to have a code of conduct and to have a disciplinary process in place, in order to be able to ensure compliance with the code and with any relevant standards of practise. Member associations must also have a proper due process for consultation with their individual members (and other relevant persons) before adopting any new standard of practise.

The IAA has set itself a mission “to encourage the development of a global profession, acknowledged as technically competent and professionally reliable, which will ensure that the public interest is served”.

Apart from conduct issues, professional associations of actuaries take ownership of standards of qualification, whether or not they are directly responsible for providing education or setting examinations. They are also responsible for the continuing professional development of their members.

3. The skills of actuaries

The actuarial profession is not well-known in all countries. Indeed, in some countries the profession is very small. However, it can be expected that numbers will grow substantially in future. All countries with financial institutions, such as insurance companies and pension funds, require actuaries and an actuarial profession.

Actuaries are experts in the evaluation and management of financial risk. A concise statement used by the Faculty and Institute of Actuaries in the U.K. is that “actuaries make financial sense of the future”.

At a more detailed level, actuaries are concerned with a whole range of problems in insurance companies. They are experts in data management and analysis, techniques of rating or setting premiums, establishing technical provisions, designing reinsurance programmes, pricing reinsurance, evaluating capital needs and the overall financial management of a company (assets and liabilities). Actuaries have formal training in mathematics, statistics, economics, investment, finance, modelling techniques, as well as in practical aspects of the insurance business, such as product design, regulatory and fiscal requirements, and accounting practises. In addition, actuaries in most countries are members of a professional body and subject to professional codes of conduct and relevant standards of practise.

4. The role of the actuary in the financial management and control of life insurance companies

It is universally acknowledged that the life insurance business depends fundamentally on actuarial skills. However, different regulatory traditions ascribe different levels of professional responsibility to the actuary.

At one end of the regulatory spectrum is the substantive (or material) control approach, whereby products have to be approved by the supervisor (often including the detailed policy wording), as do the actual premium rates to be charged, including, in the case of life insurance, technical assumptions. In a number of countries which operated this type of control, the technical basis for reserving was also approved at the authorisation stage (in fact, the reserving basis was usually the same as the premium basis), as was the approach, and even the formulae, for distributing profits to policyholders. In these circumstances the role of the company actuary was focused mostly on carrying out the calculations in accordance with the agreed methods and assumptions. Proposals for new policies had to be developed, but the scope for individual actuarial judgement was limited, since the key judgements on adequacy and viability were taken by the regulatory authority. This placed particularly onerous responsibilities on actuaries within the supervisory body.

Rather more discretion is given to insurance companies, and hence more professional responsibility to their actuaries, under a régime of systematic notification. Here, new products and premium rates have to be notified to the supervisor, but formal approval is not required. The supervisor usually has the right to object or to intervene, perhaps within a specified time period, but the expectation is that this will be the exception rather than the rule.

Under some systematic notification régimes there is also the expectation that the technical bases underlying premium rates will be adopted also in subsequent years for setting technical provisions. This may not be an unreasonable assumption with certain kinds of business, in particular regular premium participating whole life and endowment business, where the assets are valued using a passive method, such as historic cost, or written-down historic cost. The whole approach to premium-setting and valuation is then a passive one, designed to allow surplus to emerge gradually for allocation to policyholders in the form of bonus.

However, given the increasing moves towards market valuation of assets, and the development, in most environments, of a wide variety of products, including non-participating contracts, it is now more generally recognised that reserving bases cannot be constrained to follow the premium basis. Indeed, there is an essential difference in philosophy between pricing and reserving. Pricing is driven by commercial considerations, and represents a balance between the conflicting demands of remaining competitive in the insurance marketplace and charging sufficient sums to offer a reasonable prospect of profitability. Reserving, on the other hand, is carried out in the context of regulatory concerns for solvency and financial strength. A prudent approach is necessary for reserving purposes, in order that the supervisor can be satisfied that the assets backing the technical reserves are likely in most circumstances to be adequate to meet the full cost of the liabilities involved in satisfying the contracts which the company has written.

