J.I.A. **119,** I, 163–168

REVIEWS

Insurance in the EEC—The European Community's Programme for a new Regime, an Industry Report. Prepared by CLIFFORD CHANCE (Lloyd's of London Press Ltd., 1990) £75.00

As we are now in 1992, the year targeted for completion of the 'single market', it is timely to consider the progress made to date and the many outstanding issues to be addressed in creating a single market in insurance. For such a task this Industry Report by Clifford Chance will prove a useful companion.

It is essentially a descriptive factual account of the new EC insurance regime with some useful annexes on the status of the various Insurance Directives. Analysis of the effects of the single market is given a less important role in the publication, but it still contains some perceptive comments such as "harmonisation of laws and trade liberalisation has limits. These are often defined by persistent barriers to free trade, largely created by historical and cultural conditions. These barriers may endure despite the introduction of the single market programme, and may take some time to dismantle." A cautionary note for Eurocrats and managements of Insurance Companies, pursuing European expansion!

The 1992 programme is traced back to the Treaty of Rome and the two principles key to the achievement of a single EC insurance market: the right of establishment and the right to provide services. The first of these was enshrined in the First Non-Life and First Life Insurance Directives which are briefly described. The scope of the less well known Co-Insurance and Brokers Directives are also described, as is the 1964 Reinsurance Directive, which is a reminder that the EC was harmonising before we joined and could continue harmonisation without us.

The substantial differences in insurance premiums per capita throughout the community are cited as offering wide scope for an EC wide industry to develop, but this is perhaps an oversimplification. Differing tax regimes are identified as a key barrier to the single insurance market and, in particular, it is stated that a 'level playing field' can only be achieved in the life insurance market if taxation is harmonised.

Any reference to the widely held view that such harmonisation is unlikely this decade is omitted, as is any discussion of the powerful force of passive harmonisation which the Commission increasingly appears to favour. Throwing open the doors to free flows of capital and freedom of services in life insurance will, I believe, concentrate our legislators' minds wonderfully on the need to bring tax legislation into line with the rest of Europe.

The authors point out that spending on insurance per head in the EC is £334 against £616 in the U.S.A. and take this as a pointer to future growth for the sector in a harmonised EC market. Whatever the conclusion, the evidence produced is questionable. Those frustrated by the apparently slow progress towards a single insurance market in Europe may do well to consider the U.S.A. where there is still no 'single licence' and insurers are regulated state by state.

The publication is least satisfactory in the chapter outlining the current position in individual member states, although the reader is forewarned of possible shortcomings in this area. In relation to individual insurance companies these are unavoidable, given the pace of merger and acquisition. However, references to 1987 market statistics in a 1990 publication are less excusable, and I noted one major omission in the country details. However, the table of insurance legislation by country does give an interesting snapshot of progress towards a single market, and how the pace has varied between member states.

The ease with which a publication such as this can be overtaken by events is well illustrated by the content of the main chapter, which focuses on the Second Non-life and Second Life Directives in some detail, and supports this with two annexes setting out the full wording for both Directives. While the chapter contains useful background on the Directives and important Court cases, the knowledge that they have largely been superseded by the Third Non-Life and Life Framework Directives makes the chapter more of historical interest than a guide to the future of insurance in Europe. However, the clear explanation of terms such as 'cumul' will be of undoubted value to the uninitiated. The wider picture on progress towards a single market in insurance is also presented covering Directives less familiar, perhaps, to the majority of actuaries such as Credit and Suretyship, Motor, and Legal Expenses Insurance.

The Insurance Company Accounts Directive is given disappointingly little space, despite its implications for Non-Life Technical Reserves and its recent prominence in the debate on the ABI proposals for the reporting of Life Insurance Company profits.

The wider picture affecting the single market beyond the specific Insurance Directives is well covered, including the proposed statute for a European Company, independent of national laws, together with EC jurisdiction over large mergers and, most fundamentally for the single market in insurance, the programme for liberalisation of capital movements. An important aspect is the use of Article 85 of the Treaty of Rome by the Commission to combat arrangements restricting competition between insurance companies in areas such as premium rates and policy conditions.

Some EC measures, such as the Product Liability Directive and the proposed EC wide system of civil liability for pollution, threaten to increase insurance claims costs rather than increase business opportunities.

