

**AN EMPIRICAL INVESTIGATION
OF STOCK MARKETS**
The CCF Approach

Research Monographs in Japan-U.S. Business & Economics

series editors

Ryuzo Sato

Rama V. Ramachandran

Stern School of Business

New York University

Kazuo Mino

Kobe University

Japan

Other books published in the series:

Sato and Ramachandran

Conservation Laws and Symmetry: Applications to Economics and Finance

Sato, Ramachandran, and Hori

Organization, Performance, and Equity: Perspectives on the Japanese Economy

Sato, Grivoyannis, Byrne, and Lian

Health Care Systems in Japan and the United States: A Simulation Study and Policy Analysis

Sato and Ramachandran

Symmetry and Economic Invariance: An Introduction

Sato, Ramachandran, and Mino

Global Competition and Integration

Negishi

Developments of International Trade Theory

Ihori and Sato

Government Deficit and Fiscal Reform in Japan

AN EMPIRICAL INVESTIGATION OF STOCK MARKETS

The CCF Approach

Shigeyuki Hamori
Kobe University, Japan



SPRINGER SCIENCE+BUSINESS MEDIA, LLC

Hamori, Shigeyuki, 1959-

An empirical investigation of stock markets:the CCF approach/Shigeyuki Hamori
p.cm.—(Research monographs in Japan-U.S. business & economics)

Includes bibliographical references and index.

ISBN 978-1-4613-4838-2 ISBN 978-1-4419-9208-6 (eBook)

DOI 10.1007/978-1-4419-9208-6

1. Stock exchanges—Statistics. I. Title. II. Series.

HG4551.H313 2003

332.64'2'021—dc22

Copyright © 2003 Springer Science+Business Media New York

Originally published by Kluwer Academic Publisher in 2003

Softcover reprint of the hardcover 1st edition 2003

All rights reserved. No part of this work may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise, without the written permission from the Publisher, with the exception of any material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work.

Permission for books published in Europe: permissions@wkap.nl

Permissions for books published in the United States of America: permissions@wkap.com

Printed on acid-free paper.

**To Hitoshi, Makoto
and Naoko**

Contents

List of Figures	ix
List of Tables	xi
Acknowledgments	xv
1. INTRODUCTION	1
2. STOCK PRICES ACROSS INTERNATIONAL MARKETS: A TRADITIONAL APPROACH	7
1 Introduction	7
2 Selected Literature Review	8
3 Data	12
4 Empirical Technique: VAR	13
5 Empirical Technique: LA-VAR	23
6 Conclusion	26
3. STOCK PRICES ACROSS INTERNATIONAL MARKETS: THE CCF APPROACH	31
1 Introduction	31
2 Empirical Technique	33
2.1 ARCH-type Models	33
2.2 Cheung-Ng Test	38
3 Data	41
4 Empirical Results	41
4.1 AR-EGARCH Model	41
4.2 Cheung-Ng Test	44
5 Conclusion	56

4. STOCK PRICES AND EFFECTIVE EXCHANGE RATES	61
1 Introduction	61
2 Selected Literature Review	62
3 Data	65
4 Empirical Results	68
4.1 AR-EGARCH Model	68
4.2 Cheung-Ng Test	72
5 Conclusion	77
5. STOCK PRICES, EFFECTIVE EXCHANGE RATES, AND REAL ECONOMIC ACTIVITIES	83
1 Introduction	83
2 Selected Literature Review	84
3 Data	89
4 Empirical Technique	93
5 Empirical Results	94
5.1 Results for Germany	94
5.2 Results for Japan	99
5.3 Results for the UK	104
5.4 Results for the USA	108
6 Conclusion	113
6. SUMMARY AND FUTURE RESEARCH DIRECTIONS	121
1 Summary	121
2 Future Research Directions	123
REFERENCES	125
INDEX	131

List of Figures

2.1	Logarithmic Stock Price Index: Germany	16
2.2	Logarithmic Stock Price Index: Japan	16
2.3	Logarithmic Stock Price Index: UK	17
2.4	Logarithmic Stock Price Index: USA	17
2.5	First Difference of the Logarithmic Stock Price Index: Germany	18
2.6	First Difference of the Logarithmic Stock Price Index: Japan	18
2.7	First Difference of the Logarithmic Stock Price Index: UK	19
2.8	First Difference of the Logarithmic Stock Price Index: USA	19
2.9	Summary of Causality Test	27
3.1	Two-Step Procedure	39
3.2	Standardized Residuals: Germany	45
3.3	Standardized Residuals: Japan	45
3.4	Standardized Residuals: UK	46
3.5	Standardized Residuals: USA	46
3.6	Squares of Standardized Residuals: Germany	47
3.7	Squares of Standardized Residuals: Japan	47
3.8	Squares of Standardized Residuals: UK	48
3.9	Squares of Standardized Residuals: USA	48
3.10	Summary of Causality in Mean	57
3.11	Summary of Causality in Variance	57
4.1	Summary of Causality: Germany	78

