obvious problems of moral hazard and of the political ramifications of enforcing such contracts, but does not dwell on these issues; this is a book of broad ideas rather than details.

In some cases the broad ideas are so far removed from extant financial markets or institutions that it becomes difficult to envisage their realisation. However, there are parallels which can be drawn with some recent developments e.g. the development of catastrophe insurance futures. In a U.K. context, while there are no retail products for insurance against a fall in the general level of house prices, equity investment products with derivative-backed guarantees are now well-established. Thus, private investors can now buy equities with a cash guarantee, but are obliged to bear the full price risk on their homes—an ironic state of affairs, considering that houses are usually financed on a highly-geared basis, while equities are usually bought with surplus cash.

The book glosses over many details, and it is easy to criticise particular proposals as incomplete, or vague, or impractical. However, the author's ideas ought to receive serious attention from the insurance industry—not least because, if insurers fail to develop them, other more innovative financial intermediaries will do so. It is to be hoped that actuaries will concentrate on refining Shiller's proposals rather than rejecting them out-of-hand because of initial scepticism about minor details.

R. G. THOMAS

Life Insurance, a Non-Life Approach. By BART KLING (Thesis Publishers, Amsterdam, 1993)

In this book—in fact the author's Ph.D. thesis—some well-known methods from non-life insurance are applied to life insurance problems. The focus is on the modelling of the insurance risk, and constant interest rates are used wherever investment assumptions are needed. The contents are:

Chapter 1 Introduction;
Chapter 2 Ordering of risks;
Chapter 3 Credibility theory;
Chapter 4 Portfolio models; and
Chapter 5 Conclusions.

Chapter 2 provides a useful introduction to ordering schemes for univariate and multivariate random variables. Ordering random variables leads to general results for the moments of suitable functions of the random variables, and these lead to simple proofs of inequalities between actuarial functions. Some of these results are extended to more general multiple-state models. There is also a discussion of the choice of benefit or premium plan to optimise a suitable function of the random loss under an insurance contract.

Chapter 3 is founded on the observation that Hachemeister's credibility model can be applied to more general non-linear regression problems, of which graduation of mortality rates is an example from life insurance. An example is given of a Makeham graduation, in which the parameters are modelled as random variables and play the rôle of the unobserved structure parameters in credibility theory.

Chapter 4 is mainly about recursive methods in non-life insurance. It discusses some generalisations of Panjer's recursion, and compares approaches to the recursive estimation of ruin probabilities.

The book will be interest to life insurance actuaries who wish to obtain a better understanding of the effects of insurance risk. Chapter 2, in particular, is a welcome demonstration that many properties of actuarial functions are rather simple consequences of a suitable stochastic approach. Actuaries interested in graduation might find Chapter 3 useful. A good knowledge of credibility theory would be needed to apply the author's methods, but there are also some interesting criticisms of some aspects of the conventional approach to testing a graduation.

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