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AT VANDERBILT

FINANCIAL MARKETS

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FINANCIAL MARKETS RESEARCH CENTER • 1996

Conference on

Investing Internationally

The growth of economies and financial markets outside the United States continues to present U.S. financial institutions with opportunities and challenges. U.S. markets, such as the New York Stock Exchange and the Chicago Mercantile Exchange, seek efficient ways to make international investing available to their customers. U.S. money managers seek investment opportunities with high return and low risk. U.S. regulators seek to adapt regulations to the new regime of global investing. While the recent strength of the U.S. economy and the tremendous returns in the U.S. stock market have drawn attention away from global investing, few doubt that U.S. investors will greatly increase their holdings of foreign securities over the coming years.

Pre-conference gathering: (l-r) Hans Stoll, Bob Davis, Rick Kilcollin, Jim Cochrane, Duke Chapman, and Dewey Daane

In order to examine some of these issues, the Financial Markets Research Center sponsored a conference on Investing Internationally on April 11 and 12, 1996 at the Owen Graduate School of Management, Vanderbilt University. The conference was funded by the Financial Markets Research Center with the help of a special grant from the New York Stock Exchange, a Center member.

The conference began with a session on Risk, Return and International Investment Strategy, chaired by Rick Kilcollin, executive vice-president of the Chicago Mercantile Exchange. Aris Protopapadakis, professor of finance at the University of Southern California, reported on the results of a study, "The Information Content of the BE/ME Ratio for Pricing Equities Internationally: Evidence from Seven National Markets," which found that the ratio of book value to market value of a stock reliably predicts differences in expected returns across stocks for seven countries. The evidence obtained by Protopapadakis and his co-author, Neal Maroney of the Claremont Graduate School, is based on individual stock data for Australia, Canada, Germany, France, U.K., Japan, and U.S.. The results suggest that since the well-known but controversial book value to market value effect is not confined to U.S. stocks, it is unlikely to be a manifestation of data snooping. The next speaker was Yasushi Hamao, an associate professor of finance at the Columbia Business School, who spoke on the effect of foreign investors on the Japanese stock market. His paper, "Living with the Enemy: An Analysis of Foreign Investment in the Japanese Equity Market," (written with Jianping Mei) examined whether foreign investment is associated with increased market volatility and whether foreign investors are superior market timers and short-term traders. The paper concludes that foreign investors do not have these adverse effects: in fact, foreign investors tend to increase liquidity

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FROM THE DIRECTOR

The objective of the Financial Markets Research Center, founded in 1987, has been to guide and support research in financial markets and to provide a mechanism for interaction among practitioners, academics, and regulators. With funding from its members and from grants, the Center supports research that is intended for publication in scholarly journals. As the Center enters its 10th year, we can look back with pride on its past accomplishments and on the growth in its reputation and impact. Center faculty have contributed importantly to academic research but have also had an impact on regulatory policy and business practice.

Hans R. Stoll

The Center was launched nine years ago with the help of six members, four of which - the Chicago Board Options Exchange, the NASD, Refco Group, and Timber Hill - continue as members. Today fourteen members, listed elsewhere in this newsletter, support the Center. We thank them not only for their financial support but also for their advice and intellectual stimulus. We wish to welcome as new Center members State Street Global Advisors, Willis Corroon Group plc, and Equitable Securities Corporation.

Faculty associated with the Center now number 17, of which 11 are new since 1987. This reflects growth of the Owen School faculty in the last nine years and some turnover. Information on faculty associated with the Center is contained later in this newsletter.

In recognition of de facto responsibilities and effective in the coming academic year, Roger Huang, professor of finance, has accepted appointment as Associate Director of the Center. Professor Huang has been actively involved in the Center and will oversee the Center's data and computer programming operations. Ziyong Cai, who has been working as a research associate at the Center, recently received his MBA degree and has taken a position in Phoenix. We wish him well and thank him for his contributions to the work of the Center. Computer programming and data maintenance are currently provided by Christoph Schenzler, who is completing his Ph.D. in the Economics Department, and by Jinrun Gao, who is a Ph.D. student in finance. Pat Scott, administrative assistant for the Center, continues to keep things well organized.

While personnel have changed considerably, there has been consistent growth in the research impact of Center faculty. The Center's faculty have written on derivatives, triple witching hours, volatility, stock market structure, earnings announcement effects, dividend policy, the Nasdaq stock market, and many other topics. The Center's annual conference brings together academics, practitioners, and regulators to discuss recent research and its implications for practice and regulatory policy. Titles of conferences held in the past nine years indicate some of the interests of the Center and its faculty:

- 1988 - **The Stock Market Crash of 1987: What Have We Learned?**
- 1989 - **Dewey Daane Conference on International Financial Policy.**
- 1990 - **Volatility and Market Structure.**
- 1991 - **Securities Markets Transaction Costs.**
- 1992 - **World Trading Markets.**
- 1993 - **Risk Management.**
- 1994 - **Global Risk.**
- 1995 - **Financial Markets Reform.**
- 1996 - **Investing Internationally.**

This year's conference on Investing Internationally, supported by a special grant from the New York Stock Exchange, is described in greater detail elsewhere in the newsletter.

This has been a noteworthy year for Center associate Bill Christie whose paper, "Why Do NASDAQ Market Makers Avoid Odd-Eighth Quotes?," (with Paul Schultz) received first prize as the best paper in the *Journal of Finance* in 1995. It is also a year in which Bill did not receive a teaching award, contrary to his past practice. Instead the awards for best teachers in the MBA and Executive MBA programs went to Center associates Ron Masulis and Roger Huang respectively. Congratulations! ■

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Financial Markets Research Center
401 Twenty-first Avenue South
Nashville, TN 37203
(615) 322-3671

Martin S. Geisel, Dean

Hans R. Stoll, Director,
Financial Markets Research Center

Roger D. Huang, Associate Director,
Financial Markets Research Center

J. Dewey Daane, Senior Advisor,
Financial Markets Research Center

GOALS

The Financial Markets Research Center at Vanderbilt University fosters scholarly research in financial markets, financial instruments, and financial institutions.

FUNDING

The Center is funded by its members and by outside research grants. Funds are used to maintain financial markets data bases and to support the Center's research projects. Members sit on the advisory board, participate in all activities of the Center, receive research reports, and give advice on the activities and research direction of the Center. Research grants for specific projects are sought from various sponsors including foundations, government agencies, trade organizations, and corporations.

Current Center members are:

America's Community Bankers
Bankers Trust Company
Chicago Board Options Exchange
Chicago Mercantile Exchange
Equitable Securities Corporation
Hull Trading Company
J. C. Bradford & Company
National Association of Securities Dealers, Inc.
New York Stock Exchange, Inc.
Refco Group, Ltd.
State Street Global Advisors
Timber Hill Inc.
Van Hedge Fund Advisors, Inc.
Willis Corroon Group plc

Investing Internationally *(continued)*

Conference Organizer, Roger Huang, opening the conference.

in domestic markets and act counter to temporary local trends.

One of the issues in measuring risk and return for any market is that the researcher is able to observe only those markets that have survived. After the morning coffee break, Philippe Jorion, professor of finance at the University of California at Irvine, presented his analysis of this ex-post selection bias in a paper entitled "Re-emerging Markets" (written with William Goetzmann). Jorion and Goetzmann simulate the emergence of markets under the null hypothesis that no market has abnormal returns. They conclude that recently emerged markets tend to have greater bias in mean returns and tend to have less correlation with the world market factor. They warned that "basing investment decisions on the past performance of emerging markets is likely to lead to disappointing results."

Rick Cooper discussing global investment strategy.

The remaining speakers in the morning session provided different perspectives on practical aspects of global investing. Rick Cooper, director of research and portfolio manager at State Street Global Advisors, discussed strategies for active global investment. Jeffrey P. Davis, vice-president and portfolio manager in State Street Global Advisors International Structured Products Group, discussed passive strategies for global investment. He provided evidence on returns in emerging markets and strategies for investing in emerging markets.

Todd Petzel, chief investment officer of The Common Fund, discussed alternative mechanisms for international investing, including derivatives, swaps, and private equity. He noted that the U.S. is likely to have success in establishing organized markets for emerging economies only if those economies are in the same time zone as the U.S. (such as Brazil and Mexico). Cliff Weber of the American Stock Exchange described the newly launched World Equity Benchmark Shares (WEBS). WEBS are issued against 17 different foreign equity indexes structured according to the Morgan Stanley Capital International Index and are traded on the American Stock Exchange. A similar product, "country baskets," has been listed on the New York Stock Exchange under the sponsorship of Deutsche Bank Morgan Grenfell.

The first session after lunch, chaired by Duke Chapman, chairman of the Chicago Board Options Exchange, focused on Investing Internationally in the United States. U.S. investors need never invest in foreign markets if foreign securities are available in U.S. markets. This session examined some of the issues related to this approach to international investing. Stephen R. Foerster, associate professor of finance at the University of Western Ontario, led off the session with a paper on "The Effects of Market Segmentation and Illiquidity on Asset Prices: Evidence from Foreign Stocks Listing in the U.S." (written with Andrew Karolyi). Foerster and Karolyi examine the price effects for 160 stocks from 14 countries around the listing date on U.S. equity markets. They find a positive return around listing and a negative return subsequent to listing. They ascribe the positive return, not to segmentation of international markets, but to increased liquidity and increased investor recognition. Joseph Velli, executive vice-president of the Bank of New York, described the growth in and workings of the American Depositary Receipt market. The role of the bank is to hold foreign shares and act as a transfer agent and registrar for claims on those deposited shares.