One approach to the regulation of technical provisions, whether or not premium rates are required to be notified to the supervisor (or approved by the supervisor), is for the minimum technical basis standard to be laid down in the law (primary or, more likely, secondary legislation) or specified by the supervisor. However, it is increasingly difficult to specify all aspects of a minimum reserving basis for all types of products in a way that will be appropriate in all conditions. It is sensible, therefore, to place professional responsibility on the company actuary for establishing prudent technical provisions.

In some countries the actuary has specific professional responsibility for determining liabilities, perhaps even providing certification of their value, or a report for the supervisor, which may be subject to wider disclosure. In such cases the value of the assets may be determined according to regulations or supervisory rules, and does not necessarily fall within the purview of the actuary. However, it is now more generally recognised that the liabilities and the assets cannot sensibly be considered in isolation from each other. The assets backing the technical provisions are specifically held to meet future liabilities in respect of the existing business.

Ideally one could imagine a company arranging its affairs so that the assets it holds can be expected to generate cash income flows which will exactly match the cash flows expected to be needed to meet the liabilities. In that hypothetical situation, it would be anomalous if the methods of valuing the liabilities and the assets gave rise to an apparent surplus or deficit. This is a particular case of a general principle, that what is of concern is not the value of the assets or the value of the liabilities as such, but the adequacy of the assets to meet the liabilities. This is what the actuary should be asked to certify. It is not many years since the form of actuarial certification required for life insurance companies in the United States (applied in all jurisdictions through forms stipulated by the National Association of Insurance Commissioners) was changed from a certificate of the amount of liabilities to a certificate of the adequacy of assets to meet the liabilities.

Within the life insurance company itself, actuaries normally would be closely involved in the development of products, advising on policy terms and conditions, setting premium rates, advising on the distribution of profits to policyholders and shareholders, designing suitable reinsurance programmes, advising on appropriate investment policy, monitoring overall financial condition and reporting to the Board on future financial condition.

5. The appointed actuary

A more comprehensive formal involvement of the actuary in the financial monitoring and control of the insurance business began to be achieved in the United Kingdom through the introduction in 1974 of the Appointed Actuary concept, which was first enacted in the Insurance Companies Act 1973. Although the term “appointed actuary” has entered the vocabulary and is widely employed, the legislation did not in fact use this terminology, stating simply that every insurance company transacting long-term insurance business should “appoint an actuary”, who must, as prescribed in subsequent regulations, be a Fellow of the Institute of Actuaries or a Fellow of the Faculty of Actuaries and over the age of 30.

An important distinguishing feature of this approach from what had gone on before was the continuous nature of the appointment. The Appointed Actuary is not just required to carry out specific tasks, such as the periodical valuation of liabilities and the determination of surplus, but must be identified as a named individual at all times. The legislation (primary and secondary) required the Appointed Actuary to carry out an annual valuation of the liabilities of the long-term insurance business and to determine the surplus in the long-term business fund available for distribution (or, as the case may be, the deficit, which must be made good before any upstream holding company of the insurance company may pay a dividend to its shareholders). The Appointed Actuary must now provide an annual certificate detailing the amount of the required minimum solvency margin and certifying that the amount published as reserves in respect of the liabilities of the long-term business constitutes proper provision for those liabilities. The Appointed Actuary must also certify each year that the data are adequate to support the valuation and that the premiums charged have been adequate in relation to the corresponding liabilities being taken on, having regard to the overall financial position of the company.

A remarkable aspect of the U.K. Appointed Actuary system is the extent to which the responsibilities are spelt out in professional guidance, rather than in legislation or direct requirements of the insurance supervisory authority (for some years this was the Insurance Division of the Department of Trade and Industry, before responsibility was transferred to HM Treasury, and then, in January 1999, contracted out to the Financial Services Authority, or FSA). Following extensive discussions, the Institute of Actuaries and the Faculty of Actuaries jointly issued a guidance note in May 1975, subsequently known as GN1, which set out in more detail what was expected of the Appointed Actuary. This included a requirement to have direct access to the Board of Directors of the company, to report to the directors on the results of the annual valuation of assets and liabilities, and to ensure that the directors receive a report containing the actuary’s recommendations on the distribution of surplus before making any decisions on the declaration of bonuses to policyholders or dividends to shareholders.

