JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS

December 1971

A SPECIAL ISSUE DEVOTED TO PORTFOLIO THEORY AND CAPITAL MARKETS

JOHN LINTNER
The Effect of Short Selling and Margin Requirements in Perfect Capital Markets

M. J. BRENNAN
Capital Market Equilibrium with Divergent Borrowing and Lending Rates

PAO L. CHENG
Efficient Portfolio Selections Beyond the Markowitz Frontier

GUY G. V. STEVENS
Two Problems in Portfolio Analysis: Conditional and Multiplicative Random Variables

GEORGE M. FRANKFURTER, HERBERT E. PHILLIPS, and JOHN P. SEAGLE Portfolio Selection: The Effects of Uncertain Means, Variances, and Covariances

WILLIAM F. SHARPE A Linear Programming Approximation for the General Portfolio Analysis Problem

ROBERT H. LITZENBERGER and A. P. BUDD A Note on Geometric Mean Portfolio Selection and the Market Prices of Equities

ROBERT A. HAUGEN and CHARLES O. KRONCHE Rate Regulation and the Cost of Capital in the Insurance Industry

JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS

A JOINT PUBLICATION
OF THE
WESTERN FINANCE ASSOCIATION
AND THE
GRADUATE SCHOOL OF BUSINESS ADMINISTRATION
UNIVERSITY OF WASHINGTON
SEATTLE, WASHINGTON 98195

EDITORIAL STAFF

Charles W. Haley, Managing Editor Nancy L. Jacob, Associate Managing Editor Lynn Lewicki, Editorial Assistant

BOARD OF EDITORS

Charles W. Haley, Washington Fred P. Morrisey, UC, Berkeley Edward W. Reed, U.S. National Bank of Oregon Ezra Solomon, Stanford J. Fred Weston, UCLA

ASSOCIATE EDITORS

Richard H. Bernhard, North Carolina State
Marshall E. Blume, Pennsylvania
Charles P. Bonini, Stanford
Richard S. Bower, Dartmouth
William Breen, Northwestern
Myles Delano, Michigan State
Thomas R. Dyckman, Cornell
Robert C. Goshay, UC, Berkeley
Nils H. Hakansson, UC, Berkeley
Robert S. Hamada, Chicago
Frederick S. Hammer, Integrated Systems
Mark Hanna, Georgia
Frank C. Jen, SUNY, Buffalo
Michael C. Jensen, Rochester
Henry A. Latané, North Carolina

John G. McDonald, Stanford
Jacob B. Michaelsen, UC, Santa Cruz
Stewart C. Myers, MIT
Alfred N. Page, Washington
Richard Roll, Carnegie-Mellon
R. Haney Scott, Washington
William F. Sharpe, Stanford
Keith V. Smith, UC, Los Angeles
Roger B. Upson, Minnesota
James Van Horne, Stanford
George von Furstenberg, Indiana
Paul Wells, Illinois
Richard R. West, Cornell
Robert L. Winkler, Indiana

WESTERN FINANCE ASSOCIATION

Executive Committee

W. Scott Bauman, President
David K. Eiteman, Vice President
Thomas E. Stitzel, Secretary-Treasurer
Charles W. Haley, Editor
Harold W. Stevenson
Leslie P. Anderson
Richard V. Cotter
James C. T. Mao
David H. Pyle

University of Oregon
University of California, Los Angeles
Oregon State University
University of Washington
Arizona State University
Colorado State University
University of Nevada
University of British Columbia
University of California, Berkeley

INSTITUTIONAL MEMBERS

Southern California Edison Company Weeden and Company, Inc. Mountain States Telephone Company

Copyright 1971 by the Graduate School of Business Administration, University of Washington.

The Journal of Financial and Quantitative Analysis is published in January, March, June, September, and December by the Graduate School of Business Administration, University of Washington, Seattle, Washington 98195, in conjunction with the Western Finance Association. Second-class postage paid at Seattle, Washington.

The December issue is a special issue devoted to one topic of interest to the JFQA's readership. The March issue contains selected papers, abstracts of papers, discussants' comments, and the Proceedings of the Western Finance Association meetings.

The views and opinions expressed are those of the authors and do not necessarily reflect those of the Graduate School of Business Administration of the University of Washington nor of the Western Finance Association.

For individuals, the annual subscription rate to the JFQA is \$10.00; for firms or libraries, the annual rate is \$15.00. Single copies are \$2.50, except the special issues, the price of which is \$3.00. Annual subscription rates for individuals and libraries outside the United States (except Canada) are \$11.00 for individuals and \$16.00 for libraries. The fiscal year of the Journal of Financial and Quantitative Analysis begins on January 1. All subscriptions received prior to October 1 of any fiscal publication year will receive the entire set of journals published in that year. All subscriptions received on or after October 1 will apply to the forthcoming fiscal publication year.

Manuscripts and editorial correspondence should be sent to the Managing Editor Advertising inquiries and books for review should be addressed to the Associate Managing Editor. Correspondence dealing with subscriptions and billing should be addressed: Subscription Manager, *JFQA*, Mackenzie Hall DJ-10, University of Washington, Seattle, Washington 98195. Claims for missing issues must be made within two months of the scheduled publication month.

Correspondence pertaining to the Western Finance Association should be sent to Professor Thomas E. Stitzel, School of Business, Oregon State University, Corvallis, Oregon 97331.

JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS

Volume VI, Number 5, December 1971

The Effect of Short Selling and Margin Requirements in Perfect Capital Markets	 1173
Capital Market Equilibrium with Divergent Borrowing and Lending Rates	 1197
Efficient Portfolio Selections beyond the Markowitz Frontier Pao $\it L.$ Cheng	 1207
Two Problems in Portfolio Analysis: Conditional and Multiplicative Random Variables	 1235
Portfolio Selection: The Effects of Uncertain Means, Variances, and Covariances	 1251
A Linear Programming Approximation for the General Portfolio Analysis Problem	 1263
A Note on Geometric Mean Portfolio Selection and the Market Prices of Equities	 1277
Rate Regulation and the Cost of Capital in the Insurance Industry Robert A. Haugen and Charles O. Kroncke	 1283
Announcement	1307

Journal of Financial and Quantitative Analysis

Statement of Ownership, Management, and Circulation

Title of Publication: Journal of Financial and Quantitative Analysis

Frequency of Issue: Five times per year (January, March, June, September,

December)

Location of Office

of Publication: Mackenzie Hall, University of Washington, Seattle,

Washington 98195

Location of General

Business Office:

Mackenzie Hall, University of Washington, Seattle,

Washington 98195

Publisher:

Graduate School of Business Administration, University of

Washington

Editor:

Charles W. Haley

Extent and Nature of Circulation:	Average Number of Copies Each Issue (preceding 12 months)	Actual Number of Copies, September 1971 Issue		
Total Number of Copies Printed	1660	1800		
Paid Circulation:				
Sales through dealers and				
carriers, street vendors,				
and counter sales	0	0		
Mail subscriptions	1300	1280		
Total Paid Circulation	1300	1280		
Free Distribution by Mail or Other Means:				
Samples, complimentary, and oth	er			
free copies	200	304		
Copies distributed to news agen	ts			
but not sold	0	0		
Total Distribution	1500	1584		
Office Use, Leftover, Unaccounted	160*	216*		
Total	1660	1800		

^{*}Most of these are later sold by mail order.

Signature of Editor Charles W. Haley

Charles W. Haley