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FINANCIAL MARKETS

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FINANCIAL MARKETS RESEARCH CENTER • 1997

Conference on

Ten Years Since The Crash

Ten years ago, the Dow Jones Industrial Average fell by more than 30 percent in the four trading days from the opening on Wednesday, October 14, to the close on Monday, October 19. At today's index level, this represents a decline of about 2,200 points. While observers continue to disagree as to the real "cause" of the crash, all agree that there was serious question on Monday, October 19, and Tuesday, October 20, whether the market could withstand the shocks imposed on it. In the ensuing ten years, a variety of regulatory changes have been implemented, including coordinated circuit breakers, improved clearing and settlement procedures, changes in margins, increased market making capacity, and improved capital adequacy. These changes are intended to limit the chances that trading institutions themselves would exacerbate the crash and to provide a trading infrastructure sufficient to accommodate the large volume of trading common in periods of great stress.

Panel members - William Johnston, Susan Phillips, and Joshua Gotbaum

The Financial Markets Research Center, with the help of a special grant from the New York Stock Exchange, sponsored a conference, Ten Years Since the Crash, that took place April 10th and 11th, 1997 at the Owen Graduate School of Management, Vanderbilt University. The purpose of the conference was to review regulatory changes since the crash and to consider the outlook for the future.

The conference began with a session on market making, which was chaired by **Roger Huang**, professor at the Owen School and associate director of the Financial Markets Research Center. **Bill Christie**, associate professor at Owen, presented his paper, "Dealer Markets under Stress: The Performance of Nasdaq Market Makers during the November 15, 1991 Market Break," (written with Paul Schultz). The paper analyzes various measures of market making quality, such as the size of the spread and the number of market makers. It concludes that Nasdaq dealers performed well in the mini-crash of November 1991. Christie and Schultz ascribe the smooth operation of the Nasdaq Stock Market to market reforms introduced after the crash of 1987 and to the widening of spreads on Nasdaq between 1987 and 1991.

Erik Sirri, chief economist of the Securities and Exchange Commission, provided a commentary on current regulatory work by the SEC in the market making area. He noted that the SEC had been working on preferencing arrangements in Cincinnati, was about to release (the next day) its report on the practice of preferencing, had prepared an extensive report on the Nasdaq Stock Market, was implementing new order handling rules, would

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FROM THE DIRECTOR

A Ten!

The Financial Markets Research Center was founded ten years ago with the objective of stimulating research in financial markets, financial instruments, and financial institutions. It has been successful in that effort. Research by Center faculty has examined a wide range of issues in financial markets and has had considerable impact.

Hans R. Stoll

The Center is supported by its members, who are listed elsewhere in this newsletter. Members provide financial support and intellectual stimulus for the research activities of the Center. The Center's research is intended for public dissemination and publication in scholarly journals, and the Center does not sponsor proprietary consulting projects.

The Center, launched with the help of six members, is now supported by 16 members, of which four are lead members. We extend a special welcome to new Center members joining during the past year: Aeltus Investment Management, Inc.; Eclipse Capital Management, Inc.; Morgan Stanley Group, Inc.; Merrill Lynch & Co. Foundation, Inc.; and Thales Financial Group, Inc.

Owen faculty from the fields of accounting, economics, and finance are associated with the Center and now number 19. We welcome two new faculty members as associates of the Financial Markets Research Center. Amy Bonkoski is joining the faculty from the University of Pittsburgh where she is completing her dissertation on the role of warrant holding underwriters in the evolution of governance structure after initial public offerings. Amar Gande is joining the faculty from NYU where he is completing his dissertation on the subject of initial public offerings of ADRs.

The year 1997 also marks the tenth anniversary of Martin Geisel as Dean of the Owen Graduate School of Management. Marty has made a tremendous difference to the Owen School and to the Financial Markets Research Center. He has consistently focused on faculty quality and has strongly supported the research objectives of the Financial Markets Research Center. The Center and the Center faculty owe a great deal to him for his outstanding leadership of the school.