Following the introduction of a minimum statutory valuation basis for the determination of liabilities, the profession issued a further guidance note, GN8, amplifying the meaning of the regulations. This guidance note has been updated on a regular basis to reflect changes in the regulations, most notably to incorporate a formal resilience test and to comply with the changes induced by the Third Life Directive. More recently, a requirement to report annually to the Board on issues of Policyholder Reasonable Expectations (PRE) has been introduced into GN1.

Two other key professional requirements define the distinctive Appointed Actuary role. One is that the Appointed Actuary must be satisfied at all times that, if he or she were to carry out a full actuarial valuation, the financial position would be satisfactory. This represents a fundamental shift of responsibility for monitoring financial strength from the supervisor to the Appointed Actuary. It implicitly acknowledges that there is little that the supervisor can do to keep track of developments between reporting dates. The formal published valuation takes place only annually, is submitted to the supervisor six months after the date to which it relates, and may not be analysed in detail until some weeks (or even months) after that. The Appointed Actuary, on the other hand, is deemed to be in such a key position within the company that he or she should have a good idea of what the position is at any particular moment, and not just at year-ends. In order to be satisfied on this, the Appointed Actuary has to monitor in detail all aspects which could impinge upon the company's financial position, in particular:

- product design
- methods of marketing
- volumes of business
- premium rates
- options and guarantees
- surrender values and paid-up values
- investments held and changes in investment policy
- derivative exposures
- current and likely future level of expenses
- current and likely future tax basis
- reinsurance arrangements
- claims handling policy
- any contingent liabilities.

The Appointed Actuary needs to be able to model the financial behaviour of the company between valuations, so as to be able to estimate the effects of these various factors on the overall financial condition and, in particular, on the company's ability to meet (and continue to meet) the minimum solvency margin requirement.

The Appointed Actuary is clearly expected to act as a front-line controller of prudential financial management, lessening the need for close regulatory attention, which could never in practise give the same degree of continuous monitoring as is required to be undertaken by the Appointed Actuary. The link to the insurance supervisor is effected through the professional duty to "blow the whistle" if the Board or the management of the company persists in pursuing a strategy which the Appointed Actuary believes may have a serious adverse financial impact on the company, in spite of attempts to persuade them otherwise.

It is also recommended, in another guidance note (GN2), that the Appointed Actuary should report regularly to the Board of Directors on the possible future financial condition of the company. This requires work to be carried out on a dynamic financial analysis of the company, investigating the possible impact on the future financial condition of a variety of plausible adverse scenarios (using either deterministic or stochastic methodology). The idea is to help the Board to understand the risks to which the company is most vulnerable, and to formulate strategies for managing and controlling those risks.

The extent of professional control over the role of the Appointed Actuary in the U.K. was made possible by the stature and historical position of the actuarial profession. This has been reinforced by the legislation, which requires the Appointed Actuary to certify each year to the insurance supervisor that the mandatory actuarial standards of practise have been complied with. There are procedures whereby the insurance supervisor can approve someone as an Appointed Actuary who has some other actuarial qualification, but this is made conditional on the individual becoming an Affiliate Member of the Institute

of Actuaries, and hence subject to all the requirements of the profession, including the standards of practise.

The Faculty and Institute of Actuaries only permit their members to take a position as Appointed Actuary of a life insurance company if they hold a current practising certificate from the profession. In deciding whether to grant such a certificate, the profession requires evidence of several years' relevant practical experience, an unblemished professional record and up-to-date compliance with the requirements of the Continuing Professional Development (CPD) Scheme. The profession could decline to renew the certificate if there was good evidence of failure to comply with the code of conduct or applicable standards of practise.

An insurance company must notify a change of Appointed Actuary to the supervisory authority, but does not need the supervisor's approval for the new appointment. On receiving such a notification, the Government Actuary, as principal actuarial adviser to the supervisor, will invite the new Appointed Actuary for an informal discussion on the role and, in particular, on the extent to which he or she has made arrangements to be in a position to comply with the profession's standards of practise, including matters such as direct access to the Board, influence within the senior management structure, ability to monitor and influence premium rate adequacy, the reinsurance programme, investment policy, etc. The new appointee is also required (by the profession) to consult with the previous incumbent, in order to establish if there are any professional reasons why he or she should not accept the position.

