

REVIEWS

Survival Models and Their Estimation. By DICK LONDON, FSA published by ACTEX Publications, Winsted and Abington, Connecticut 1986.

This preliminary edition of the first eight chapters has been prepared for the use of those taking examinations of the Society of Actuaries.

The text provides a comprehensive treatment that combines traditional actuarial wisdom on the subject of Life Tables with the modern theory of Survival Analysis. Formulae traditionally used to construct the 'Exposed-to-Risk' in the denominator for purposes of calculating q_x , can today be reviewed in a new light when data is handled using computers. Using an example of five lives where the date of birth and date of death of each is given on page 142 the traditional actuarial formula for q_{20} is compared with one in which the deaths do not contribute a full unit of exposure to the denominator. The author concludes that "with large-scale studies totally computerized, the argument for the traditional practice loses much of its merit, and the alternative practice could just as easily be used."

In the plan of the present volume Chapter 1 is an Introduction that includes a description of Cross-sectional Studies and Longitudinal Studies. Chapter 2 covers mathematical definitions where the treatment is stochastic with the Hazard Rate defined as a conditional instantaneous measure of failure at time t , given survival to time t . Chapter 3 covers the Life Table in its traditional deterministic form in which l_x is the central concept. The remaining chapters form Part II of the book and are concerned with the estimation of Survival Models from Sample Data. The scope of the book is more limited than one might guess from the title. The models considered scarcely mention regression type or explanatory variables. Not many parametric distributions are considered explicitly other than Gompertz, Makeham, Exponential, and Weibull and these are only mentioned briefly.

As one might expect of an actuarial textbook there is a thorough treatment of the principles of Life Tables. There are numerous worked examples and exercises at the end of chapters to which answers are provided in the back of the book. It is an important advance in actuarial methodology to cover in an actuarial textbook the modern methodology of Kaplan-Meier product limit estimation. The use to which the book might be put by the Institute may be limited by the need to also include General Insurance methodology so Dick London's treatment may be found to have too much detail for our purposes. Certainly one can expect a new textbook that is designed specifically for the Institute's requirements to be very much influenced by this one.

PATRICK S. CARROLL.

An Introduction to Non-Life Insurance Mathematics. By BJØRN SUNDT published by Verlag Versicherungswirtschaft e.V., Karlsruhe (No. 28 in the series of University of Mannheim Insurance Texts.)

At the invitation of Elmar Helten as the editor of the Mannheim series, Bjørn Sundt wrote up his lecture notes from a course given in the summer of 1983 in Mannheim. The author has both academic experience of teaching and research, as well as first hand experience in a well known Norwegian insurance company. So the editor has reason to make the claim that "the present lecture notes are useful for actuaries both in theory and practice."

The main topics covered are Premium Principles, Credibility Theory, Bonus Systems, Risk Theory and Claims Reserves.

Treatment of Premium Principles is tantalizingly brief. Just a few pages are used to describe the mathematical faults of the Variance Principle. Credibility Theory is covered in about 30 pages with emphasis on the difference between Bayes and empirical Bayes approaches. Risk Theory is developed at more length and with equal mathematical sophistication. Some of the theorems are rigorous proofs of convergence in probability spaces. Claims reserves are treated concisely in about ten pages which include clear descriptions of the Chain-Ladder method, Taylor's separation method and the Straub approach.

The book covers in this way several important topics that no other textbook covers at a level that is suitable for actuarial students. If good mathematics graduates are to be attracted into the actuarial profession to take up the challenge posed by the problems of non-life insurance this book could usefully be placed in their hands. With a mathematical emphasis the book complements quite well the books that are in the present reading list for subject 5 which have a statistical emphasis. The author has an admirable grasp of both the relevant mathematical theory and the insurance practicalities. What may limit the use of the book in actuarial education is the lack of worked examples and the lack of examples that analyse data. The standard of English is quite high. Some printing errors do persist. The notation is not very satisfactory from a statistical standpoint as the convention of Greek letters to denote parameters is not followed consistently so the distinction between parameters and statistics is obscured especially when definitions are not made clear. Still the book is uniquely valuable and a rare bargain if it continues to be available at such a very low price.

PATRICK S. CARROLL.