Joe Velli describing ADR's.

An important restriction on the listing of foreign shares in U.S. markets is the requirement that they provide accounting information comparable to that provided by U.S. firms. Andrew Alford in a paper entitled "Financial Reporting and Information Asymmetry: An Empirical Analysis of the SEC's Information-Supplying Exemption for Foreign Companies" (written with Jonathan Jones) examines the effect of differential disclosure standards between registered U.S. companies and registered and unregistered non-Canadian foreign companies. Alford and Jones find that the adverse information component of the bid-ask spread is smaller for non-Canadian foreign companies traded in the U.S. than for registered U.S. companies, suggesting that the less complete information of foreign companies has no adverse impact. They caution that this conclusion is quite tentative and that other factors may explain their results.

Paul A. Leder, deputy director of the Office of International Affairs at the Securities and Exchange Commission provided an overview of regulatory policy and international investing. He focused on three areas: foreign investment advisors, foreign brokers, and accounting standards. The SEC does not wish to regulate the entire foreign entity (i.e. investment advisor or broker), but it does feel it needs jurisdiction of the investment advisor subsidiary or broker who handles U.S. customers. On the accounting issues Leder noted that the SEC has tried to reach out to foreign firms and to provide a confidential review of their foreign filing. He also noted the importance of fostering international accounting standards through the International Accounting Standards Committee.

The Thursday session ended with a panel discussion on Developments in the International Listing and Trading of Equity Securities, chaired by Robert Davis of the

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Investing Internationally *(continued)*

American Bankers Association. George Sofianos of the New York Stock Exchange provided an overview of the alternative ways to access foreign stocks from within the United States: open-end foreign funds, closed-end foreign funds, country baskets, equity derivatives, private placements via the rule 144 market, registered and unregistered American Depositary Receipts, and foreign ordinary shares traded on pink sheets within the United States.

John Board from the London School of Economics spoke on recent developments in the London Stock Market. He noted that the London Stock Exchange will shift from a quote-driven market to an order-driven market in the not too distant future. Christina Liu, professor at the National Taiwan University, spoke on the recent liberalization of access to the Taiwan financial markets for foreign investors. This includes an increase in the maximum investment by foreign investors in Taiwan stocks, a broadening of the definition of qualified foreign investment institutions, and provisions to make the use of depositary receipts easier.

The Thursday evening dinner took place at a local restaurant after which some adventuresome souls checked out the Wild Horse Saloon and other Nashville nightspots.

The Friday morning session on Emerging Markets was chaired by William Albrecht, professor of economics at the University of Iowa. Scott Pardee, senior advisor of Yamaichi International America, Inc., led off with a talk on "The Emerging Market Cycle: Does Russia Fit?" He described the all-too-often observed boom and bust cycle of many emerging markets and then turned to recent developments in the Russian financial markets. While there is tremendous uncertainty in Russia, particularly in view of the upcoming election, Pardee noted that there are reasons for long-run optimism. These include the fact that Russia is irreversibly committed to a free-market system, that it is rich in natural resources, that it has an entrepreneurial spirit, and that its productive assets are currently vastly undervalued.

Scott Pardee making a point.

Stijn Claessens, senior financial economist at the World Bank, presented the results of his paper, "Corporate Governance and Equity Prices: Evidence from the Czech and Slovak Republics." The paper examines the Czech and Slovak Republics' mass privatizations which began in January of 1991. Claessens finds that initial voucher prices and secondary market prices of vouchers are higher the more concentrated the ownership of firms, something which suggests that concentrated ownership may reduce agency problems in corporate governance.

After the morning break, Jack Glen of the International Finance Corporation, presented a paper, "International Cross-Listing, Foreign Ownership Restrictions, and Order Flow Migration: Evidence from Mexico," (written with I. Domowitz and A. Madhavan) which analyzes the effect on Mexican stocks traded on the Bolsa Mexicana de Valores when they are listed on U.S. markets. The authors find evidence of increased volatility, decreased liquidity, and reduced bid-ask spread for stocks traded in Mexico. They attribute these results to both market fragmentation and increased competition after listing on U.S. markets.

The Friday morning session ended with a discussion of the Indian stock market. Rajan Govil, who is completing his Ph.D. in Economics at Vanderbilt University, discussed various empirical regularities for the Indian stock market. In his talk, he discussed short-term price overreactions, the price effect of rights offerings, the price effect of the Indian settlement procedures, and the impact of variables such as book-to-market price and earnings price ratios on expected returns in the Indian stock market. Samir C. Arora, vice-president and chief investment officer of Alliance Capital Management (India) Ltd., provided a lively discussion of the Govil empirical results and gave the audience many insights into the practicalities of trading in the Indian stock market. ■

Daane Invitational Tennis Tournament

As usual, the Daane Invitational Doubles Tournament attracted some very good tennis players, who competed strenuously for the contents of the Daane Cup. Since players rotate partners every four games, the best players are not always the victors, but that was not the case this year. No players were more able than winner Dean Furbush and runner-up Jim Lodas. Host Dewey Daane, piqued by his failure to place in his own tournament, proposed a change of rules - chiefly that the tournament host have his choice of partners. ■

Dewey Daane flanked by winner, Dean Furbush, and runner-up, Jim Lodas.

Research Workshops

Workshops conducted at the Owen School throughout the year provide a forum for the exchange and testing of new ideas in areas of current research. During 1995-96 the following researchers presented work on finance topics:

Richard Baillie, *Michigan State University*: "Explaining the Forward Premium Anomaly: Remembering Long Memory"

Mike Barclay, *University of Rochester*: "Bid-Ask Spreads and the Avoidance of Odd-Eighth Quotes on Nasdaq: An Examination of Exchange Listings"

Sanjai Bhagat, *University of Colorado*: "Corporate Performance, Governance, and Discipline: The Impact of Defensive Activity on Takeovers and Managerial Turnover"

George Benston/Bob Wood, *Emory/University of Memphis*: "Of SOES Bandits and Spreads"

Paul Chaney, *Owen School*: "The Use of Accruals in Earnings Management: A Permanent Earnings Hypothesis"

Kathryn Dewenter, *University of Washington*: "Public Offerings of State Owned and Privately Owned Enterprises: An International Comparison"

Peter Easton, *Ohio State University*: "The Over-Reaction Hypothesis: Evidence from the Pre-Formation Period"

Roger Huang/Hans Stoll, *Owen School*: "Dealer Versus Auction Markets: A Paired Comparison of Execution Costs on Nasdaq and the NYSE"

Roger Huang/Martin Weingartner, *Owen School*: "Do Market Makers Suffer from Splitting Headaches?"

Ravi Jagannathan, *University of Minnesota*: "Dividends without Taxes: Empirical Evidence from Hong Kong"

Steve Kamin, *Federal Reserve Board*: "Monetary Policy in the End-Game to Exchange-Rate Based Stabilizations: The Case of Mexico"

Pete Kyle, *Duke University*: "Speculation Duopoly with Agreement to Disagree"

Thomas Lys, *Northwestern University*: "A Closer Look at Post-Earnings Announcement Drift: The Role of Analyst Trade Recommendations"

Ananth Madhaven, *University of Southern California*: "In Search of Liquidity: Block Trades in Upstairs and Downstairs Markets"

David Parsley, *Owen School*: "Convergence to the Law of One Price without Trade Barriers or Currency Fluctuations"

Lakshmanan Shivakumar, *Owen School*: "Estimating Abnormal Accruals for Detection of Earnings Management"

Siegfried Trautmann, *Johannes Gutenberg-Universität Mainz*: "Option Hedging in the Presence of Jump Risk" ■

Guest Speakers

An important aspect of the education of MBA students and the faculty at the Owen School is the opportunity to listen to and question senior executives from financial industries. Outside speakers are sponsored directly by the Financial Markets Research Center, the Owen Lecture Series, or the Finance Association, or are invited as an integral part of courses such as Monetary and Fiscal Policy and Financial Institutions. Guest speakers during the 1995-96 academic year were:

Roger E. Brinner, Group Vice-President and Executive Research Director, *DRI*

J. Alfred Broaddus, Jr., President, *Federal Reserve Bank of Richmond*

Richard Fuld, Jr., President, *Lehman Brothers*

William Hoagland, Majority Staff Director, *Senate Budget Committee*

Tom James, Chairman & CEO, *Raymond James Financial, Inc.*

Donald L. Kohn, Director, Monetary Affairs, *Board of Governors of the Federal Reserve System*

Jack W. Lavery, Senior Vice-President and Director of Corporate and Public Policy Research, *Merrill Lynch*

Eugene A. Leonard, President, *Corporation for Financial Risk Management,* St. Louis

David A. Lereah, Chief Economist and Vice-President, *Mortgage Bankers Association of America*

Thomas C. Melzer, President, *Federal Reserve Bank of St. Louis*

Cathy E. Minehan, President, *Federal Reserve Bank of Boston*

David Mullins, Partner, *Long-Term Capital Management, LP*

Scott E. Pardee, Senior Advisor, *Yamaichi International (America) Inc.*

Rudolph G. Penner, Director of Economic Studies, *KPMG Peat Marwick*

Mary Schapiro, President, *NASD Regulation, Inc.*

Richard L. Scott, President and CEO, *Columbia/HCA Healthcare Corporation*

Janet L. Yellen, Member, *Board of Governors of the Federal Reserve System* ■

Current Activities of Center Faculty

CLIFFORD BALL, Associate Professor (finance and statistics). M.Sc., Ph.D., mathematics (New Mexico, 1980).