An extended discussion of the role of the Appointed Actuary may be found in Johnston (1989).

6. International comparisons

Canada

Canada has adopted many of the features of the original U.K. Appointed Actuary model, but has adapted the system to a different regulatory and legal environment and has expanded the role to general insurance companies. Both life and general insurance companies are required to appoint an actuary, and there is a high degree of involvement by the Canadian Institute of Actuaries (CIA), of which the Appointed Actuary must be a member in good standing. Because of the perceived risk of litigation, the insurance legislation affords the Appointed Actuary certain protection against civil suit. The requirement to blow the whistle to the regulator is contained in the federal legislation, rather than in professional standards of practise. The Appointed Actuary's scope for professional judgement is somewhat more constrained than in the U.K., since the CIA issues more detailed standards of practise than the U.K. profession, and the technical provisions are expected to satisfy generally accepted accounting practise as well as the supervisor's interest in adequate technical provisions. To err too much on the side of conservatism is, therefore, as unacceptable as to under-reserve. The Appointed Actuary is responsible for the calculation of the risk-based capital requirement (Minimum Continuing Capital and Surplus Requirement, or MCCSR), and is also required to report to the Board of Directors regularly on the results of dynamic capital adequacy testing (DCAT), along similar lines to the dynamic financial analysis referred to above in the context of the U.K.

United States

The United States has not yet introduced a full appointed actuary system. On the life side the role has changed in recent years from evaluating the liabilities in accordance with regulatory norms to providing an opinion as to whether the assets are adequate to cover the liabilities. Cash-flow testing, using prescribed investment scenarios, is required to be carried out on a quarterly basis to ensure that, on a realistic basis,

assets equal to the statutory liabilities are sufficient to enable policy benefits to be paid out. The scenarios are prescribed by each state regulator but tend to follow those first set by the New York Insurance Department. The actuarial profession has played a significant role in the development of risk-based capital requirements, which have been adopted in all U.S. jurisdictions through the influence of the National Association of Insurance Commissioners (NAIC). A number of states have also introduced the concept of an “illustrations actuary” to ensure that excessive benefits are not projected at the point of sale. Proposals are under discussion to place greater responsibility on the actuary for product design and marketing disclosure, in order to support a move away from guaranteed surrender values, and also possibly to give greater discretion to the actuary with regard to the reserving basis.

European Union

Significant changes have been taking place in insurance regulation in some continental European countries, following the move to the concept of a single licence to operate throughout the European Union (EU). The “framework” directives that completed this process now prevent EU supervisory authorities from exercising prior control on products or premium rates. This has forced a switch from material to normative controls and has greatly increased the responsibilities placed on actuaries in some countries.

Ireland

With a regulatory set-up quite similar to that in the U.K., the Appointed Actuary system is operated, with a Society of Actuaries guidance note closely based on GN1.

Germany

In Germany new insurance legislation requires each life insurance company to appoint a responsible actuary (verantwortlicher Aktuar), who has to take professional responsibility for ensuring the adequacy of premium rates and for ensuring that the principles of rating and reserving which are included in the law are observed. The responsible actuary is responsible for reporting to the board of directors on proposals for bonus distribution to policyholders and has a whistle-blowing role similar to that of the U.K. Appointed Actuary. To underpin this important change in the role of the actuary, German actuaries founded the Association of German Actuaries (DAV, or Deutsche Aktuarvereinigung) which now exists besides the German Society of Insurance Mathematics (DGVM, or Deutsche Gesellschaft für Versicherungsmathematik), the latter’s objectives being the promotion of actuarial science. The DAV has tight entry standards for full members, and operates as a professional body, with appropriate standards of professional practise and conduct. The German supervisory authority approves responsible actuaries and, although membership of the DAV is not a requirement, it is seen as a strong positive indication (Janotta-Simons, 1998).

Italy

Italy has for some years had a requirement for an actuarial opinion on the technical provisions of a general insurance company. This opinion has to be provided to the auditor of the general insurance company, as part of the process of establishing whether the accounts show a true and fair view of the financial situation of the company. After several years of debate, it now seems that an Appointed Actuary role will soon be introduced in respect of the life insurance business.