In this year of tens, the Center also took note of the tenth anniversary of the crash of 1987. The Center's spring conference, "Ten Years Since the Crash," described elsewhere in this newsletter, commemorated the event. The conference, which was supported by a special grant from the New York Stock Exchange, brought together academics, regulators, and industry executives to evaluate the regulatory changes subsequent to the crash of 1987 and to discuss the prospects for the future. ■

GOALS OF THE CENTER

The Financial Markets Research Center at Vanderbilt University fosters scholarly research in financial markets, financial instruments, and financial institutions. Research of the Center may focus on participants in financial markets, such as brokers, exchanges, and financial intermediaries, on businesses needing financing, and on appropriate regulatory policy. The Center

1. Provides a mechanism for interaction between representatives of the financial community, researchers in financial markets, and the faculty at Vanderbilt.

2. Identifies critical research issues in financial markets and provides a focus for such research.

3. Supports research by faculty members and Ph.D. students at Vanderbilt by maintaining data bases and funding research projects.

4. Guides and disseminates research about financial markets.

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Senior Advisor

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 research sponsors including foundations, government agencies, trade organizations, and corporations.

Current Center members are:

Aeltus Investment Management, Inc.
America's Community Bankers
*Chicago Board Options Exchange
Chicago Mercantile Exchange
Eclipse Capital Management, Inc.
Equitable Securities Corporation
Hull Trading Company
Merrill Lynch & Co. Foundation, Inc.
Morgan Stanley Group, Inc.
*New York Stock Exchange, Inc.
*Refco Group, Ltd.
*State Street Global Advisors
Thales Financial Group, Inc.
Timber Hill Inc.
Van Hedge Fund Advisors, Inc.
Willis Corroon Group plc

*Indicates a lead member.

Ten Years Since the Crash *(continued)*

analyze the effect of reduced minimum quote size to 100 shares, and was examining the OTC Bulletin Board and the trading of unregistered foreign stocks. Sirri concluded by noting the guiding factors underlying regulatory policy: to recognize new technology, to promote fair markets, to avoid regulatory arbitrage, and to protect investors.

The second session on Thursday morning examined the operation of circuit breakers. The session was chaired by **Robert Davis**, director of government relations at America's Community Bankers. At the time of the crash of 1987, Davis was a commissioner of the Commodity Futures Trading Commission. The first paper, "Another Day, Another Collar: An Evaluation of the Effects of NYSE Rule 80A on Trading costs and Intermarket Arbitrage," was presented by **James Overdahl**, from the Office of the Comptroller of the Currency, (written with Henry McMillan). Rule 80A limits index arbitrage by requiring that sales of stocks take place on an up tick. The paper concludes that the rule curtails the volume of index arbitrage, although the markets remain linked.

In a paper, "Setting NYSE Circuit Breaker Triggers," (with John Paul Broussard) **Geoffrey Booth**, professor at Louisiana State University, examines the statistical distribution of extreme price changes in the Dow Jones Industrial Average. They conclude that the failure to adjust the fixed point circuit breaker will result in many more market shut-downs than initially contemplated. The 250 point circuit breaker initially represented a decline of about 12% in the Dow, an event which could be expected about every 11 years. Even the new 350 point circuit breaker implemented in early 1997 represents a decline of only 5%, an event which can be expected every 172 days.

Rick Kilcollin discussing futures clearing.

George Sofianos, managing director of the New York Stock Exchange, reviewed the operation of circuit breakers and discussed the various other changes made by the NYSE in response to the crash of 1987. He noted that the Rule 80A 50-point trigger to limit index arbitrage is set in motion almost daily; yet there is little apparent effect on prices nor is there much demand for changes in the rule from index arbitrage firms. Sofianos also pointed out that the NYSE is now capable of handling 2.5 billion shares per day, that specialist capital requirements have increased, and that T+3 settlement and T+1 trade comparison have now been implemented.

The first session after lunch examined the important issues of clearing arrangements and margin policy. The session was chaired by Rick Kilcollin, president of the Chicago Mercantile Exchange. **Pat Parkinson**, associate director of the Division of Research and Statistics at the Federal Reserve Board, led off with a talk on "Improving Clearance and Settlement Systems." Parkinson has been chairman of at least three study groups organized under the auspices of the Bank for International Settlements to study clearance and settlement arrangements. The latest of these prepared a report on clearing arrangements for exchange-traded derivatives. Parkinson discussed the various institutional arrangements for mitigating clearing risk that exists when delivery of securities is not simultaneous with payment for those securities. He noted that we are making good progress in shortening the settlement period. Yet problems remain, particularly in the cross-border arena.