Conducts research in options, bond, and futures pricing and statistical applications to finance. Current research topics: pricing interest-rate contingent claims; the European Monetary System; statistical estimation of diffusion processes employed in financial modeling. Prior to joining the Owen School in 1990, Ball was a faculty member at the University of Michigan Business School and the London Business School. He also has served as a consultant with the investment firm of Shearson, Lehman & Hutton. Ball teaches finance and statistics and was a finalist for the James A. Webb Award for Excellence in Teaching.

Ball attended an NBER conference on Capital Requirements and Derivatives in Boston in October 1995 and took part in the Chicago Board of Trade conference in Houston in December. In January, he participated in the annual meetings of the American Finance Association in San Francisco. Ball's recent paper, "Unit Roots and the Estimation of Interest Rate Dynamics," (with Walter Torous) has been accepted for publication in the *Journal of Empirical Finance.* He also serves as a referee for numerous research journals.

PAUL CHANEY, Associate Professor (accounting). M.B.A., Ph.D. (Indiana, 1983), C.P.A., C.M.A.

Conducts research on earnings management and on the economic consequences of accounting information. Chaney was a discussant for the Earnings Management session at the Sixth Annual Conference on Financial Economics and Accounting at the University of Maryland in November. He presented his paper, "Income Smoothing and Firm Characteristics," (with Debra Jeter) at the Southeast American Accounting Association in April.

MYEONG-HYEON CHO, Assistant Professor (economics and strategy). M.B.A. (ESSEC, 1989), M.A., Ph.D. (Cornell, 1992, 1994).

Fields of interest include business strategy, industrial organization, and corporate finance with special emphasis on multinational firms' competitive strategies and their implications for the value of the firm. His current research focuses on issues in corporate restructuring.

Cho teaches courses in the economics of organizations, strategy, and global strategic management.

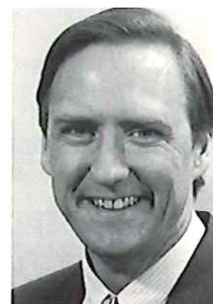
TARUN CHORDIA, Assistant Professor (finance). M.B.A. (Tulane, 1987), Ph.D. (UCLA, 1993).

Research interests include financial institutions, corporate finance, and market microstructure. Chordia teaches investments and financial institutions classes. Prior to his doctoral studies, he worked for Citibank, Bombay as a relationship and credit manager in the Financial Institutions Group.

Chordia's paper, "The Structure of Mutual Fund Charges," appeared as the lead article in Volume 41 of the *Journal of Financial Economics.* His paper, "Measuring Spread Noise in Stock Prices," (with Luke Froeb) was presented at the annual meeting of the Western Economic Association. His paper, "Market Making, the Tick Size and Payment-for-Order-Flow: Theory and Evidence," (with Avanidhar Subrahmanyam) was presented to the Securities and Exchange Commission, received attention in the popular press, and was published in the *Journal of Business.* He helped organize a session on Information Acquisition and Use in Markets at the Financial Management Association meetings.

WILLIAM G. CHRISTIE, Associate Professor (finance). M.B.A., Ph.D. (Chicago, 1980, 1989).

Conducts research in both corporate finance and market microstructure. His current research interests focus on the determination of trading costs in a dealer market and the long run equity performance of firms that privately place debt or equity. Christie's recent publications include "Following the Pied Piper: Do Individual Returns Herd around the Market?" (with Roger Huang), which appeared in the *Financial Analysts Journal,* and "Did Nasdaq Market Makers Implicitly Collude?" (with Paul Schultz), which appeared in the *Journal of Economic Perspectives.* During the past year, Christie has presented his research at the University of North Carolina, the University of Waterloo, the 1996 Federal Reserve Bank of Atlanta Annual Research Conference, and the Fifth Annual Meeting of the Shadow SEC in New York. His paper, "Why Do Nasdaq Market Makers Avoid Odd-Eighth Quotes," (with Paul Schultz) was awarded first prize in the 1995 Smith Breeden competition for outstanding papers published in the *Journal of Finance.* His paper, "Free Cash Flow, Shareholder Value, and the Undistributed Profits Tax of 1936-37," (with Vikram Nanda at the University of Michigan) was also nominated for the Smith Breeden Prize. In conjunction with his work on Nasdaq, he appeared on CNBC's Inside Opinion in November of 1995 and was a guest on NPR's Marketplace Radio in January of 1996.



Christie teaches the core finance course and a second year elective titled "Equity Markets" in the regular MBA program along with the first year finance course in

the Executive MBA program. He was selected as one of two recipients of a Vanderbilt Chair of Teaching Excellence.

MARK A. COHEN, Associate Professor (economics). M.A., Ph.D. (Carnegie-Mellon, 1985).

Conducts research on government regulation, law and economics, white-collar and corporate crime, and environmental management. Before joining the faculty at the Owen School, Cohen was senior economist with the U.S. Sentencing Commission and earlier worked for the Federal Trade Commission, the U.S. Environmental Protection Agency, the U.S. Department of the Treasury, and the U.S. Senate Banking Committee. Cohen's writing has appeared in such publications as the *Journal of Law and Economics* and the *Yale Journal on Regulation.* Cohen recently presented his paper, "Information As Regulation: The Effect of Community Right to Know Laws on Toxic Emissions," (with Shameek Konar) at the annual meetings of the European Association of Environmental and Resource Economists in Lisbon, Portugal. That paper has been accepted for publication in the *Journal of Environmental Economics and Management.* In April, he gave a talk to the Nashville Chapter of the Society of Manufacturing Engineers on "Current and Future Trends in Environmental Management."

Professor Cohen was recently awarded two research grants: (1) National Pollution Prevention Center to prepare a compendium of course material on environmental issues in marketing and (2) W. Alton Jones Foundation, "Does It Pay to be Green? The Relationship Between Environmental and Financial Performance." This grant will fund research that follows up on his previous research on this topic. In January 1996, Professor Cohen was interviewed on this topic for a broadcast of National Public Radio's Environment show.

J. DEWEY DAANE The Frank K. Houston Professor of Finance, Emeritus; Senior Advisor, Financial Markets Research Center. M.P.A., D.P.A. (Harvard, 1949).

Conducts research on monetary economics and international finance. Daane is a former member of the Board of Governors of the Federal Reserve System and is currently a public director and member of the Finance Committee and Special Committee on Disclosure of the National Futures Association. He is also a former public director of the Chicago Board of Trade and served for many years as chairman of the Money Market Committee and vice-chairman of the Trust Board of the Sovran Bank/Central South in Nashville.

In February, March, and May, Daane attended National Futures Association board of directors and finance committee meetings in Chicago and New York. In April, he participated in the annual Financial Markets Research Center conference held at Vanderbilt. In May, he participated in the Federal Reserve Bank of Chicago's 32nd annual conference on Banking Structure and Competition which focused this year on assessing bank regulation and regulatory issues. In June, Daane participated in the Federal Reserve Bank of Boston's 40th annual economic symposium held in Chatham, MA. The conference was on Technology and Growth, searching for answers to the question of why low productivity despite all the advances in technology. In late August, 1996, Daane is scheduled to participate in the Federal Reserve Bank of Kansas City's 20th annual symposium on public policy issues, focusing this year on Achieving Price Stability.

During the spring semester, as part of his Seminar on Monetary and Fiscal Policy, Daane arranged for many of the guest speakers listed elsewhere in this newsletter.

He is currently engaged in writing a history of Equitable Securities Corporation, Nashville, Tennessee.

LUKE M. FROEB, Associate Professor (economics). Ph.D. (Wisconsin, 1983).

Continues his research into computer aided merger simulation and presented a paper on the topic at the American Economic Association meetings in January. He also chaired a session entitled "Mergers."

In January, Froeb's simulation software was used by the U.S. Department of Justice to analyze the potential anticompetitive effects of the L'Oreal/Maybelline cosmetics merger. Based on a small predicted post-merger price rise, the Justice Department let the merger through, which probably would have been blocked using the old methodology based on market shares. The case represented a significant change in policy and created a lot of interest in Froeb's research. Froeb and co-author, Gregory Werden, were the featured speakers at seminars on Post Modern Merger Analysis before the Antitrust Bar in Washington and New York. An article summarizing their research, "Simulation as an Alternative to Structural Merger Policy," was published early this year in *The Economics of the Antitrust Process,* and their work has appeared on the reading lists of several graduate economics programs.