The final two chapters of the Report are a timely reminder that there is a bigger and rapidly changing world outside the EC, and the effect of the EC regime on non-member states and global participants in insurance is briefly commented on. The OECD and GATT are presented as scrutinising and closely watching EC moves towards a single market, in case of the effect it may have on the wider trade in insurance and financial services generally. EC reciprocity rules fall short of 'Fortress Europe', but still may cause problems and conflicts with the OECD Code for insurance sectors and also for Trade Treaties with the U.S.A. This is certainly an unhelpful picture at a time when the current slow moving GATT round envisages a much wider world single market in services.

The authors end on a cautionary note "The liberalised EC insurance market is likely to produce casualties as well as victors. Greater competition carries with it the possibility of failure, as well as the potential for success."

As stated earlier, events have overtaken this publication, and perhaps the best compliment to the work of its authors is to say that I, and I am sure other actuaries, would look forward to a further volume incorporating the Third Non-Life and Life Directives and the Accounts Directive.

M. J. BRENNAN

Insurance in a Changing Europe, 1990–1995. BY ARTHUR ANDERSEN & CO. (The Economist Publications, 1990) £125.00

This publication presents the results of a 1990 survey into the views of senior executives of European insurance companies. It covers both life and general business. The executives were asked a wide range of questions, focusing on:

— identifying and analysing the forces at work in the European insurance market,
— evaluating the impact of these forces on the sector's structure and profitability, and
— identifying likely management responses.

An analysis of the executives' replies forms the major part of this book. It is divided into two main sections. Initially responses are considered in general at a European level. Subsequently individual countries are analysed in detail. It should be mentioned that the range of countries considered covers most of Western Europe, not just the EC.

I suspect the general reader will find the pan-European sections of greater interest than the country sections, although individual countries will be of clear interest to some. The style of the narrative is essentially to draw out the main points of the analysis of responses. This style can be a little dry, though occasionally the text is enlivened when the authors take the opportunity to express views of their own, and this is particularly noticeable with their analysis of IT developments and associated problems. The text is illustrated by a large number of diagrams. The diagrams are often very 'busy', with much information crammed into a smallish space. Sometimes I felt a simpler presentation of the results would have been helpful.

Tentative conclusions are drawn on the results. These tend to summarise the results rather than drawing inferences from them. However, they can be used to gain quick indications of the contents of a particular chapter.

The views expressed are subjective, and must necessarily be placed in the context of the time when they were given. At the time of this review the impact of the continuing recession already raises doubts as to the validity of some of the views given. It would be an interesting exercise for the publishers to review this survey in 1995 and compare actual versus expected. However, in the meantime this book should prove useful to individuals involved with the strategic management of insurance companies.

D. N. ROBERTS

Portfolio Selection, Efficient Diversification of Investments. BY HARRY M. MARKOWITZ (Basil Blackwell, 1991) £25.00

Nobel Laureate Professor Markowitz has released the second edition of his 1959 seminal monograph, in his words "... in the hope that it will still be of interest to some: either as a historical document which many cite as laying the foundations of modern investment theory; or as my own statement of justification for the use of mean-variance ..., analysis; or as an exposition of these ideas for the practitioner with limited mathematical background".

This edition comprises the 1959 text; the bibliography contributed by Mark Rubinstein for the second printing (1970); and additional notes on the later chapters which comment on more recent work in the field, with the relevant citations. This edition ends with some autobiographical notes explaining, *inter alia,* how the author became interested in this field of research and the computing problems he faced at that time.

Although Markowitz' ideas were first developed in his Ph.D. thesis and his 1952 paper in the *Journal of Finance,* Portfolio Selection was aimed at investment practitioners who were not necessarily mathematicians. Accordingly Parts I and II (Chapters 1-6) develop, at some length, the tools of elementary probability theory and statistics, in so far as they are needed to describe the uncertain nature of the returns of risky assets.

Part III concentrates initially on geometric illustrations of 'efficient sets'. A portfolio is defined as efficient if, for example, it is not possible to find one with a higher expected return and the same (or lower) variance of returns. The elements of matrix algebra are developed and then illustrated with four-stock portfolios: this section includes ample exercises for the student. The final chapter of Part III considers the concept of semi-variance (in which the squares of positive returns are taken as zero) as a measure of risk.