Rick Kilcollin reported on common banking and common clearing, currently being discussed by the Chicago exchanges. He noted the difficulty of reconciling the divergent interests of exchanges, of large clearing firms, of small firms, and of the public interest. In a comprehensive review of margin policy entitled, "Margin Requirements, Volatility, and Market Integrity: What have we learned since the Crash?" **Paul Kupiec** of the Federal Reserve Board concluded that academic evidence does not support the hypothesis that there is a stable inverse relationship between margin requirements and stock return volatility.

Paul Kupiec answering a question.

The Thursday sessions concluded with a panel on the Crash of 1987: Retrospect and Prospect, chaired by **Duke Chapman**, former chairman of the Chicago Board Options Exchange and now vice chairman of First Chicago ABN Ambro. Participating as panel members were **William Johnston**, president of the New York Stock Exchange, **Joshua Gotbaum**, assistant secretary for Economic Policy at the Department of the Treasury, and **Susan Phillips**, Governor of the Federal Reserve Board. Billy Johnston, who for many years was one of the most respected and experienced specialists on the New York Stock Exchange floor, reported on the crash as viewed from the "trenches." He also reviewed the changes at the New York Stock Exchange to limit the impact of any future market breaks.

Joshua Gotbaum also experienced the crash first hand while working at Lazard Frères. He reviewed the operation of the Working Group, the entity created after the crash to coordinate policy towards financial markets among the Treasury, the Federal Reserve Board, the SEC and the CFTC.

Susan Phillips reviewed the regulatory developments since the crash and noted the need for innovative approaches to improving oversight of financial markets. In particular, she questioned the desirability of circuit breakers. She pointed out that the scariest periods during the market crash were those in which trading was not occurring, and she wondered why circuit

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Duke Chapman Honored

Duke Chapman inspecting new casual attire.

As chairman of the Chicago Board Options Exchange, Duke has supported the Financial Markets Research Center and served on its advisory board from the Center's inception in 1987. He was honored at a dinner on April 10th on his retirement as chairman of the CBOE. Duke is one of the most widely known and highly respected senior executives in the securities industry, having served as president of Shearson Hamill in the late 1960's, as co-chairman of Shearson Hayden Stone, and as vice chairman of American Express Bank in London prior to becoming chairman of the CBOE. Duke has been a strong supporter of the Center and a firm believer in the relevance of academic research for understanding and improving financial markets. ■

Daane Invitational Tennis Tournament

Players

The Daane Invitational Tennis Tournament, which takes place Friday afternoon immediately after the Center's conference, was played outdoors on a sunny, albeit somewhat windy, afternoon. Doubles teams are chosen randomly, and partners rotate every four games. Competition is fierce for the contents of the Daane Cup, which this year went to winner, Franklin Edwards, and runner-up, Jim Lodas. Host, Dewey Daane, noting that Jim Lodas almost invariably finishes first or second, designated Lodas as his partner for all future tournaments. ■

Ten Years Since the Crash

(continued)

breakers, designed to produce just that result, were viewed with so much approval and why so little attention was paid to restarting trading rather than stopping it. In view of the fact that market capacity, information systems, and clearing systems have been dramatically improved, she concluded that the rationale for circuit breakers has been greatly weakened.

Rich Lindsey reviewing regulatory changes since 1987.

The first session on Friday morning, chaired by **Craig Lewis**, associate professor at the Owen School, examined the topic of market valuation and instability. **Charles Lee** of Cornell University presented his paper, "What is the Intrinsic Value of the Dow?" (with J. Myers and B. Swaminathan). The paper examines the time series association of a valuation model based on the present value of future earnings as forecast by analysts with the behavior of actual prices. Lee concluded that the Dow Jones Industrial Average was 37 percent overvalued, at which point several members of the audience were seen to leave the room. Arlene Rockefeller, principal at State Street Global Advisors, commented on the Lee paper and provided an overview of financial markets since the crash of 1987.

