

VOLUME XC

NUMBERS 172 AND 173

PROCEEDINGS

OF THE

Casualty Actuarial Society

ORGANIZED 1914



2003

VOLUME XC

Number 172—May 2003

Number 173—November 2003

COPYRIGHT—2004
CASUALTY ACTUARIAL SOCIETY
ALL RIGHTS RESERVED

Library of Congress Catalog No. HG9956.C3
ISSN 0893-2980

Printed for the Society by
United Book Press
Baltimore, Maryland

Typesetting Services by
Minnesota Technical Typography, Inc.
St. Paul, Minnesota

FOREWORD

Actuarial science originated in England in 1792 in the early days of life insurance. Because of the technical nature of the business, the first actuaries were mathematicians. Eventually, their numerical growth resulted in the formation of the Institute of Actuaries in England in 1848. Eight years later, in Scotland, the Faculty of Actuaries was formed. In the United States, the Actuarial Society of America was formed in 1889 and the American Institute of Actuaries in 1909. These two American organizations merged in 1949 to become the Society of Actuaries.

In the early years of the 20th century in the United States, problems requiring actuarial treatment were emerging in sickness, disability, and casualty insurance—particularly in workers compensation, which was introduced in 1911. The differences between the new problems and those of traditional life insurance led to the organization of the Casualty Actuarial and Statistical Society of America in 1914. Dr. I.M. Rubinow, who was responsible for the Society's formation, became its first president. At the time of its formation, the Casualty Actuarial and Statistical Society of America had 97 charter members of the grade of Fellow. The Society adopted its present name, the Casualty Actuarial Society, on May 14, 1921.

The purposes of the Society are to advance the body of knowledge of actuarial science applied to property, casualty, and similar risk exposures, to establish and maintain standards of qualification for membership, to promote and maintain high standards of conduct and competence for the members, and to increase the awareness of actuarial science. The Society's activities in support of this purpose include communication with those affected by insurance, presentation and discussion of papers, attendance at seminars and workshops, collection of a library, research, and other means.

Since the problems of workers compensation were the most urgent at the time of the Society's formation, many of the Society's original members played a leading part in developing the scientific basis for that line of insurance. From the beginning, however, the Society has grown constantly, not only in membership, but also in range of interest and in scientific and related contributions to all lines of insurance other than life, including automobile, liability other than automobile, fire, homeowners, commercial multiple peril, and others. These contributions are found principally in original papers prepared by members of the Society and published annually in the *Proceedings of the Casualty Actuarial Society*. The presidential addresses, also published in the *Proceedings*, have called attention to the most pressing actuarial problems, some of them still unsolved, that the industry has faced over the years.

The membership of the Society includes actuaries employed by insurance companies, industry advisory organizations, national brokers, accounting firms, educational institutions, state insurance departments, and the federal government. It also includes independent consultants. The Society has three classes of members—Fellows, Associates, and Affiliates. Both Fellows and Associates require successful completion of examinations, held in the spring and fall of each year in various cities of the United States, Canada, Bermuda, and selected overseas sites. In addition, Associateship requires completion of the CAS Course on Professionalism. Affiliates are qualified actuaries who practice in the general insurance field and wish to be active in the CAS but do not meet the qualifications to become a Fellow or an Associate.

The publications of the Society and their respective prices are listed in the Society's Yearbook. The Syllabus of Examinations outlines the course of study recommended for the examinations. Both the Yearbook, at a charge of \$40 (U.S. funds), and the Syllabus of Examinations, without charge, may be obtained from the Casualty Actuarial Society, 1100 North Glebe Road, Suite 600, Arlington, Virginia 22201.