Froeb also continues his research into time series econometrics, writing software and developing frequency domain estimation procedures. An article summarizing his work, "Log Spectral Analysis: Variance Components in Asset Prices," appeared in *Financial and Economic Modeling with Mathematica.*

CHRIS E. HOGAN, Assistant Professor (accounting). M.B.A. (Ohio University, 1990), Ph.D. (Ohio State University, 1994), C.P.A.

Prior to her graduate studies, Hogan worked as an auditor for Price Waterhouse in Columbus, Ohio and then in Chicago. Hogan's research interests include topics in auditing and financial accounting. Her current studies focus on the relation between auditor choice and the pricing of initial public stock offerings and on trends in auditor industry specialization.

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Roger D. Huang Professor (finance). M.A., Ph.D. (Pennsylvania, 1980).

Conducts research on financial markets and international finance. Current research focuses on trading costs, dealer competition in foreign exchange markets, the relation between trading activity and trading volatility, stock splits, and American Depositary Receipts.

During the past year, five of his papers appeared in print. "Competitive Trading of NYSE Listed Stocks: Measurement and Interpretation of Trading Costs" (with Hans R. Stoll) was published in *Financial Markets, Institutions and Instruments*, "Dealer versus Auction Markets: A Paired Comparison of Execution Costs on Nasdaq and the NYSE" (with Hans R. Stoll) was published as a lead article in the *Journal of Financial Economics*, "Energy Shocks and Financial Markets" (with Ronald W. Masulis and Hans R. Stoll) was published as a lead article in the *Journal of Futures Markets*, "Data Frequency and the Number of Factors in Stock Returns" (with Hoje Jo) was published in the *Journal of Banking and Finance*, and "Following the Pied Piper: Do Individual Returns Herd Around the Market?" (with William G. Christie) was published in the *Financial Analysts Journal*. His paper on "Data Frequency and the Number of Factors in Stock Returns" written with Hoje Jo won the 1996 Iddo Sarnat Award given by the *Journal of Banking and Finance* and the European Finance Association.

Huang is a past winner of best teacher awards voted by the Executive MBA and the regular MBA students.

Debra C. Jeter, Assistant Professor (accounting). M.B.A. (Murray State, 1981), Ph.D. (Vanderbilt, 1990).

Conducts research on financial accounting and auditing, with specific interest in income smoothing, components of earnings, the market for audit services, and audit opinions.

Jeter presented "Client-Auditor Realignments and Restrictions on Auditor Solicitation" at the American Accounting Association (AAA) Auditing Conference in January 1996. She presented "Income Smoothing and Firm Characteristics" at the 1996 Southeast AAA Conference in April 1996. Jeter is serving on the AAA's New Faculty Consortium Committee for 1996-97.

Craig M. Lewis, Associate Professor (finance). M.S., Ph.D. (Wisconsin, 1986), C.P.A.

Conducts research on corporate financial policy, accounting earnings informativeness, futures, and options. Current research topics include the time series behavior of volatility, margin policy, convertible debt policy, and earnings forecasting and management.

Subjects of published papers by Lewis include the information content of implied volatilities, volatility forecasting, multiperiod corporate financial policy choices, the valuation of convertible debt, recapitalization, and earnings management. His paper, "Earnings Management and Firm Valuation under Asymmetric Information Content," (with Paul Chaney) was published in the *Journal of Corporate Finance*.

Lewis obtained a research grant from State Street Global Advisors to investigate stock price behavior following forecast revisions by individual security analysts. The study seeks to examine whether particular analysts influence subsequent changes in stock price more than others.

Lewis presented his paper, "The Information Content of Value Line Convertible Rankings," (with R. Rogalski and J. Seward) at the University of Virginia and the University of Utah. The paper, "Margin Adequacy in the Crude Oil Futures Market," (with T. Day) was presented at the University of Illinois. The paper, "Agency Problems, Information Asymmetries, and Convertible Debt Security Design," will be presented at the Financial Management and American Finance Association meetings later this year. Lewis discussed a paper at the American Finance Association conference in January and served as a referee for numerous journals during the past year.

Ronald W. Masulis, The Frank K. Houston Professor of Finance. M.B.A., Ph.D. (Chicago, 1978).

Conducts research in the fields of corporate finance, market microstructure, financial institutions, and international finance. His research on capital structure changes and the security issuance process is widely referenced.

Prior to joining the Owen School in 1990, Masulis taught for many years at UCLA and worked as a financial economist at the Securities and Exchange Commission, the Federal Home Loan Bank Board and the Federal Savings and Loan Insurance Corporation. From 1986 to 1990, he was The James M. Collins Professor of Finance and executive director of the Center for the Study of Financial Institutions and Markets at SMU. Masulis has served on the board of directors of the American Finance Association and the executive committee of the Western Finance Association and is associate editor of a number of well known finance journals, including the Journal of Finance.

Masulis presented his paper, "FX Spreads and Dealer Competition Across the 24 Hour Trading Day," (with Roger D. Huang) at the University of Tennessee in October and at the University of Utah in January. He presented "A Study of Initial Returns to Mutual Thrift Conversions to Stock Charter" at the University of Alabama in April. Masulis served on the program committees for the annual meetings of the Western Finance Association and the European Finance Association in 1996. His study, "Seasoned Equity Offerings: A Survey," (with Espen Eckbo) was published as a chapter in the *Handbook in Operations Research and Management Science: Finance* this past fall, and his paper, "Energy Shocks and Financial Markets," (with Roger Huang and Hans Stoll) was published as the lead article in the February 1996 issue of the

Journal of Futures Markets.

Masulis was selected by the 1996 graduating MBA class to receive the Webb Award for Teaching Excellence. In June, he was a visiting professor at the Norwegian School of Management in Oslo.

DAVID C. PARSLEY, Assistant Professor (economics). A.M. (Indiana, 1979), Ph.D. (California, Berkeley, 1990).

Joined the Owen faculty in 1990 after completing his Ph.D. at the University of California at Berkeley. Prior to his doctoral studies, he worked as a research associate at the Federal Reserve Bank of San Francisco. Current research focuses on whether prices in different locations converge toward parity, at what rate convergence occurs, and what factors influence these rates.

Parsley presented papers on convergence to purchasing power parity at the Western Economics Association meetings in San Diego, the National Bureau of Economic Research Summer Institute in July, the University of South Carolina in November, and the American Economics Association meetings in January. Three papers recently were accepted for publication: "Pricing in Foreign Markets: An Examination of Exchange Rate Pass-Through at the Commodity Level," in the *Review of International Economics*; "Anticipated Future Shocks and Exchange Rate Pass-Through in the Presence of Reputation," in the *International Review of Economics and Finance*; and "Inflation and Relative Price Variability in the Short and Long Run: New Evidence from the United States," forthcoming in the *Journal of Money, Credit and Banking.*

DAVID T. SCHEFFMAN, The Justin Potter Professor of American Competitive Enterprise. Ph.D. (MIT, 1971).

Conducts research on business strategy, marketing, pricing, distribution, regulation, and antitrust. Current research topics include a book on strategy, management, and valuation of intellectual property, the law and economics of punitive damages, the financial economics of the commercial aircraft industry, econometric problems arising from certain forms of data aggregation, and mergers in the electric power industry. He made a presentation on distribution strategy and antitrust to the American Bar Association Antitrust Section annual meetings in March.

Scheffman has published three papers over the last year dealing with antitrust, economics, and marketing. He is also contributing to an American bar Association monograph on interdependent behavior.

HANS R. STOLL, The Anne Marie and Thomas B. Walker Professor of Finance; and Director of the Financial Markets Research Center. M.B.A., Ph.D. (Chicago, 1966).

Has been engaged in research on stock market structure, including the structure of the Nasdaq Stock Market. During the past year Stoll led the discussion on the formulation of a statement on the structure of the Nasdaq Stock Market by the Financial Economists Roundtable, a group of senior financial economists from around the world who develop positions on current policy issues.

Stoll presented his paper, "Dealer versus Auction Markets: A Paired Comparison of Execution Costs on Nasdaq and the NYSE," (with Roger Huang) at the University of Indiana in October and at the annual meeting of the Shadow Securities and Exchange Commission in New York City in November. The paper later appeared in the July 1996 issue of the *Journal of Financial Economics.*

Stoll continues in his role as one of the five Shadow SEC Commissioners and participated in the Shadow SEC's deliberations on the Nasdaq Stock Market. Stoll talked on "Risk Management Issues" at the annual conference of the International Association of Financial Engineers in New York City. He chaired a session on "Empirical Studies in Market Microstructure" at the American Finance Association meetings in San Francisco. Stoll served as moderator of a panel at a New York Stock Exchange conference on Recent Developments in International Equity Markets held in Florida in December, and he also moderated a session at the NYSE conference on the Search for the Best Price, held at the New York Stock Exchange in March 1996. In February and March of 1996, Stoll presented his paper, "The Components of the Bid-Ask Spread: A General Approach," (with R.D. Huang) at Louisiana State University, UCLA, and Arizona State University. Stoll spent a week as a visiting scholar at Arizona State University where he led a Ph.D. seminar as well as presenting his paper. Other publications by Stoll appearing in the last year include "Lost Barings: A Tale in Three Parts Concluding with a Lesson" in the *Journal of Derivatives*; "Competitive Trading of NYSE Listed Stocks: Measurement and Interpretation of Trading Costs" (with R.D. Huang) in *Financial Markets, Institutions, and Instruments*; and "Energy Shocks and Financial Markets" (with Huang and Masulis) in the *Journal of Futures Markets.*

H. MARTIN WEINGARTNER, The Brownlee O. Currey Professor of Finance. M.S., Ph.D. (Carnegie Mellon, 1962).

Specializes in the financial strategy of organizations - particularly entrepreneurial ventures. Weingartner has written extensively on the uses of mathematical models in financial decision making and approaches to capital budgeting and has consulted for major financial institutions and other organizations.

