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REVIEWS

UK & European Share Price Behaviour: the Evidence, by PAUL H. RICHARDS
[Kogan Page, 1979]

Modern portfolio theory (as it is known in the United States) made its one actuarial appearance in Professor Moore's paper "Mathematical Models in Portfolio Selection" (*J.I.A.* **98**, 103), the discussion of which tended to dismiss it as of little practical interest, a conclusion which would have surprised many academics in the United States and even some investment practitioners. One is none the less inclined to take the view that in that great country, where relationships between investment managers and pension consultants, company pension officers, and trustees are often so deplorably acrimonious, the investment managers may hope that indifferent performance will be overlooked as long as they can show that they have applied assiduously the tools of science as taught in the best business schools.

This side of the water the field is less thoroughly but, one hopes, not less imaginatively tilled, and Paul Richards is to be commended for pulling together from various sources a number of statistical papers on investment and linking them with his own commentary. Curiously enough, his selection in the area covered by Professor Moore's paper (the chapter entitled "Risk and Return" in the book) is a very limited and rather uninteresting one. It might have been better either omitted or expanded with material on such subjects as the effect of transaction costs on risk and return and the consequences of various levels of forecasting ability. Equally, the final chapter "Efficiency in the European Stock Markets" is based on such limited information that it detracts from, rather than adds to, the overall picture.

The main thrust of the book, however, is contained in the three chapters on various forms of the efficient market hypothesis, which occupy three-quarters of its length. The weak form, "past share prices give no useful information about future share prices" might be accepted by the majority of stock market practitioners, but even here the evidence presented is not wholly conclusive. The semi-strong form "share prices reflect all published information on the company" seems more questionable—they may well reflect the earnings per share, but do they necessarily allow for that odd little item tucked away in Note 27 to the accounts? The evidence presented tends to the naïve—for instance, it can hardly be said that anything is proved by showing that bonus issues have no discernible effect on share prices, which is exactly the effect one would expect from a purely bookkeeping operation. The evidence presented on the strong form of the hypothesis "share prices reflect all that can be known about the company" mainly consists of examples of the inconsistency of investment performance by various types of investment fund. This may show that it is very difficult to achieve consistently successful (or unsuccessful) investment performance, but it does not seem to me to prove the hypothesis to be true.

Unfortunately, the author is inclined to make in his linking passages and conclusions a variety of portentous suggestions as to how investors should change the way they do their job. Most of these are not really justified by the text, and I feel that in many cases this was appreciated by the original authors of the papers printed. The book is effectively devoted only to equity investment. It is not an introductory text on modern portfolio theory, but might be usefully read by someone who has enough acquaintance with the subject not to be misled by the breadth of the author's assertions. It would be a good antidote for anyone who thinks success in equity investment is simple to achieve, but the practitioner worth his salt learns that pretty quickly anyway.

W. J. BISHOP

Survival Probabilities—The Goal of Risk Theory, by HILARY L. SEAL
[John Wiley, 1978]

As its name implies this book is concerned with ruin probabilities in a risk theoretic abstraction of a Non-Life Insurance operation. The problem of ruin in a finite time interval has become computationally accessible with the advent of powerful computers, and actual program listings form an appendix.

The early chapters of the book discuss the various elements of the model, in particular the process generating successive claims and the distribution of individual claim sizes. Some historical background to these aspects is given. The author is particularly concerned to demonstrate the strong similarity between the queue-theoretic model for a single server queue with service ordered by arrival time, and the usual risk theoretic model. Although superficially the problems with which queuing theory and risk theory are concerned are dissimilar, it can be shown that under certain conditions a connection is established between the two areas by the equivalence of the distribution function of virtual waiting time in the queuing context with probability of ruin in the risk context.

This connexion enables use to be made of standard results in queuing theory to reach the survival probability for a finite time interval. Unfortunately, queue-theoretic results are helpful only for independent claim inter-occurrence times and exponential claim size distribution: circumstances of limited applicability in insurance.

There follows a brief discussion of the Laplace Transform and its inversion, necessary for comprehension of the remaining sections of the book, which are concerned with the problem in the context of more general claim size distributions.