Scandinavia

Finland has for some years had a significant level of responsibility for the actuary of both life and non-life companies, although they did not describe the position as Appointed Actuary. The responsibilities have in the past focused more on the liabilities side of the business, but the actuary is increasingly involved in overall financial management, a situation which also pertains in Sweden and in Denmark. The Scandinavian countries have always been strong in the mathematical aspects of an actuary's training, but the actuarial associations have recently begun to give special attention to the financial and investment aspects, which have not been as well covered in initial university-based education, but are important for the modern concept of the actuary's role. Additional subjects may be introduced through a post-qualification CPD process, or, for future "appointed actuaries", by requiring further professional examinations to be passed after completing the basic actuarial examinations.

Belgium and the Netherlands

Belgium has introduced its own version of the appointed actuary system, for both life and general insurance companies. The Netherlands has a longer tradition of actuarial professional responsibilities in the area of designing and pricing products for life insurance and in respect of non-life reserving. The Dutch actuarial profession (Het Actuarieel Genootschap) also has more experience than most Continental European actuarial associations of developing postgraduate education programmes and comprehensive CPD opportunities.

Switzerland

Switzerland has adopted the same terminology as Germany in the German-language version of the new insurance law. Switzerland is not a member of the EU, though it is bound by the general insurance directives under a special mutual recognition treaty that effectively incorporates Switzerland into the single EU market for non-life risks. The responsible actuary role in Switzerland is to be introduced for general insurance companies as well as life insurers (the new law is likely to come into force in 2000). Reinsurers will also be required to comply and, if they are composite reinsurers, to appoint both a responsible life actuary and a responsible non-life actuary. The actuary will be responsible for the integrity of the data needed for pricing and for valuation purposes, as well as for calculating adequate premium rates, prudent provisions and assessing the solvency margin requirement. He or she will also be required to monitor all developments that could affect the financial position.

France

An important exception to the general trend towards giving company actuaries greater professional responsibility may be observed in France, where a rather different tradition has grown up. Although France moved away from a detailed prior-approval system of regulation several years before Germany, it has not considered it appropriate to give a specific role to the insurance company actuary within the insurance law, other than a modest responsibility for approving the use of mortality tables. Responsibility for proper pricing of products, establishing prudent technical provisions and exercising sound and prudent overall financial management rests with the company's Chief Executive and the Board of Directors. Ensuring appropriate actuarial input is just one of the responsibilities of management. In order to monitor the financial position of insurance companies, and ensure that products are soundly priced and that proper provisions are established, the French authorities consider that there is no satisfactory alternative but for this to be regarded as a key responsibility of the insurance supervisor. Thus, supervision is based on a strong level of "contrôle sur place" (control on location, *i.e.* in the company) to accompany control based on reported financial statements. The Corps de Commissaires Contrôleurs consists of flying squads of

technician supervisors, with accounting and actuarial expertise, who not only review the financial statements of their allocated companies, but pay extended visits to the companies to review their systems and controls, approve their technical bases and methodologies and audit a sample of their calculations.

Other Countries

Outside Europe and North America, Australia and South Africa both have a long-established professional role for the actuary in environments where supervision has always concentrated on reserve adequacy and financial strength. Japan had a tradition more closely akin to that of Germany, but has now introduced a form of appointed actuary system (Hoken-Keirin) as part of the deregulatory modifications to the insurance law. The Institute of Actuaries of Japan has issued a standard of practise which was strongly influenced by the U.K. standard GN1. Hong Kong, Singapore and Malaysia have appointed actuary systems and place considerable professional responsibility on the actuary. Other countries in East Asia do not have a strong professional role for the actuary and rely on more prescriptive regulation. This is also the case in most Latin American countries and, to an extent, in the countries in transition in Central and Eastern Europe. In most of the latter countries the actuarial profession has recently undergone a rebirth and actuarial associations are still at an early stage of development. Insurance supervisors in many of the countries would like to delegate more responsibility to professional actuaries, having regard to the general lack of expertise and professionalism in the insurance industry, and difficulties in compensating for this within the supervisory authority itself. Emergency programmes of actuarial education, coupled with the creation and rapid development of embryonic professional associations, offer some hope of successfully addressing a difficult situation, although developing a culture of professionalism in short order is not an easy task.