Weingartner teaches courses in negotiation, case studies in finance, financial decision making, and real estate finance. He is a past president of The Institute of Management Sciences and is associate editor of *Management Science.* His publications include *Mathematical Programming and the Analysis of Capital Budgeting Problems* and numerous articles. ■

Faculty Research Papers

Current working papers completed or revised since January 1, 1995 are listed below. Individual copies may be obtained by writing Mrs. Pat Scott, Owen Graduate School of Management, Vanderbilt University, Nashville, TN 37203.

*91-12 "An Analysis of Nonlinearities in Term Premiums and Forward Rates," by **Roger D. Huang and Charles S.Y. Lin.** (October 5, 1995)*

Previous studies often assume a linear relation between term premiums on Treasury securities and forward interest rates even though a nonlinear relation is a theoretical and an empirical possibility. This paper uses a non-parametric kernel approach that permits both linear and nonlinear relations. The linear specification appears to yield conditional expectations of term premiums that are similar to those predicted by the kernel approach only at the mean forward premiums. Generally, kernel estimation shows that the responses of expected term premiums to changes in forward premiums are time-varying and are significantly different from the constant slope coefficients produced by linear estimations. The evidence also shows that forward premiums contain much more information content for predicting future term premiums than has been found with linear estimation procedures.

*91-15 "Income Smoothing and Underperformance in Initial Public Offerings," by **Paul K. Chaney and Craig M. Lewis.** (May 1996)*

This paper investigates how firms that made initial public offerings of equity between 1975 and 1984 report earnings. For a sample of 489 firms, we find a positive association between a proxy for income smoothing and firm performance. That is, firms that perform well tend to report earnings with less variability relative to cash from operations compared to other firms. In addition, the five-year earnings response coefficient is greater for firms that are able to smooth earnings relative to cash flows. This result is consistent with a hypothesis that the market makes better assessments of the information content of earnings for firms with smoother earnings. Finally, we show that IPO firms tend to use discretionary accruals to smooth income relative to the prior year's earnings.

*91-64 "Unit Roots and the Estimation of Interest Rate Dynamics," by **Clifford A. Ball and Walter N. Torous.*** (Forthcoming in *Journal of Empirical Finance*)

This paper investigates the time series estimation of Cox, Ingersoll, and Ross's square-root, mean-reverting specification for interest rate dynamics. For a priori reasonable mean reversion, the corresponding stochastic behavior of interest rates is sufficiently close to a non-stationary process with a unit root so that least squares, the generalized method of moments, as well as maximum likelihood estimation consistently provide upward biased estimates of the model's speed of adjustment coefficient. As a result, corresponding bond yields revert too quickly to their long-term means. These conclusions are robust to assuming multiple state variable specifications, such as Brennan and Schwartz's two factor model of interest rate dynamics. We also document conditions under which the unit root problem persists even if the cross-sectional restrictions of the Cox, Ingersoll, and Ross single factor term structure model are imposed.

*92-32 "Initial Margin Policy and Stochastic Volatility in the Crude Oil Futures Market," by **Theodore E. Day and Craig M. Lewis.** (November 1995)*

This paper examines the relation between the volatility of the crude oil futures market and changes in initial margin requirements. To closely match changes in futures market volatility with the corresponding changes in margin requirements, we infer the volatility of the futures market from the prices of crude oil futures options contracts. The valuation model used to determine the implied volatilities is consistent with the stochastic volatility of the futures market, permitting us to estimate both the spot volatility and the parameters of a mean-reverting diffusion process for volatility. The results show that volatility increases during the ten days prior to increases in margin requirements. However, during the ten days following increases in margin requirements, the observed decline in volatility is not significantly different from the decay that should be expected based on our estimate for the mean-reversion of futures market volatility.

*93-21 "Inflation and Relative Price Variability in the Short and Long Run: New Evidence from the United States," by **David C. Parsley.*** (Forthcoming in *Journal of Money, Credit and Banking*)

This paper presents new evidence that a positive association exists between inflation and relative prices and relative inflation rates in very disaggregated data for the United States over the period 1975 through 1992. There is also evidence that the response of relative prices and relative inflation rates to inflation varies inversely with the information content of a given shock to inflation. The relationship is studied from two cross-sectional perspectives using individual price series collected from forty-eight U.S. cities. Evidence on the persistence of the effects of inflation on relative prices is also presented. Results here demonstrate the absence of a long run relationship between inflation and relative price dispersion, i.e., the two series are not cointegrated. Finally, results from vector autoregressions further imply the effect is smaller than indicated by typical estimates.

*94-05 "Anatomy of Trading Costs: Evidence from the NYSE," by **Roger D. Huang and Hans R. Stoll.** (July 17, 1996)*

This paper measures the revenues per share of immediacy suppliers by a measure we term the "realized half-spread." The estimate, based on the complete record of all transactions for 343 stocks that are continuously listed in the S&P 500 on the New York Stock Exchange during the period 1987 to 1991 is about two to three cents per share. Inferences are made about the revenues of public limit orders as compared with the revenues of securities firms. The earnings of securities firms from their trading activities are shown to be consistent with the measured realized half-spread, and the data imply that limit orders are "picked off." Execution costs of investors are often measured by the quoted or effective half-spread. These measures are calculated from the data and reconciled with the realized spread. Also estimated are the Roll implied spread and a measure termed the perfect foresight spread.

*94-06 "Measuring 'Spread Noise' in Stock Prices," by **Tarun Chordia and Luke M. Froeb.** (July 2, 1996)*

"Spread noise" is the unpredictable part of stock price variance that is due to transactions costs. We develop a methodology for measuring the amount of spread noise in stock prices using a natural experiment that occurred on May 26, 1994. On or near that date, four stocks suddenly began trading at odd eighths, an equivalent tick size change from $1/4 to $1/8. Innovation variances in each of the stocks declined about 50%, and we compute that spread noise at $1/4 tick size accounts for

about 80% of innovation variance; at $1/8 tick size, it accounts for about 50% of innovation variance, a decrease of about 30%.

94-17 "Differential Speeds of Adjustment, Cross-Autocorrelations, and Reaction to Earnings Announcements," by ***Tarun Chordia*** *and* ***Bhaskaran Swaminathan****. (March 27, 1996)*

This paper provides an economic rationale for the cross-autocorrelation patterns in stock returns. Information is incorporated into prices through informed trading and since stocks differ in the amount of informed trading, their prices react differently to common information. It is this difference in the speed of adjustment to common information that gives rise to the cross-autocorrelation patterns. Since trading volume and spreads are related to informed trading, the model predicts that returns of high-trading volume stocks will lead returns of low-trading volume stocks and that returns of narrow bid-ask spread stocks will lead returns of wider bid-ask spread stocks. Empirical evidence is consistent with this prediction. The data suggests that trading volume is a better proxy for the source of differential speeds of adjustment than either size or bid-ask spread. Cross-sectional regressions involving stock price reactions to earnings announcements provide strong support for the speed of adjustment hypothesis and confirm that trading volume is a better proxy of informed trading than size or bid-ask spread.

94-20 "Theories of Punishment and Empirical Trends in Corporate Criminal Sanctions," by ***Mark A. Cohen****.* (Forthcoming in *Managerial and Decision Economics*)

Economists who have studied crime and punishment have long advocated imposing an "optimal penalty" equal to harm divided by the probability of detection. Recent theoretical advances have augmented this theory in the context of corporate crime, by examining the role of individuals within an organization convicted of crime. This revised theory takes into account the principal-agent relationship inherent in the employer-employee contract. This paper reviews optimal penalty theory as it applies to corporate crime, and derives its testable implications. These empirical implications are then tested against a sample of organizations convicted of federal crimes in the U.S. It is shown that current prosecutorial and sentencing practice is consistent with optimal penalty theory to the extent that it calls for (1) increased sanctions with increased harm, and (2) increased individual liability when the organization cannot afford to compensate for the harm imposed. Several other empirical issues are examined, including the penalty for going to trial and the "deep pocket" effect.