One of the recent concerns with regard to the stability of financial markets has been the role of mutual funds. **Franklin Edwards** presented a paper, "Mutual Funds and stock Market Stability," (written with Xin Zhang). The paper examines the relation between net sales of mutual fund shares and stock market price changes. It concludes that, with the exception of the period 1971 to 1981, mutual fund net sales had no causal effect on stock market returns.

The conference concluded with the paper, "Ten Years After: Regulatory Developments in the Securities Markets Since the 1987 Market Break," presented by **Rich Lindsey**, director of the division of Market Regulation at the Securities and Exchange Commission (written with Anthony Pecora). Lindsey reviewed the traumatic events of the crash and provided an overview of the major regulatory changes in the ten years since the crash, including provisions for coordination among the markets, circuit breakers, and the recent order execution rules. He also pointed out the increases in systems' capacity due to automation, the important improvements in clearance and settlement, the tighter risk control measures, and the increase in capital levels required of brokers and other financial intermediaries. ■

Finance Student Activities

Richard Fisher receiving the Financial Executive of the Year award from Chris Hollinger, president of the Owen School Finance Association.

Owen School Finance Association

The goal of the Finance Association is to enhance Owen students' knowledge of current topics in finance as well as provide a link to the financial community. During the year the Association hosted several speakers on finance topics, and, as has become customary, the year was capped off with the presentation of the Owen Finance Association's Executive of the Year award. This year Richard B. Fisher, Chairman of Morgan Stanley Group Inc., was the award recipient.

Max Adler Student Investment Fund

The primary purpose of the Max Adler Student Investment Club is the active management of the fund created by the generous gift of Mrs. Mimi Adler in memory of her late husband, the founder of Spencer Gifts. Students gain practical experience in selecting investments and in actively managing a portfolio. This practical experience is supplemented by club sponsored investment contests and speakers from the investment community who discuss current topics and trends in the industry. ■

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 1996-97 the following researchers presented work on finance topics:

Yacine Aït-Sahalia, *University of Chicago*: "Do Interest Rates Really Follow Continuous-Time Markov Diffusions?"

Espen Eckbo, *Stockholm School of Economics*: "The Conditional Performance of Insider Trades"

John Elliott, *Cornell University*: "Market Rewards Associated with Patterns of Increasing Earnings"

Luke Froeb, *Owen School*: "Estimating the Effects of Mergers in Asymmetric Auctions"

John Geweke, *University of Minnesota*: "An Empirical Analysis of Income Dynamics among Men in the PSID: 1968-1989"

Eric Ghysels, *Pennsylvania State University*: "On the Emergence of an Emerging Market: A Study of Microstructures and Reforms Using Twelve Years of Transactions Data"

John Graham, *University of Utah*: "Debt, Leases, Taxes and the Endogeneity of Corporate Tax Status"

Stephen Gray, *Duke University*: "Target Zones and Exchange Rates: An Empirical Investigation"

Milton Harris, *University of Chicago*: "Capital Budgeting and Delegation"

Steve Heston, *Washington University*: "Valuation and Hedging of Risky Lease Payments"

Roger Huang/Ron Masulis, *Owen School*: "Trading Activity and Price Volatility on the London Stock Exchange"

Craig Lewis, *Owen School*: "Margin Adequacy in the Crude Oil Futures Market"

Vojislav Maksimovic, *University of Maryland*: "Efficiency of Bankrupt Firms and Industry Conditions: Theory and Evidence"

Ken Nyholm, *Aarhus School of Business*: "Estimation of the Effective Spread on High Frequency Danish Bond Data"

Mitchell Peterson, *Northwestern University*: "Risk Measurement and Hedging"

Paul Seguin, *University of Michigan*: "Institutional Ownership, Information and Liquidity"

Jake Thomas, *Columbia University*: "Identifying Unexpected Accruals: A Comparison of Current Approaches." ■

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 1996-97 academic year were:

Roger E. Brinner, Group Vice-President and Executive Research Director, *DRI/McGraw Hill Inc.*

