ABSTRACTS

DISCONTINUITY AT THE BOUNDARY

Beda Chan

To solve multiple choice problems by elimination, one approach is to study values of functions at the boundary. In this note, we show by examples that the method of boundary values can be risky if the tacit assumption of continuity at boundary is not checked.

ON THE DIFFERENCE BETWEEN BALDUCCI AND U.D.D.

Murray Silver

Several inequalities between the Balducci and U.D.D. curves are developed and discussed.

PROBLEMS IN AND A SYLLABUS FOR DEMOGRAPHY

John A. Beekman

A syllabus for demography is presented with numerous problems based on U.S. Census Bureau data. Many of these are projects for which each student uses data from a specific Standard Metropolitan Statistical Area. Population projection problems are included. In addition, two graduation of data projects based on SMSA data are described.

A MATHEMATICAL APPROACH TO YIELDS UNDER VARYING INVESTMENT CONDITIONS

A. Spedding

A generalized formula is developed to give the values after r years of single and regular investments made under varying investment conditions. The practical application of the formula for stated varying investment conditions is considered, followed by a re-examination of the concept of a redemption yield.

COUNTERPART EXPOSURE FORMULAS UNDER THE BALDUCCI AND UNIFORM DEATHS ASSUMPTIONS

H. J. Boom

To derive exposure formulas of the valuation schedule type on the basis of the Balducci assumption Gershenson and Batten use algebraic elimination, Batten adding rules of thumb for quickly finding the correct coefficients in specific cases. In the first portion of this paper we propose a shorter and, we hope, more elegant method of proof for formulas of this type as well as a short cut for the coefficients of the terms involving deaths.

We then proceed to derive a general exposure formula of the valuation-schedule type that may be used for all mortality studies with an observation period covering an integral number of consecutive years and give a general proof that this formula will lead to results identical to those produced by an individual record exposure formula based on the same assumptions.

Finally, the results obtained are extended by letting the assumption of a uniform distribution of deaths replace Balducci's assumption.

DUALITY BETWEEN UNIFORM DEATHS AND BALDUCCI ASSUMPTIONS

Elias S. W. Shiu

The U.D.D. assumption states that the function ${}_tp_x$ is linear in t for $0 \leq t \leq 1$, whereas the function ${}_{1-t}p_{x+t}$ is assumed to be linear in t under the Balducci hypothesis. Since $p_x = {}_tp_x \, {}_{1-t}p_{x+t}$, we expect a close "duality" relationship exists between these two assumptions. The purpose of this paper is to reinterpret the exposure formulas illustrating this duality.

RECENTLY PUBLISHED U.K. MORTALITY TABLES METHODS OF CONSTRUCTION AND POSSIBLE DEVELOPMENTS THEREFROM

J. J. McCutcheon

A graduation by cubic splines was used for the life tables for England, Wales and Scotland. The use of splines as an actuarial tool is perhaps not all that widespread and this paper describes their application to graduation. Suggestions for a possible improvement of the methods and some illustrations of these ideas are given.

The paper also discusses curve fitting based on maximum likelihood, which was used in the graduation of two new sets of tables published by the Continuous Mortality Investigation Committee of the Institute and Faculty of Actuaries. The projection basis for improvement in mortality is considered.