94-23 "The Response of Domestic Prices to Nominal Exchange Rate Changes in the Presence of an Active Central Bank: Recent U.S. Experience," by ***David Parsley*** *and* ***Helen Popper****. (April 19, 1995)*

This paper studies the impact of the monetary policy regime on the responsiveness of domestic prices to exchange rate changes. In the presence of an active central bank, inferences about market structure or firm behavior that are drawn from the observed relationship between currency movements and goods' prices can be seriously misleading if the central bank's role is ignored. We study a panel of 32 individual goods (and services) prices in 48 U.S. cities since 1975. We find that measures of the responsiveness of prices to exchange rates depend significantly on whether or not expected monetary policy is considered. We also find that estimated equations ignoring monetary policy are much more likely to appear unstable than those incorporating monetary policy variables.

94-33 "The Components of the Bid-Ask Spread: A General Approach," by ***Roger D. Huang*** *and* ***Hans R. Stoll****. (May 3, 1996)*

A simple time-series market microstructure model is constructed within which existing models of spread components are reconciled. We show that existing models fail to decompose the spread into all its components. Two alternative extensions of the simple model are developed to identify the adverse selection, inventory holding, and order processing components of the spread as well as to estimate the spread at which trades occur. One extension relies on the serial correlation properties of trade flows and the other on the contemporaneous cross-correlation of trade flows in different stocks. The empirical results support the presence of a large order processing component and smaller, albeit significant, adverse selection and inventory components. Estimates of the spread components are sensitive to assumptions about the relation between orders and trades.

94-34 "Dynamic Investment-Mode Strategy and Economic Performance," by ***Myeong-Hyeon Cho****.* (Forthcoming in *Strategic Management Journal*)

This research provides a theoretical argument on optimal investment-mode strategy under uncertainty, and presents empirical support for the argument. Theoretical analysis suggests that joint ventures tend to be the optimal mode of investment when firms make an initial investment in markets where they have no operating experience. On the other hand, acquisitions tend to be the optimal mode of investment when firms make subsequent investments in the markets where they have learned sufficiently through operating experience. This argument is supported by the empirical findings that, in case of investment in foreign markets, firms that choose the suggested optimal investment mode realize significantly higher economic gains than firms that do not.

94-36 "Ownership Structure and Investment Decisions: An Empirical Analysis," by ***Myeong-Hyeon Cho****.* (Forthcoming in *Journal of Financial Economics*)

This paper presents evidence that investment and dividend decisions are affected not only by firm's liquidity but also by its ownership structure, supporting Jensen's (1986) argument. Evidence also shows that ownership structure affects the value of the firm through the investment and dividend decisions, providing an extension to the existing studies on the relationship between ownership structure and the value of the firm. The results of the paper also validate, at least partially, Miller and Rock's (1985) argument that dividend signaling may lead to underinvestment.

94-48 "Client-Auditor Realignment and Restrictions on Auditor Solicitation," by ***Paul K. Chaney, Debra C. Jeter,*** *and* ***Pamela Erickson Shaw****. (December 1995)*

We compare clients' realignment decisions in markets permitting direct uninvited solicitation (allowed markets) and markets prohibiting such practices (banned markets), providing insight into the effects of increased competition on client-auditor alignment. We argue that solicitation influences realignment decisions if clients do not invite nonincumbents to submit proposals, and net economies are available (i.e., the cost savings from switching auditors exceeds any transactions costs incurred in realignment). by examining realignments among Big Eight auditors during the period 1980 through 1988, and by controlling for other variables associated with auditor switching, we are able to focus on the effects of solicitation in a setting of homogeneous audit quality and diversity in state boards' direct solicitation rules. We find that realignment occurs more frequently in the allowed market than in the banned market. Thus, in markets where auditors are allowed to approach prospective clients with proposals, clients become better informed and may reduce inefficiencies once unveiled. We also present evidence that realignment is positively

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associated with changes in client characteristics and negatively associated with transactions costs.

94-49 "The Use of Accruals in Income Smoothing: A Permanent Earnings Hypothesis," ***by Paul K. Chaney, Debra C. Jeter, and Craig Lewis.*** *(May 1996)*

We suggest and present evidence that managers smooth income around their assessments of the firms' permanent earnings. We suggest that income smoothing is a long-term strategy which accomplishes multiple purposes. We form predictions regarding the direction of discretionary accruals in a given year by comparing income before discretionary accruals to the previous year's reported earnings. We further hypothesize and present evidence that earnings response coefficients, which measure the extent to which reported earnings reflect the information used by the market in forming prices, are higher for firms that engage consistently in income smoothing.

94-52 "Estimation of First Order Autoregressive/Unit Root Models with Rounding," ***by Clifford A. Ball.*** *(May 1995)*

Time series observations are often rounded but are commonly estimated as if no rounding were present. In this paper we study first order autoregressive models subject to rounding. We examine simple adjustments to estimators that are calculated ignoring rounding. In addition, we implement maximum likelihood estimation of these models using rounded data. We also document the limiting distribution of autocorrelation statistics when the underlying time series is subject to unit roots and rounding. We investigate small sample properties of the estimators by simulation.

95-01 "Regime Shifts in Short Term Riskless Interest Rates," ***by Clifford A. Ball and Walter N. Torous.*** *(August 25, 1995)*

Chan, Karolyi, Longstaff, and Sanders (1992) find no evidence that the October 1979 change in Federal Reserve operating policy resulted in a once-and-for-all deterministic break in the behavior of short term riskless interest rates. In contrast, we provide evidence of such a regime shift even after allowing the volatility of interest rate changes to depend on the level of interest rates. However, rather than modeling this regime shift as a permanent event with no further shifts possible, it is more realistic to model the change in regimes itself as a random variable. Accordingly, we put forward a stochastic volatility interest rate model which generalizes previous specifications of interest rate dynamics and allows testing for stochastic regime shifts. This Markov regime shifting model provides a more accurate description of the behavior of U.S. short term riskless interest rates. We also consider a specification that allows interest rate volatility to follow a diffusion process and we provide a statistically efficient integration-based filtering procedure to estimate its parameters. Given U.S. short term riskless interest rate data, we cannot statistically distinguish between these alternative models. In either case, once the stochastic nature of interest rate volatility is taken into account, we find little or no evidence of a deterministic structural break in corresponding stochastic volatility interest rate dynamics around October 1979.

95-02 "Purchasing Power Disparity: Exchange Volatility, Trade Barriers and Other Culprits," ***by David C. Parsley and Shang-Jin Wei.*** *(April 1995)*

Using a panel of 12 tradable sectors in 14 OECD countries, we study the deviations from purchasing power parity during the recent floating exchange rate period. (1) We find some evidence that the deviations are positively related to exchange rate volatility as well as to transportation costs. (2) Once we have controlled for these two factors, free trade areas such as the EC and the EFTA do not seem to reduce significantly the deviations from PPP relative to other OECD countries. (3) Although using the post-1973 data, we are able to find strong evidence of mean reversion towards PPP. The random walk hypothesis can be rejected at the one percent level. The estimated half lives of the deviation from PPP are about five years for the non-EMS countries in the sample, and four and a half years for EMS countries. (4) We find evidence of nonlinearity in the rate of mean reversion: The convergence occurs faster for country pairs with larger initial deviations. Finally, (5) although deviations from PPP are stationary, it appears that goods prices, not nominal exchange rates, carry out most of the adjustment.

95-04 "Equity Return Dispersions," ***by William G. Christie and Roger D. Huang.*** *(July 1994)*

The level of dispersion, defined as the cross-sectional standard deviation of returns, quantifies the average proximity of individual returns to the mean. We find that dispersions vary inversely and monotonically with size, but are relatively uniform across industries. We also find that the intertemporal variation in dispersions contains a seasonal component and is systematically related to business cycles and conditions. These results have implications for the implementation and the interpretation of investment replication strategies and performance-based compensation methods.

95-05 "The Market for Audit Services When Firms Go Public," ***by Chris E. Hogan.*** *(May 1996)*

This study examines the tradeoffs that an entrepreneur makes in an initial public stock offering between the incremental costs and benefits of selecting a Big Six audit firm. The benefit of hiring a Big Six auditor is assumed to be reduced underpricing, consistent with Beatty (1989) and Balvers, McDonald and Miller (1988). The incremental cost of hiring a Big Six auditor is higher auditor compensation. Using self-selectivity analysis as discussed by Maddala (1983) and a sample of IPO's during the early 1990's, this study provides evidence consistent with IPO firms are selecting the type of auditor which minimizes the costs of underpricing and auditor compensation.

95-06 "Risk Avoidance in Audit Markets," ***by Chris E. Hogan and David D. Williams.*** *(October 1994)*

This study examines the effect of perceived client risk on audit fees for Local, National, and Big Six auditing firms and the effect of client risk on the auditor selection decision. We find that audit fees for Big Six firms are increasing in perceived risk, and the probability of selecting a Big Six auditor is decreasing in risk for medium-sized firms. The results provide evidence that differential pricing of audit services due to risk considerations can affect the level of auditor credibility selected by client firms.