Use is made of indicator random variables to reach a formula which expresses the survival probability for given initial reserves and finite time in terms of the survival probabilities for zero initial reserves and finite time, and it is pointed out that in the general case the latter must be determined by solution of an integral equation. A simpler procedure can be reached by specifying a particular form for the distribution of claim occurrences. A variety of methods are used to reach numerical results and comparisons are made.

In a final chapter a number of methods are outlined for the approximate calculation of ruin probabilities for both finite and infinite horizons.

It will be clear from the above that this book will be most meaningful to those actuaries who are acquainted with the theory of stochastic processes, the theory of queues and who have a nodding acquaintance with Laplace Transforms and their inversion. However, even those not so equipped should be able to find something of interest: thus, for example, a program is given for approximating the finite horizon ruin probability without the use of transforms.

The emphasis is theoretical rather than practical although computational aspects, in themselves of considerable significance in this area, are considered at some length. Only passing reference is, however, made to problems arising in the practical context such as adequacy of claim reserves, inflation, etc. Although considerable attention is given to specific distributional forms for numbers of claims occurring in an interval and their costs, there is little consideration of the question of the goodness-of-fit of these models to data, and the importance of deviation of population from assumption. In particular, the question of the sensitivity of the ruin probability to the particular form of distributional tail fitted to data is one which arises naturally, and which tends to focus attention upon the adequacy of the models being used to represent the practical situation. Should the methods of inference used be dictated at least in part by the requirements of ruin theory?

The book can be recommended as both a stimulating and practical contribution to a problem of considerable current interest.

D. H. REID

Pension Schemes—A Guide to Principles and Practice, by MICHAEL PILCH and VICTOR WOOD [Gower Press, Farnborough, 1979]

One of the great difficulties of writing a book about pensions is to know when to bring it out. There have been so many developments over the last few years that it almost needs a continuous service to keep up to date. Messrs Pilch and Wood are very conscious of this and in fact this is the sixth book they have produced on the subject of pensions over the past twenty years or so.

This is a reflection of the speed with which changes occur in the world of pensions, a speed which has greatly accelerated since their fifth book *Managing Pension Schemes* was published in 1974. Even since the book under review came out there have been changes, two important examples being the lifting of exchange controls and the removal of the £5000 earnings limit for refunds of contributions on leaving employment.

The book is divided into three parts; the first called "The Background" has subheadings of Origins, Objectives, The Inland Revenue, and The Occupational Pensions Board. The second called "The Foreground" deals with such matters as Pension Scheme Design, Paying for Pensions, Administration, Objectives, Trusteeship, Communications, and Directors and Senior Executives. Part 3 is called "The Future" and discusses Political, Economic, Industrial, and Social Issues. Then follows an Appendix, the first part of which is a glossary of terms used and the second is a brief summary of relevant legislation. Parts 1 and 2 are to a large extent a re-writing of matter in previous books, bringing it up to date. Part 3 is new. It discusses many issues that do not generally form part of the run-of-the mill book on pensions and these consequently are of particular interest. The difference is so marked between the first two parts and the third part that the reviewer is not entirely clear as to whom the book is addressed.

Much of the book tends to be written for the point of view of the employer. One of the difficulties in advising on a pension fund is that almost always it is the employer who asks for the advice and not the employees. Therefore, the consultant's advice is more likely to be on the side of the employer than the employee. Consequently, there are implications in this book with which many actuaries may not agree—as for example on page 76 that flexibility of funding may in some circumstances be more important than its adequacy.

On page 78 it is suggested that the large number of applications for contracting out demonstrate that many employers were persuaded of the wisdom of so doing and also that they mistrusted future governments. The reviewer has frequently heard the same reasons given for not contracting out, while the reason for many firms contracting out was because it meant substantially smaller contributions from the employees, who asked for it.

The book covers such an enormous range of topics that it is impossible in a brief review to mention more than a few.

The chapter headed "The Occupational Pensions Board" is the second longest in the book and nearly all of it relates to preservation and contracting out, both of which are given possibly more detailed treatment than might be expected in a book of this nature.

A case is cited on page 94 of how pension fund rules can affect the social behaviour of beneficiaries. It was found that the result, in one very large company, of having a pension fund rule providing for widows' pensions to cease on remarriage, was that the rate of remarriage for widows was only one-sixth of that in the general population!