The final part of the main text 'Rational Choice Under Uncertainty', develops the concept of expected utility and discusses, at some length, the strategies to be adopted by a 'Rational Man'— which highlights some fascinating apparent contradictions. These notions are illustrated by beautifully exaggerated examples of choice, as an introduction to the rigorous mathematical exposition. The extension to multiperiod analysis uses ideas from dynamic programming. The discussion on 'probability beliefs' demonstrates how the rational selection process is equivalent to utility optimisation under a set of 'personal' probabilities. The final chapter draws together all these ideas for the selection of portfolios, and for the first time shows how frictions (such as tax and illiquidity) can be allowed for.

Computational procedures for the identification of efficient portfolios (including modifications to the simplex method) are confined to the Appendices, as is a mathematical exploration of alternative axiom systems for expected utility.

Markowitz' original work has, over the years, spawned countless papers and a variety of simplified approaches. Sharpe's diagonal model (in which all the covariances between the specific risk terms are taken as zero) leads to the familiar market model with stocks' returns characterised by alpha and beta. This has given quantitative analysts (and MBA students) a tractable method for exploring efficient portfolios with limited data and computer resources. With inexpensive computer power and easily accessible stock return histories, the implementation of Markovitz' original approach is now quite feasible, without the artificial simplifying assumptions.

The notes on the original text (by the acknowledged father of Modern Portfolio Theory) form an invaluable overview of the whole subject, and include scores of references for further study. Particularly interesting is the explanation of how the familiar market model differs from the Capital Asset Pricing Model, and how the modification (or elimination) of one or more of the underlying premises gives rise to alternative descriptions of the relationship between stock returns.

KEITH FELDMAN

Guide to Life Assurance Underwriting. BY KEITH SANKEY (Buckley Press) £14.95

This guide is, as stated in its Introduction, a description in layman's terms of the underwriter's role. The qualified actuary will have acquired some knowledge of the subject during studies for the examinations, and further knowledge through his employment; so within the actuarial profession the Guide's greatest use will be to students. However, the term 'best advice' under the Financial Services Act necessitates more than a mere smattering of what the underwriter does, and the Guide should at least be optional reading in the examination syllabus and in post-graduate studies.

Chapter 1 gives an introduction to the reasons for underwriting, and goes into the adverse experience under the 'no questions' policies written circa 1983; and Chapter 2 describes the information the underwriter needs, and includes a section on AIDS and HIV; it also gives a summary of the effects of the Access to Medical Reports Act.

The meat of the Guide is found in the long Chapter 3 on medical impairments, underwriting requirements, and extra ratings. It is divided into 17 sections, each dealing with a separate group of impairments. The symptoms present in certain diseases are described, and in this respect the chapter can be a mine of information to the layman. Rightly, there is a warning that the views of life offices differ amongst themselves in their attitude to impaired lives; accordingly this chapter should be regarded as a guide rather than as a bible.

Chapter 4 deals with PHI and disability cover, and occupies 6 pages only, to indicate where underwriting for these classes of insurance differs from life underwriting. Perhaps a subsequent revision might treat this important subject at greater length.

There follows a short chapter on 'Dread Disease' cover, a relatively new form of insurance in the U.K. This chapter might also be extended in a future edition when there has been more experience in this country.

The final chapter, on Financial Underwriting, considers the possible financial backgrounds to proposals, particularly where there is to be a high sum assured for a low premium.

The Guide ends with a useful glossary of medical terms.

The acknowledgement to those who checked figures and spellings is a challenge to any reviewer; however, only one spelling error was discovered in its 165 pages.

H. A. R. BARNETT

SCOR Notes: International Prize in Actuarial Science, April 1991, Papers by (1) G. C. TAYLOR, (2) C. R. LARSEN, C. DENGSØE, J. H. EGEBO & J. E. HANSEN, AND (3) H. D. TOLLEY & K. G. MANTON

In November 1989 the French reinsurance company, SCOR S.A. announced its first international prize competition in Actuarial Science. It was stipulated that if none of the entries met the high standards of the selection committee, the prize would be held over until the following year. In the event, a very high overall standard was achieved and the prize was awarded to Gregory C. Taylor for his excellent and original paper dealing with the 'Valuation of a non-life insurance company for purchase'.

The SCOR Notes, April 1991, reproduces Dr Taylor's paper, together with the second prizewinner, 'Risk analysis of customers--not products', by Larsen, Dengsøe, Egebo and Hansen and the third prizewinner, 'A grade of membership for partitioning heterogeneity in a collective', by Professors Tolley and Manton. In each case there is a concise summary of the aims and contents of the paper, which will assist readers seeking practical guidance, and will also assist future researchers in any attempt they may make to build on the methods and theories described.