7. Regulatory roles in general insurance

From year-end 1997 all active syndicates at Lloyd's of London have been required to obtain an actuarial opinion on the provisions established. When first introduced there were exclusions for reinsurance bad debt provisions and unallocated loss expense provisions. However, these elements are covered by the actuarial opinions as at 31 December 1998.

Guidance is provided by the U.K. actuarial profession in GN20 to actuaries undertaking this work and there are also separate advisory notes covering reinsurance bad debts, unallocated claims handling expenses and Y2K exposures. The uncertainties surrounding reserving for Y2K are recognised in the form of the opinion required for 31 December 1998.

The actuarial opinion is required under Lloyd's regulations, but is effectively a statutory role because of the approval of these regulations by the Insurance Directorate of HM Treasury as part of the procedures under the Lloyd's Act 1982 for the approval of Lloyd's rules for valuing assets and liabilities. The actuarial guidance insists that an actuary giving such an opinion must also prepare a report which conforms with guidance note GN12. In practise Lloyd's regulatory department asks to see these reports.

General insurance companies wishing to write excess and surplus lines business in the United States are required by the International Insurers Department (formerly NAIIO) to certify the adequacy of their reserves each year. GN18 provides guidance to actuaries who are involved in providing such certification.

The U.S. authorities also require various actuarial opinions to protect the position of U.S. policyholders insured at Lloyd's. Guidance is provided to actuaries giving such opinions in GN33.

There is as yet no general requirement for actuarial opinions in respect of the UK general insurance company market, nor indeed any statutory requirement to take actuarial advice. Insurance Directorate of HM Treasury does, however, have the power to request an actuarial report on the technical provisions or on the overall financial strength of the company, particularly if they have concerns about the company's financial strength.

Formal regulatory roles for actuaries in general insurance are becoming increasingly common in other countries. As mentioned in Section 6, the appointed actuary system (or similar) has been extended to general insurance companies in Canada, Belgium, Finland and Switzerland and actuarial opinions on non-life provisions are required in Italy.

Property/casualty (P/C) insurance companies in the United States are required, under NAIC filing rules, to have their loss reserves (outstanding claims provisions) certified by an actuary. The actuarial profession assisted the NAIC in the development of a risk-based capital requirement for P/C companies and has been working towards a more developed Appointed Actuary role, including dynamic financial analysis (or dynamic solvency testing), for which the Casualty Actuarial Society has developed a manual.

It would be reasonable to anticipate growth in the regulatory role of the actuary in general insurance. Possible future levels of involvement would be:

- actuarial opinion; and
- actuarial opinion on overall financial strength (including dynamic financial analysis).

8. Supervisory actuaries

The emphasis in most of this paper has been on the role of actuaries in insurance companies, or advising the companies as consultants. Whilst some supervisory systems operate with little or no actuarial expertise in the supervisory authority itself (or available to it on a consultancy basis), this is not generally felt to be a desirable state of affairs. In a system relying on prior approval of premium rates, such prior approval can only effectively be implemented if there is a sound base of actuarial expertise in the supervisory authority. However, in some respects the degree of actuarial sophistication required within the supervisory authority is even greater when substantial delegated responsibility is given to company-appointed actuaries or similar. A deregulated market tends to generate a proliferation of different types of product and a range of insurance companies in a variety of financial states. Freedoms given to Appointed Actuaries to determine appropriate reserving bases, coupled with a tendency to adopt fair value methods of valuing liabilities to sit alongside fair value (market-based valuation) of the assets, lead to considerable variation in reserving assumptions. Furthermore, the move away from a direct correspondence between pricing assumptions and reserving assumptions opens the way for business to be written that is expected to be profitable over its full term, but generates initial reserving strains (new business strain). Monitoring the adequacy of capital to enable such business to be written at the planned (or actual) level is an important task for the appointed actuary.