On page 102 the comments on administrative expenses will be an eye-opener for a lot of employers who think that their pension schemes are run at no cost to them.

The tables on pages 105–108 may puzzle actuarial readers. Each table has a column headed "Percentage of Premium Rate at Age 20" which is indicative of the rate of accumulation and it is not clear why it should differ between pages 105 and 106 and in the opposite direction between pages 107 and 108. On page 123 figures are quoted which again are different from these tables. Actuarial students will also be surprised to learn on page 204 that, for example, a woman aged 60 "may expect to live for 21·1 years".

On page 111 there is a well-justified plea for standardization of nomenclature of methods of funding. On page 140 the point is made that the value of a generous pension scheme is doubtful unless an explanation of its generosity can be communicated to the members. On page 191 the case is urged for the employees to have advisory bodies and committees of management rather than to have 'representatives' on the board of trustees.

On page 199 it is argued that if collective bargaining is used for pension schemes they ought to be money purchase schemes because the cost is well defined, and not be open-ended commitments such as final salary schemes—and that for the same reason, only in the case of a money purchase scheme are pensions deferred pay. These are all very good points.

The proof reading throughout has been efficient except in the last paragraph on page 204 where it seems some words may have been left out.

Overall, the book is full of good sound common sense and will provide useful background for those unfamiliar with the subject. Most of it is easy to read and it is in line with the thinking of the reviewer even if there are a few places where he would disagree with the opinion voiced, thus he would take issue with their comment, on the subject of fringe benefits, that a free haircut is worth little or nothing to a bald man. Bald men need haircuts like anybody else—and they are charged the same!

J. C. S. HYMANS

CORRESPONDENCE

I believe that my written contribution to the discussion on Messrs Ford and Masters' paper (*J.I.A.* **106,** 149) did not reach its destination, but perhaps I may be permitted to make the points in the form of a letter.

Mr Rowe noted that the majority of offices writing flexible endowment assurances projected the same rate of bonus on these assurances as they did on fixed-term endowments. He felt that this was inappropriate and that a separate bonus system should be used, preferably one with a large terminal or reparticipating element. In this he was supported by several other speakers. Nevertheless, the list of offices projecting identical bonus rates for both classes is impressive and it is reasonable to assume that they have done so after due consideration.

The approach suggested by Mr Rowe presents the office with the problem of deciding not only how the premium rates for flexible endowment assurances should differ from those for fixed-term endowment assurances, but also how the bonus rates should differ, and it presents the customer with his own problem in deciding how he should weigh the suitability of the one contract against the other. It is, on the contrary, quite reasonable for the office to proceed on the assumption that the same bonus system will operate for both classes of policy and then to decide what charge should be made for the option inherent in the flexible contract. After all, many offices declare the same bonus rate on other contracts which are not identical, e.g. whole-life and fixed-term endowment assurances.

Life offices issue several contracts involving options which may at times operate against the office. For example, currently many offices are issuing self-employed retirement annuities under which cash on a guaranteed basis may be uplifted by the policyholder to apply to an annuity purchase at any time of his choosing between age 60 and age 75. Here one is dealing with very substantial sums of money and with a policyholder who does not even need to retire before deciding to uplift his cash and draw his pension. He will, naturally, prefer to buy his pension at a time when annuity rates are high and the market low, i.e. at a time disadvantageous to the office for providing cash.

If an office issues a contract which permits an option the office should have the necessary financial backing, recognize the force of the option, make a reasonable charge for it, and hold appropriately strong reserves.

As was pointed out by Mr Proudfoot, the great preponderance of flexible endowment assurances are issued to relatively small savers who may be thought of as likely to pay the next premium securing higher benefits and further tax relief rather than to exercise a maturity option. Also, at any time a good proportion of an office's flexible endowment assurances will be less than ten years old. Many of those policies 'matured' at longer durations will be cashed for reasons which have nothing to do with the state of financial markets. Such maturities will on average be in no way disavantageous to the office.

It was noted during the discussion that investments are available suitable for matching against the liabilities under flexible endowment assurances. There is no reason why an office of sufficient strength should not take a view on this, as on other investment matters, and decide not to match the liabilities fully by such assets.

J. M. MACHARG