95-13 "Environmental and Financial Performance: Are They Related?" ***by Mark A. Cohen, Scott A. Fenn, and Jonathan S. Naimon.*** *(April 1995)*

Prior research on the relationship between financial and environmental performance has been contradictory. There are both theoretical and empirical reasons for this lack of consensus. Because complying with environmental regulation can be costly, it might hurt a firm's bottom line. On the other hand, a firm that is efficient at pollution prevention or control might also be more efficient at production. Moreover, a firm that does well financially can afford to spend more of its resources on cleaner technologies. Among the reasons for the past discrepancy in empirical findings has been a lack of objective criteria for evaluating environmental performance and a variety of interpretations of what it means to be a "green" investor. Some authors have looked at subjective rankings by public interest groups, others have examined pollution control expenditures across industries, while others have compared the market returns of socially conscious mutual funds or environmental sector funds to overall market trends.

This Study reports on a new objective data set detailing the environmental performance of the Standard and Poor's 500 companies. Industry-balanced portfolios were constructed and the financial returns of the "high pollution" portfolios were compared to those of the "low pollution" portfolios. Overall, the study found no penalty for investing in a "green" portfolio and, in many cases, lower pollution portfolios achieved better returns than high pollution portfolios and the S&P 500 index. The study also examines the stock market reaction to new information on the environmental performance of individual firms, and provides a preliminary analysis of which comes first - good financial performance or good environmental performance.

95-17 "FX Spreads and Dealer Competition Across the 24 Hour Trading Day," by ***Roger D. Huang*** *and* ***Ronald W. Masulis.*** *(October 4, 1995)*

Quote behavior in the spot FX market for Deutschmark-US Dollar is examined using tick-by-tick inter-bank quotes from Reuter's FX screen for a one year period. We attribute the variation in FX bid-ask spreads primarily to the changing levels of market competition and inventory holding costs. We find that dealer bid-ask spreads decrease with greater numbers of competing dealers, as the ability to layoff undesirable inventory positions rises and as the dispersion of dealer inventory positions widens. Counteracting the decrease in bid-ask spreads is an increase associated with greater disagreement among dealers regarding the value of the underlying exchange rate. We also report and account for the strong seasonalities in the number of dealers, number of quotes, mid-point volatility, bid-ask spreads and spread dispersion that in part are induced by differing geographic concentration of activity over the 24 hour trading day.

95-18 "The Information Content of Value Line Convertible Bond Rankings," by ***Craig M. Lewis****, Richard J. Rogalski, and James K. Seward. (August 1995)*

This paper examines the information content of Value Line's convertible bond recommendations. We demonstrate that Value Line's convertible bond recommendations earn significant returns over time, a finding that is consistent with other studies that document the investment performance of Value Line recommendations for common stock and call options. However, these findings change once we use risk-adjusted returns. Further analysis demonstrates: (1) Value Line only does a good job identifying poor convertible debt performance; (2) convertible bond performance depends more on the revised bond ranking rather than the number of levels the ranking is changed; (3) investors can earn significantly higher returns using common stock rankings to invest in convertible bonds rather than the convertible bond ranking.

95-22 "Convergence to the Law of One Price without Trade Barriers or Currency Fluctuations," by ***David C. Parsley*** *and Shang-Jin Wei. (October 1995)*

Using a panel of 51 prices from 48 U.S. cities we provide an upper bound estimate of the rate of convergence to Purchasing Power Parity (PPP). We find convergence rates substantially higher than typically found in cross-country data. For tradables, the average half life of the price gap is less than four months. Even within the group of services that would customarily be classified as non-tradable in an international context, we find that price disparities disappear rapidly. The half life of deviations from PPP is less than five quarters for all but one of the services we examine. We also present evidence that convergence rates are non-linear in the initial price difference. In particular, convergence occurs faster for larger price differences. Finally, we find that rates of convergence are slower for cities farther apart. However, using our estimates we find that transport costs account for only a small portion of the much slower cross-border convergence rates.

95-25 "The Economic Causes and Consequences of Corporate Divestiture," by Myeong-Hyeon Cho and ***Mark A. Cohen.*** *(September 1995)*

95-30 "Do Market Makers Suffer from Splitting Headaches?" by ***Roger D. Huang*** *and* ***H. Martin Weingartner.*** *(June 28, 1996)*

Studies of transactions surrounding stock split ex-dates often conclude that splitting firms either experience a decline or an improvement in their stock's liquidity based on independent measures of trading costs and trading activity. In contrast, our evidence suggests that splits from outside into what is often deemed to be the "optimal" stock price range of $10.00 to $39.99 are "non-events" for market participants: the splits neither increase nor decrease market liquidity. Our analysis accounts for the interdependencies between bid-ask spreads and market microstructure effects, and distinguishes between optimal and all other splitting firms. The results show that stock splits do not affect market makers' profits and that, for firms in the optimal sample, splits do not alter market makers' responses to splits by altering the way they set their spreads.

95-41 "New Evidence on the Origins of Corporate Crime," by Cindy R. Alexander and ***Mark A. Cohen.*** (Forthcoming in *Managerial and Decision Economics*)

The intuition that poorly performing corporations are more likely to engage in crime is found throughout the contemporary literature on the economics and law and economics of corporate misconduct. Yet little evidence of such a relationship exists. This paper presents new evidence on the relationship between prior performance and corporate crime, using panel data on public corporations, 1975-1992. When prior performance is measured in terms of earnings, only very weak evidence of a relationship is found. However, we find that a low rate of sales or employment growth by the firm tends to be a good predictor of environmental crime, and that environmental crime tends to occur in industries that have had relatively high rates of growth, as measured by employment or sales. This suggests that it is the performance of the firm rather than or relative to that of the industry that matters. Support for this finding is robust. The data provide weaker support for the notion that prior performance affects the occurrence of other types of corporate crime, particularly fraud. This may reflect the presence of mechanisms through which potential fraud victims, unlike potential environmental crime victims, can and do respond to events that would increase their chances of becoming crime victims by taking steps to prevent it. Finally, larger firms are found significantly more likely to have engaged in crime than smaller firms, contrary to recent suggestions from the literature.

95-42 "Information As Regulation: The Effect of Community Right to Know Laws on Toxic Emissions," by ***Mark A. Cohen*** *and Shameek Konar.* (Forthcoming in *Journal of Environmental Economics and Management*)

There is growing academic and policy-level interest in the use of information as a quasi-regulatory mechanism. Examples of recently enacted information remedies include mandatory disclosure of toxic chemical emissions, securities regulations requiring disclosure of certain environmental liabilities, and European government sponsored "green labels." Mandatory disclosure requirements might be viewed as a form of "market-based incentive" for firms to change their behavior. However, little evidence to date has been gathered on the effect of these disclosure requirements on firm behavior. This paper provides some initial answers by examining firm behavior in response to disclosures that they were among the largest emitters of toxic

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chemicals in the U.S. We first examine those firms that experienced the largest decline in stock price immediately following the release of this information to the public. We find that firms that received the largest stock price decline subsequently reduced their emissions more than their industry peers. This is consistent with the view that financial markets provide a strong incentive for firms to change their environmental behavior.

96-01 "The Initiation and Withdrawal of Odd-Eighth Quotes Among Nasdaq Stocks: An Empirical Analysis," by ***William G. Christie and Paul H. Schultz.*** *(July 1996)*

This paper studies 67 (58) Nasdaq stocks whose market makers initiate (withdraw) odd-eighth quotes between January 1991 and March 1994. These regime shifts are noteworthy for their abruptness; most are completed within a few hours. We find an equally dramatic change in both dollar and percentage spreads that coincides with the adoption/removal of odd-eighth quotes. In most cases, the impact on trading costs is not accompanied by comparable changes in the costs of making markets. These results are inconsistent with many of the explanations offered for the absence of odd-eighth quotes among Nasdaq issues and serve as a challenge to existing models of competitive market making.

96-02 "Dealer Markets Under Stress: The Performance of Nasdaq Market Makers During the November 15, 1991 Market Break," by ***William G. Christie and Paul H. Schultz.*** *(November 1995)*

This paper tests whether the market reforms enacted subsequent to the crash of 1987 were sufficient to ensure that Nasdaq market makers provided liquidity during the market break on November 15, 1991. We find that bid-ask spreads and the percentage of dealers posting inside bid or ask quotes remained virtually unaffected despite the large declines in equity values experienced over very short time intervals. Our evidence implies that the regulatory changes were effective in maintaining the liquidity of the Nasdaq market during periods of unusual price fluctuations.

96-05 "Earnings Management Around Seasoned Equity Offerings," by ***L. Shivakumar.*** *(March 23, 1996)*

This paper examines earnings management around seasoned equity offerings. Consistent with managers managing earnings, we find offering firms to have temporarily high earnings around the offering. The temporary increase in earnings around the offering appears to be primarily driven by abnormally high accruals in this period. By relating our estimates of the abnormal accruals to the incentives and abilities of managers to manage earnings, we show that these abnormal accruals result from earnings management. Finally, we show that the earnings management before an offering announcement partly explains the negative market reaction to the offering announcement.

