PROBABILITY THEORY

Comparing the Calibration and Coherence of Numerical and Verbal Probability Judgments, by Thomas S. Wallsten (University of North Carolina), David V. Budescu (University of Illinois-Champaign), and Rami Zwick (The Pennsylvania State University)

Despite the common reliance on numerical probability estimates in decision research and decision analysis, there is considerable interest in the use of verbal probability expressions to communicate opinion. A method is proposed for obtaining and quantitatively evaluating verbal judgments in which each analyst uses a limited vocabulary that he or she has individually selected and scaled. An experiment compared this method to standard numerical responding under three different payoff conditions. Response mode and payoff never interacted. Probability scores and their components were virtually identical for the two response modes and for all conditions. The two response modes differed in that the central response category was used more frequently in the numerical than the verbal case, while overconfidence was greater verbally than numerically. Response distributions and degrees of overconfidence were also affected by payoffs. Practical and theoretical implications are discussed. *Management Science,* February 1993, 39(2): 176-190. (Reprinted with permission of *Management Science.*)

Nonparametric Tests for Mixed Poisson Distributions, by Jacques Carriere (The University of Manitoba, Winnipeg, Canada)

Consider a portfolio of insurance policies where the mean frequency of claims for each policy may vary. This heterogeneity of risk in the portfolio may be modeled as a distribution function $F(\lambda)$ on the mean frequency λ. This paper will present nonparametric tests of hypothesis about $F(\lambda)$, given the observed claim frequencies N_i for i=1,...,T from a portfolio with T policies. Throughout the discussion we will assume that N_i has a mixed Poisson distribution with a mixing distribution $F(\lambda)$ that are estimable and it will also present nonparametric estimators of these parameters. The paper will also present some tests for the assumption that N_i has a mixed Poisson distribution. *Insurance: Mathematics and Economics,* February 1993, 12(1): 3-8. (Reprinted with permission of North-Holland Publishing Company.)

The Transformed Rejection Method for Generating Poisson Random Variables, by W. Hörmann (University of Economics and Business Administration, Vienna, Austria)

The transformed rejection method, a combination of the inversion and the rejection method, which is used to generate non-uniform random numbers from a variety of continuous distributions, can be applied to discrete distributions as well. For the Poisson distribution a short and simple algorithm is obtained which is well suited for large values of the Poisson parameter μ, even when μ

may vary from call to call. The average number of uniform deviates required is lower than for any of the known uniformly fast algorithms. Timings for a C implementation show that the algorithm needs only half of the code but is—for μ not too small—at least as fast as the current state-of-the-art algorithms. *Insurance: Mathematics and Economics,* February 1993, 12(1): 39-45. (Reprinted with permission of North-Holland Publishing Company.)

A Stochastic Interest Model with an Application to Insurance, by Hans M. Dietz (Humboldt-Universität, Berlin)

The paper presents a general model for valuating a (random) cash-flow subject to (random) interest payments in a semimartingale setting. In particular, the current value of an initial unit capital is expressed by means of the Doléans exponential of the underlying interest process. The results are discussed in a stochastic process model proposed for (one-claim) insurance contracts. *Insurance: Mathematics and Economics,* December 1992, 11(4): 301-310. (Reprinted with permission of North-Holland Publishing Company.)

RUIN THEORY

The Probability of Ruin for the Inverse Gaussian and Related Processes, by F. Dufresne (Laval University, Quebec, Canada) and H. U. Gerber (University of Lausanne, Switzerland)

We consider a family of aggregate claims processes that contains the gamma process, the Inverse Gaussian process, and the compound Poisson process with gamma or degenerate claim amount distribution as special cases. This is a one-parameter family of stochastic processes. It is shown how the probability of ruin can be calculated for this family. Extensive numerical results are given and the role of the parameter is discussed. *Insurance: Mathematics and Economics,* February 1993, 12(1): 9-22. (Reprinted with permission of North-Holland Publishing Company.)

HEALTH CARE AND INSURANCE

Utilization Control in HMOs, by Larry Debrock and Richard J. Arnould (University of Illinois at Urbana-Champaign)

Health Maintenance Organizations (HMOs) have emerged as a major vehicle to reduce transaction costs associated with defining the limits of health insurance coverage and to provide appropriate provider incentives. This article explains the heterogeneous set of incentives used by HMOs to reimburse providers and performs empirical tests of their effectiveness. The empirical analyses reveal that utilization of health care services is reduced when (1) physician compensation is based on salary or capitation arrangements rather