4.2	Summary of Causality: Japan	78
4.3	Summary of Causality: UK	79
4.4	Summary of Causality: USA	79
5.1	Forward-Looking Behavior	84
5.2	Summary of Causality between RSP and IP: Germany	114
5.3	Summary of Causality between REER and IP: Germany	114
5.4	Summary of Causality between RSP and IP: Japan	115
5.5	Summary of Causality between REER and IP: Japan	115
5.6	Summary of Causality between RSP and IP: UK	116
5.7	Summary of Causality between REER and IP: UK	116
5.8	Summary of Causality between RSP and IP: USA	117
5.9	Summary of Causality between REER and IP: USA	117

List of Tables

1.1	Characteristics of the CCF Approach	2
1.2	Relation of Each Chapter	3
2.1	Summary of Literature	9
2.2	Summary Statistics	13
2.3	Unit Root Test	15
2.4	SBIC	21
2.5	Diagnostics	21
2.6	Cointegration Test	22
2.7	Causality Test: VAR	23
2.8	Causality Test: LA-VAR	24
3.1	ARCH-type Models	37
3.2	Characteristics of the EGARCH Model	37
3.3	Empirical results of the AR-EGARCH model	43
3.4	Sample Cross-Correlation of Standardized Residuals: Germany and Japan	49
3.5	Sample Cross-Correlation of Standardized Residuals: Germany and UK	50
3.6	Sample Cross-Correlation of Standardized Residuals: Germany and USA	51
3.7	Sample Cross-Correlation of Standardized Residuals: Japan and UK	52
3.8	Sample Cross-Correlation of Standardized Residuals: Japan and USA	53
3.9	Sample Cross-Correlation of Standardized Residuals: UK and USA	54

4.1	Summary of Literature	63
4.2	Summary Statistics	65
4.3	Unit Root Test	66
4.4	Empirical results of the AR-EGARCH model for foreign exchange rates	69
4.5	Empirical results of the AR-EGARCH model for stock prices	70
4.6	Sample Cross-Correlation of Standardized Residuals: Germany	73
4.7	Sample Cross-Correlation of Standardized Residuals: Japan	74
4.8	Sample Cross-Correlation of Standardized Residuals: UK	75
4.9	Sample Cross-Correlation of Standardized Residuals: USA	76
4.10	Feedback between the Stock Market and the Foreign Exchange Market	81
5.1	Summary of Literature	85
5.2	Summary Statistics	90
5.3	Unit Root Test	91
5.4	Empirical results of the AR-EGARCH model: Germany	95
5.5	Sample Cross-Correlation of Standardized Residuals: industrial production and real stock prices: Germany	96
5.6	Sample Cross-Correlation of Standardized Residuals: industrial production and real effective exchange rate: Germany	97
5.7	Empirical results of the AR-EGARCH model: Japan	100
5.8	Sample Cross-Correlation of Standardized Residuals: industrial production and real stock prices: Japan	101
5.9	Sample Cross-Correlation of Standardized Residuals: industrial production and real effective exchange rate: Japan	102
5.10	Empirical results of the AR-EGARCH model: UK	105
5.11	Sample Cross-Correlation of Standardized Residuals: industrial production and real stock prices: UK	106

5.12	Sample Cross-Correlation of Standardized Residuals: industrial production and real effective exchange rate: UK	107
5.13	Empirical results of the AR-EGARCH model: USA	109
5.14	Sample Cross-Correlation of Standardized Residuals: industrial production and real stock prices: USA	110
5.15	Sample Cross-Correlation of Standardized Residuals: industrial production and real effective exchange rate: USA	111

Acknowledgments

I have benefited greatly from the support of many people in writing this volume. Special thanks are due to Ryuzo Sato, Rama V. Ramachandran, and Kazuo Mino for their kindness in giving me the opportunity to publish this monograph. I would like to thank Koichi Hamada, Kazuhiro Ohtani, Mitoshi Yamaguchi, David A. Anderson and Ramaprasad Bhar for their many helpful comments and suggestions for my research. Robert Parry, Mariyo Takeuchi and an anonymous referee kindly read an early version of this volume and gave me helpful suggestions. Finally, I would like to thank my family members Hitoshi, Makoto and Naoko. Without their warm-hearted support I could not have finished writing this volume and I would like to dedicate this monograph to them. This publication is supported by a Grant-in-aid from the Rokkodai Foundation.

About the Author

Dr. Shigeyuki Hamori is a Professor in the Graduate School of Economics at Kobe University in Japan. He received a Ph.D. from Duke University in 1991, and has published about 40 papers in refereed journals. He also received the Highest Quality Rating in 1998 and 1999, and the Murao Award for Young Researchers in 2002.