Dr Taylor's paper has the very practical objective of formulating a basis which will guide a potential purchaser of a non-life insurance company towards a carefully reasoned purchasing valuation. There are a large number of relevant factors and the paper discusses these in considerable detail. It soon becomes clear that, although the research and information required in order to make a proper judgement of the value of the 'target' insurance company is extensive, as most actuaries will appreciate, there are distinctive methodologies which can and should be applied, and the paper blends clarity of verbal exposition with a scholarly mathematical technique in an admirable manner.

In his introduction Dr Taylor draws attention to the pre-print of Ryan & Larners' Institute paper on the same subject which was circulated when his paper had reached an advanced stage (*J.I.A.* **117**, 597). The author, however, delves more deeply into the quantitative aspects of insurer valuation and the two papers may be regarded as complementary. Dr Taylor sets out an 'anatomy of a valuation' in the form of a useful flowchart with each element in the flowchart indexed to the relevant paragraph in the text. Following the flowchart has the advantage that, where practical considerations enforce an abbreviation of the valuation process, it is possible to evaluate the risk inherent in the foreshortened treatments.

Part B of the paper encompasses details of an Asset related valuation and sets out the mathematical formulae for the valuation of reinsurance creditors and debtors, and includes the allowances for the incidence of risk and provisions for claims escalation and investment returns. The author points out that different lines of business differ considerably one from another, and hence there is a need for 'line by line' assessment. This section concludes with a claims process model, including the provision for premium deficiency.

Part C moves on to Earnings related valuations, which builds on the simplistic base that the value of any business has two determinants. These are, first the expectation (in the statistical sense) of future profits and, secondly, the risk that such expected profits will not be realised. This is developed mathematically in detail and the paper also contains a section on the generally accepted capital asset pricing model (CAPM).

Part D describes the interrelationships between the economic variables, including portfolio composition and measurements of the rates of return. Allowance for tax and future inflation have an important effect on these.

The essential practicality of all preceding sections is emphasised in the detailed, excellent and instructive numerical example which provides a fitting culmination to this unique paper.

The second SCOR International Prizewinner, 'Risk analysis of customers—not products', by Larsen, Dengsøe, Egebo and Hansen, emanated largely from a recent trend in ever changing financial markets to gather the customers financial transactions into one place. This leads to the interesting question: "Will actuaries be able to evaluate an insurance portfolio more accurately if they choose to take the individual policyholder rather than the individual products as their starting point for risk analysis?" The question (and possible answers) are developed more fully and a series of conclusions are drawn.

Of particular general interest are the sections on an assessment of the value of an insurance portfolio, and the use of the traditional bonus-malus systems. The evaluation of 'the risk of a policyholder' by means of models and risk analysis at customer level is dealt with by means of more rigorous mathematical methods, but the use of figures relating to observed claims ratio experience for householders comprehensive insurance draws the threads of theory and practise together. Finally, consideration is given to the intriguing problem of how to optimise an insurance portfolio.

The third Prizewinner was 'A grade of membership method for partitioning heterogeneity in a collective', by Professors H. D. Tolley and K. G. Manton. The paper recognises the fact that heterogeneity in the portfolio is nearly universally recognised as a characteristic of the real world in most non-life insurance business, and that to be competitive actuaries and risk managers have developed a number of methods for estimating risk for blocks of business. A fundamental and elementary example of the method is the use of life tables (both single and multiple decrement). However, the paper extends the theory rigorously, and it is made clear that the components of risk in an individual or group can be more easily assessed if the random variable giving rise to the contingent event (e.g. a claim) is separated from the loss associated with the event (e.g. the amount of the claim).

The primary purpose of the paper is the presentation of a 'grade of membership (GOM) procedure' as a method of estimating aggregate portfolio risk. The paper also introduces actuaries to the new 'Fuzzy set theory'. Fuzzy set theory is a recently developed field of mathematics that introduces sets of objects whose boundaries are not sharply defined. It has found its most brilliant success in Japan (where it has been used to produce auto-focus systems in camcorders).

In the summary the point is made that, if the GOM model is considered as a method of assessing risk through data, the extent of the data collected and maintained by insurance companies must be expanded over that currently maintained by U.S. companies. The same may be said to be true in respect of U.K. companies.

R. W. Scadden