The result of all of these factors is that the task of monitoring the financial strength of assurance companies, and confirming that appointed actuaries are complying with regulatory requirements and with actuarial standards of practise, becomes one of considerable actuarial sophistication, which requires experienced actuaries with practical knowledge of the insurance market and, preferably, personal experience as an Appointed Actuary or in direct support of an Appointed Actuary. Part of this load may be able to be shared with the actuarial profession through a peer review requirement, such as is being considered in Canada. Experienced actuaries in a supervisory role are in a strong position to read between the lines of insurance company financial statements and actuarial reports, and to engage the Appointed Actuary in dialogue about the prudence of the valuation and the risks facing the company.

Actuaries within the supervisory structure can also assist non-actuarial supervisors to understand better what is going on in an insurance company, can help in the formulation of sensible and practical regulatory requirements, can help to devise solutions to problems which best protect the interests and reasonable expectations of policyholders, and can act as an effective communication bridge between the supervisory authority and the actuarial profession.

As with the role of Appointed Actuary within a company, there are the options of having in-house actuarial expertise within the supervisory authority, or of using consultants. The consultant option may present problems of conflict of interest if any members of the consulting firm are professionally engaged in advising insurance companies in the same jurisdiction. Actuarial firms would usually be reluctant to withdraw from what is likely to be more profitable business advising insurance companies in order to concentrate on advising the supervisor. For small jurisdictions this option may be quite practicable, using a consulting firm from another country, although this approach has some limitations because of potential lack of familiarity with the local market situation and the problems caused by insufficiently close and frequent contact between the supervisors and their actuarial advisers.

There are some advantages in the in-house option, as it undoubtedly encourages the involvement of the actuaries in all aspects of the supervisory and regulatory process. A disadvantage, unless there is a sizeable team of supervisory actuaries, may be a degree of professional isolation, a feeling which may be exacerbated into a trench mentality if much of the time is spent “fighting battles” with companies and their Appointed Actuaries. A common problem with the in-house solution is that of establishing a satisfactory level of remuneration, as government departments and agencies, even with the degree of operational independence which is not unusual for an insurance supervisory authority, are frequently not geared up to paying realistic professional salaries so as to be able to recruit high-quality experienced actuarial personnel. Some supervisory authorities have found it easier to deal with this remuneration issue once they have achieved financial independence from the government budget, for example by passing on the full costs of the supervisory operation to the insurance companies themselves through licence fees and annual renewal charges.

The solution adopted in the United Kingdom has been to create a specialist consultancy organisation within government to provide actuarial services, not only to the insurance supervisory authority, but to the supervisors of pension funds, to the social security administration, to social security and complementary pensions policy-makers and to government departments and other public-sector bodies in respect of the occupational pension arrangements for their employees. A significant part of the Government Actuary’s Department, or GAD, as it is known, is dedicated to providing consultancy support and advice to the insurance supervisory authority. Whilst not being located in the same building, they are near enough to be available for meetings, they have a close and continuing relationship, dedicated expertise and experience, whilst forming part of a reasonably sized actuarial “firm” that can attract actuaries of the appropriate calibre and experience, set remuneration at a sufficiently attractive level to recruit and retain staff, and offer a supportive professional environment. In addition, there is a Government Actuary at the helm, who carries a high level of authority and commands respect both within the actuarial profession and within the higher echelons of government. The GAD is itself financially independent, charging fees for its services, and the cost of the service provided to the insurance supervisory authority is passed on to the insurance industry in annual charges for having an authorisation to write insurance business.

9. Conclusion

This paper has outlined the importance of the actuarial profession from the point of view of modern systems of supervision of the insurance industry. In many ways the role of the actuary is even more vital from the commercial perspective of the insurance companies, because of his or her role in setting premium

rates and in the overall financial management of the business. Nevertheless, the role of the actuary, both within the insurance companies and in the position of supervisor, is critical to the maintenance of financially sound insurance companies, both for life insurance and general insurance. Deregulated insurance markets place additional demands on the actuarial profession, leading to effective solutions along the lines of the Appointed Actuary system and its many variants. It seems likely that solutions of this general type will become increasingly widespread, necessitating high levels of actuarial education and professionalism, and requiring the active support and involvement of professional associations of actuaries in each country. The role of the actuary will progress steadily away from historic evaluation of the liabilities to monitoring the adequacy of assets to meet the liabilities on a continuous basis, with a strong forward-looking role report to Boards of Directors on future financial conditions, thus playing a key role in the identification of risk and its successful management

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