96-06 "Estimating Abnormal Accruals for Detection of Earnings Management," by ***L. Shivakumar.*** *(March 31, 1996)*

This paper addresses certain methodological issues that arise in estimating abnormal (or discretionary) accruals for detection of event-specific earnings management. This paper examines the specification of time-series models as well as cross-sectional models of expected accruals using annual as well as quarterly data. We show that time-series models provide highly imprecise estimates of abnormal accruals due to the small number of observations available for estimating the parameters of the model. We also show that the cross sectional Jones model yields systematically positive (negative) estimates of abnormal accruals for firms whose cash flows are below (above) their industry median. This paper presents an improved model for estimating abnormal accruals that overcomes several problems with the existing accrual models. This new accrual model is shown to be well specified for all cash flow levels. Further, using mean squared prediction errors as well as simulation analysis, we show that this new accrual model is more powerful than the cross-sectional Jones model in detecting earnings management. In addition, this paper examines differences in the power of several current accrual models in detecting earnings management across audited and unaudited quarters. Finally, this paper examines the limitations of the models proposed by Dechow, Sloan and Sweeny (Accounting Review, 1995) and by Kang and Sivaramakrishnan (Journal of Accounting Research, 1995).

96-07 "Financing Valuable Investment Projects in Japan: Agency Costs, Organizational Structure, and Debt Markets," by ***Roger D. Huang, Hoje Jo, and Yong H. Kim.*** *(January 15, 1996)*

According to the agency hypothesis, corporations choose equity over debt in financing profitable new investments when agency costs are high. The Japanese institutional environment permits an examination of the agency hypothesis for firms with different organizational and debt structures. The negative relation between total debt-equity ratio and growth opportunities observed for U.S. firms in previous research is found only for non-keiretsu firms and not for firms who are members of a keiretsu group. In addition, the growth opportunities of keiretsu firms are unrelated to their use of long-term debt equity ratios. These results provide strong support for the agency hypothesis.

96-08 "Agency Problems, Information Asymmetries and Convertible Debt Security Design," by ***Craig M. Lewis, R. Rogalski, and J. Seward.*** *(November 1995)*

This paper provides empirical evidence regarding the design of convertible bonds. Our empirical tests examine four attributes of the convertible debt financing decision: post-conversion equity ownership by the bondholders, issue maturity, call structure, and abnormal returns on the issue announcement date. Collectively, our results suggest that investor concerns about asset risk, and the potential for managers to increase that risk after issuance, are the strongest influences on the design of convertible debt and the manner in which investors react to the announcement of new convertible debt issues.

96-11 "Imperfect Competition, Diffusion of Information into Security Prices, and the Adverse Selection Costs of Trading: Some Empirical Evidence," by ***Tarun Chordia and Bhaskaran Swaminathan.*** *(March 1995*

This paper empirically examines the relation between the degree of correlation in the signals received by the informed traders, and the speed of adjustment of stock prices and the market liquidity of a security. Using the average correlation in the analyst forecasts and the number of days to the next earnings announcement as proxies of the degree of correlation in the signals of the informed traders, we find that stocks with a higher degree of correlation in informed signals lead stocks with a lower degree of correlation in informed signals. Preliminary cross-sectional tests indicate that the liquidity (market depth) after the last earnings analyst forecast prior to the earnings announcement is higher for securities with a lower degree of correlation in informed signals.

96-14 "A Difference Estimator for Testing Equality of Variances for Paired Time Series," by ***Luke M. Froeb.*** *(1996)*

TA difference estimator of the standard error for the difference in variances of paired time series is proposed. The difference estimator uses the asymptotic independence of periodogram ordinates to remove nuisance parameters. The difference estimator is easier to compute than one centered on the

smoothed periodogram, but shares the same finite sample shortcomings for non normal series.

*96-15 "An Innovation Variance Ratio Test," by **Luke M. Froeb**. (1996)*

An innovation variance ratio test based on differences between two integrated log periodograms is derived. The test uses a difference estimator to compute test statistics for the difference. We demonstrate the test by estimating the innovation variance ratios of Nasdaq intraday stock prices surrounding a decrease in tick size.

*96-16 "Measuring Linear Dependence in Inventory Models," by **Luke M. Froeb**. (1996)*

Inference about production smoothing is complicated by the existence of unobserved shocks. The magnitude of the unobserved shocks can be measured in linear models by measuring linear dependence between production and sales (Geweke, 1992). This paper investigates the relationship between linear dependence and production smoothing in a cross section of industries. We examine volatility measures of smoothing as well as spectral measures of smoothing. We find no evidence of smoothing, using either measure, when linear dependence is high, i.e. unobserved shocks are "small." Significant smoothing is found only when linear dependence is low, i.e. unobserved shocks are "large." These results suggest that the observed smoothing is an artifact of unobserved shocks, and that smoothing, at least at the industry level of aggregation, is not an important empirical phenomenon.

*96-17 "Aggregation Bias in Demand Estimation Using Average Revenue Data," by **Luke M. Froeb, David T. Scheffman, and Gregory Werden**. (1996)*

Much demand estimation is performed using average revenue as a proxy for price. Average revenue is a share-weighted, linear index of price, which consequently introduces two potential sources of bias. First, if the underlying demand curve is not linear, the proper functional form for aggregation is also not linear. Second, because the share weights vary with price, a spurious correlation between quantity and the price variable is induced. We derive the bias for linear and constant elasticity demand specifications. In both cases the instrumental variables estimator is negatively biased (for elastic demand), i.e., the estimated demand is too elastic.

*96-18 "Income Smoothing and Firm Characteristics," by **Paul K. Chaney and Debra C. Jeter**. (March 1996)*

We present evidence on the characteristics of firms whose managers use discretionary accruals to smooth income around the managers' assessment of the firms' permanent earnings in comparison to firms whose managers do not smooth income or who smooth less consistently. We perform a comparison of characteristics of smoothers and non-smoothers associated with greater opportunities and/or incentives for income smoothing, using two approaches to separate firms into the two classifications.

Based on a multivariate analysis, we provide evidence that firms that smooth income tend to be larger on average, to have higher stock market returns and larger discretionary accruals (in absolute value), all significant at the 0.01 level. Finding evidence that smoothers are larger and have greater discretionary accruals is consistent with an argument that these firms have greater opportunities to move reported earnings toward the managers' assessment of permanent earnings than do smaller firms or firms with smaller discretionary accruals. We also provide evidence that firms in the lowest earnings decile for their industry are less likely to smooth than other firms.

*96-19 "Industry Specialization by Auditors," by **Chris E. Hogan and Debra C. Jeter**. (June 1996)*

The issue of auditor concentration has long been of interest to accounting researchers. We examine changes in concentration and in market share for industry leaders from 1976 to 1993 and, in contrast to prior literature, provide evidence that scale economies or superior efficiencies of heavy-involvement auditors are not limited to regulated industries but extend to nonregulated industries as well. In recent press, the Big Six audit firms have claimed that specialization is a goal of increasing importance. One of the firms, Peat Marwick, has even restructured their firm along industry lines. They claim to be recruiting professionals for national teams of multi-disciplinary experts organized to "focus on the same industry to serve clients optimally." On the other hand, litigation concerns might prompt auditors to diversify their risks by diversifying their clientele. In this study, we examine trends in industry specialization and the industry factors which may affect specialization, whether market share increases are greater for audit firms classified as specialists, and whether the Big Six audit firms have increased their market share in the industries which they have identified as their focus industries. We find evidence that concentration levels have increased over this period, consistent with the claims of the Big Six firms. We find that auditor concentration levels are higher in regulated industries and more concentrated industries, but levels of concentration have increased over time in nonregulated industries. We find that for the audit firms classified as market leaders at the beginning of the year, market share has increased over time, whereas market share has declined for firms with smaller share at the beginning of the year. This suggests that there are returns to investing in specialization.

*96-20 "Margin Adequacy in the Crude Oil Futures Market," by **Theodore E. Day and Craig M. Lewis**. (July 1996)*

This paper examines the adequacy of initial margin requirements in the crude oil futures market. We show that the option to default on a futures position implies that the initial margin requirement and the current futures price can be used to determine the strike price for a down-and-out call (up-and-out put) option that provides the same payoffs as a long (short) position in a futures contract. Given this equivalence, initial margin requirements are adequate only if the initial margin which must be posted is at least equal to the ex ante value of the option-like payoff to the futures position. Using an argument similar to put-call parity, we show that this level of margin reduces the value of a trader's option to default to zero. Our analysis of the data shows that on average the New York Mercantile Exchange set initial margin requirements somewhat higher than required to eliminate the ex ante value of traders' options to default. We also examine the impact of margin requirements on futures market participation by estimating a simultaneous equations model for the open interest and volume in the crude oil futures market.

*96-21 "Trading Activity and Price Volatility on the London Stock Exchange," by **Roger D. Huang, Ronald W. Masulis, and Victor Ng**. (July 1, 1996)*

This study examines the relation between stock price volatility and trading activity on the London Stock Exchange. Daytime and nighttime volatility are separated and a variety of trading activity are examined. The strong serial correlation in trading activity measures is accounted for by separating these measures into their conditional expectation and unexpected shock components. Some prior research has argued that a sufficient statistic for trading activity is the number of transactions. We find that the trading activity measures which have the most explanatory power are the number of shares traded and the market value of the trades. Our evidence is more supportive of adverse selection based market microstructure models than the mixture of distributions based models. ■

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