

MATHEMATICAL AND STATISTICAL MODELS

Linear Estimation and Credibility in Continuous Time, by Ragnar Norberg
(University of Copenhagen)

The theory of linear filtering of stochastic processes provides continuous time analogues of finite-dimensional linear Bayes estimators known to actuaries as credibility methods. In the present paper a self contained theory is built for processes of bounded variation, which are of particular relevance to insurance. Two methods for constructing the optimal estimator and its mean squared error are devised. Explicit solutions are obtained in a continuous time variation of Hachemeister's regression model and in a homogeneous doubly stochastic generalized Poisson process. The traditional discrete time set-up is compared to the one with continuous time, and some merits of the latter are pointed out. *Astin Bulletin*, November 1992, 22(2): 149-165. (Reprinted with permission of the *Astin Bulletin*.)

RUIN THEORY

On the Distribution of the Surplus Prior to Ruin, by David C. M. Dickson
(Heriot-Watt University, Edinburgh, UK)

The distribution of the surplus immediately prior to ruin in the classical compound Poisson risk model was considered in a paper by Dufresne and Gerber (1988). The main purpose of this paper is to present a simple method for finding the distribution function and the density function of this surplus. We show that explicit solutions for these functions can be found when we know the probability and severity of ruin, denoted $G(u, y)$. We also derive an algorithm which can be used to give approximate values of the distribution function when explicit solutions cannot be found. We also briefly consider the joint density of the surplus immediately prior to ruin and the deficit at the time of ruin. *Insurance: Mathematics and Economics*, October 1992, 11(3): 191-207. (Reprinted with permission of North-Holland Publishing Company.)

The Probability and Severity of Ruin in Finite and Infinite Time, by David C. M. Dickson and Howard R. Waters (Heriot-Watt University, Edinburgh, UK)

In this paper we present algorithms to calculate the probability and severity of ruin in both finite and infinite time for a discrete time risk model. We show how the algorithms can be applied to give approximate values for the same quantities in the classical continuous time risk model. *Astin Bulletin*, November 1992, 22(2): 177-190. (Reprinted with permission of the *Astin Bulletin*.)