JANUARY 1, 2003
EXECUTIVE COUNCIL*

GAIL M. ROSS	<i>President</i>
MARY FRANCES MILLER	<i>President-Elect</i>
SHELDON ROSENBERG	<i>Vice President-Administration</i>
THOMAS G. MYERS	<i>Vice President-Admissions</i>
JOHN C. NARVELL	<i>Vice President-International</i>
ROGER A. SCHULTZ	<i>Vice President-Marketing & Communications</i>
CHRISTOPHER S. CARLSON	<i>Vice President-Professional Education</i>
DONALD F. MANGO	<i>Vice President-Research & Development</i>

THE BOARD OF DIRECTORS

*Officers**

GAIL M. ROSS	<i>President</i>
MARY FRANCES MILLER	<i>President-Elect</i>

Immediate Past President†

ROBERT F. CONGER	2003
------------------	------

Elected Directors†

RALPH S. BLANCHARD III	2003
JANET L. FAGAN	2003
MICHAEL J. MILLER	2003
DEBORAH M. ROSENBERG	2003
PHILLIP N. BEN-ZVI	2004
CURTIS GARY DEAN	2004
DAVID G. HARTMAN	2004
JANET R. NELSON	2004
GARY R. JOSEPHSON	2005
DAVID J. OAKDEN	2005
PATRICIA A. TEUFEL	2005
OAKLEY E. VAN SLYKE	2005

*Term expires at the 2003 Annual Meeting. All members of the Executive Council are Officers. The Vice President-Administration also serves as the Secretary and Treasurer.

† Term expires at the Annual Meeting of year given.

**2003 PROCEEDINGS
CONTENTS OF VOLUME XC**

	Page
PAPERS PRESENTED AT THE 2003 CAS SPRING MEETING	
Source of Earnings Analysis for Property-Casualty Insurers	
Sholom Feldblum	1
Distribution-Based Pricing Formulas Are Not Arbitrage-Free	
David L. Ruhm	97
ADDRESS TO NEW MEMBERS—MAY 19, 2003	
Albert J. Beer	130
MINUTES OF THE 2003 CAS SPRING MEETING	135
PAPERS PRESENTED AT THE 2003 CAS ANNUAL MEETING	
The Stanard-Bühlmann Reserving Procedure: A Practitioner’s Guide	
Sholom Feldblum	155
The Minimum Bias Procedure: A Practitioner’s Guide	
Sholom Feldblum and J. Eric Brosius	196
Insurance Applications of Bivariate Distributions	
David L. Homer and David R. Clark	274
DISCUSSION OF A PAPER PUBLISHED IN VOLUME LXXXIX	
Testing The Reasonableness of Loss Reserves: Reserve Ratios	
C. K. “Stan” Khury	
Discussion by Charles A. Bryan	308
ADDRESS TO NEW MEMBERS—NOVEMBER 10, 2003	
C. K. “Stan” Khury	317
PRESIDENTIAL ADDRESS—NOVEMBER 10, 2003	
Gail M. Ross	321
MINUTES OF THE 2003 CAS ANNUAL MEETING	331

**2003 PROCEEDINGS
CONTENTS OF VOLUME XC**

	Page
REPORT OF THE VICE PRESIDENT—ADMINISTRATION	
Sheldon Rosenberg	360
FINANCIAL REPORT	369
2003 EXAMINATIONS-SUCCESSFUL CANDIDATES	370
OBITUARIES	
Clyde Birch Fulton Jr.	395
James Bronson Gardiner	397
Ward Van Buren Hart Jr.	399
Gary Paul Hobart	400
David Jon Kretsch	402
Matthew H. McConnell Jr.	403
Jack Moseley	404
Robert F. Roach	406
William J. Rowland	407
Cindy Rae Schauer	409
James Surrago	411
INDEX TO VOLUME XC	413

NOTICE

Papers submitted to the *Proceedings* of the Casualty Actuarial Society are subject to review by the members of the Committee on Review of Papers and, where appropriate, additional individuals with expertise in the relevant topics. In order to qualify for publication, a paper must be relevant to casualty actuarial science, include original research ideas and/or techniques, or have special educational value, and must not have been previously copyrighted or published or be concurrently considered for publication elsewhere. Specific instructions for preparation and submission of papers are included in the *Yearbook* of the Casualty Actuarial Society.

The Society is not responsible for statements of opinion expressed in the articles, criticisms, and discussions published in these *Proceedings*.

Editorial Committee, *Proceedings* Editors

JAMES F. GOLZ, *Editor In Chief*

NATHAN J. BABCOCK

JEANETTE R. COSTELLO

DANIEL A. CRIFO

DALE R. EDLEFSON

KEITH D. HOLLER

ALI ISHAQ

LINDA SNOOK

GLENN WALKER