

SYNOPSIS

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THEORY AND PRACTICE OF MULTINATIONAL POOLING

BY RAY WOOTTON, B.A., F.I.A.

(Synopsis of a paper presented to the Society on 4 December 1984)

THIS paper sets out to complement a paper entitled "Multinational Experience Rating", presented to the Faculty of Actuaries Students' Society on 3 December 1979 by G. C. Archibald and J. Wallace, by providing an in-depth analysis of the subject from the viewpoint of a life office actuary. It aims initially at an understanding of the basic concepts, particularly those of expected surplus and both random and *a priori* variation, but after that concentrates on the practical study of the various possible structures for pooling arrangements by the use of a computerized Monte Carlo technique, embodied in a PASCAL program. Results obtained from this program provide a simple way of handling complex losses-carried-forward arrangements as if they were on a yearly full stop loss basis but with a coefficient of variation reduced by the factor $T^{-\varepsilon}$ where

T is the average lifetime of pooling arrangements with the specified structure and

ε is a structure-dependent parameter.

Having prescribed bases for the operation of international pools the paper then goes on to consider the principles of apportionment of the risk and risk charge among the insurers participating in each pool and defines four different frameworks for the interrelation of these insurers.

The paper is organized under the following sequence of chapter headings:

1. Introduction
2. The fundamental experience-rating structure: Full Stop Loss.
3. The concept of expected surplus.
4. Theme and variations—the diversity of structure of Losses-carried-forward arrangements.
5. The interaction of structure and risk charges.
6. The interrelation of network insurers and the apportionment of risk and risk charges.
7. Miscellaneous problems.
8. Technical description of the computer simulation techniques and PASCAL programs used in arriving at the results presented in this paper.
9. Tables for approximate computation of the risk charge based on the POISSON distribution.