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

Peter Fisher, Executive Vice President, *Federal Reserve Bank of New York*

Richard B. Fisher, Chairman, *Morgan Stanley Group Inc.*

John M. Hennessy, Chairman & CEO, *CS First Boston*

Donald L. Kohn, Director of 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 & Co.*

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

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

John Lipsky, Managing Director and Chief Economist, *Chase Manhattan Bank*

John Makin, Chief Economist, *Caxton Corporation*

Robert McTeer, Jr., President, *Federal Reserve Bank of Dallas*

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

Lawrence H. Meyer, Member, *Board of Governors of the Federal Reserve System*

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

Glenn J. Satty, Managing Director, Human Resources, *SBC Warburg*

Judith A. Sprieser, CFO & Senior Vice President, *Sara Lee Corporation*

Edward M. Truman, Director of Division of International Finance, *Board of Governors of the Federal Reserve System* ■

Current Activities of Center Faculty

Clifford A. Ball, Associate Professor (finance and statistics). M.Sc., Ph.D., mathematics (New Mexico, 1980).

Research interests include options, bond, and futures pricing and statistical applications to finance. Current research topics: risk management and value-at-risk; stochastic volatility; statistical estimation of diffusion processes employed in financial modeling. Ball teaches finance and statistics and was a finalist for the James A. Webb Award for Excellence in Teaching.

Ball attended a Wharton conference on Value-at-Risk and Risk Management in Philadelphia in October 1996 and took part in the Chicago Board of Trade conference in December. He spoke at a research conference in Siena, Italy on Risk Management and Derivatives. Ball's recent paper, "Detecting Intramarginal Intervention within a Target Zone: Application to the European Exchange Rate Mechanism," (with Antonio Roma) has been accepted for publication in *Applied Mathematical Finance.* He also serves as a referee for numerous research journals.

Paul K. Chaney, Associate Professor (accounting). M.B.A., Ph.D. (Indiana, 1983), C.P.A., C.M.A.

Research interests include the quality of earnings, earnings management, and the market for audit services.

Chaney presented "The Use of Accruals on Earnings Management: A Permanent Earnings Hypothesis" (with Debra Jeter and Craig Lewis) at the 1996 annual meeting of the American Accounting Association. One paper, "Client-Auditor Realignments and Accounting Board Solicitation Rules," (with Debra Jeter and Pam Shaw) was accepted for publication in the *Accounting Review,* while a second paper, "Income Smoothing and Underperformance in Initial Public Offerings," (with Craig Lewis) was accepted for publication in the *Journal of Corporate Finance.*

Myeong-Hyeon Cho, Assistant Professor (economics and strategy). M.B.A. (ESSEC, 1989), M.A., Ph.D. (Cornell, 1992, 1994).

Research interests 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, asset pricing, and market microstructure. Chordia teaches securities and portfolios, fixed income markets, and financial institutions classes.

During the past year, 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, "Cross-Sectional Determinants of Expected Returns," (with Michael Brennan and Avanidhar Subrahmanyam) was presented at the Utah Winter Finance conference. His papers, "Excess Volatility in Stock Prices and Fads" and "Competition and the Sale of Information," (with Bhaskaran Swaminathan) were published in *Contemporary Developments in Finance,* Editions ESKA Paris. 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).

Research interests include both corporate finance and market microstructure. His current research focuses on the impact of the SEC rule changes on Nasdaq trading costs, the link between tick sizes and trading costs, and the long run performance of seasoned equity following rights offerings.

During the past year, Christie presented his work at the University of Alberta, the University of Florida, and Cornell University. In addition, he presented "Dealer Markets Under Stress: The Performance of Nasdaq Market Makers During the November 15, 1991 Market Break" at the 1997 Financial Market Research Center Conference on 10 Years Since the Crash, and at the 1997 Journal of Financial Intermediation Conference on Liquidity. He also participated in the Conference on Dealer Markets held at Ohio State in November 1996. He served as a session chair at the 1997 Western Finance Association meetings, and at the 1996 Financial Management Association meetings. He was appointed as an Associate Editor for *Financial Management* and the *Journal of Financial Intermediation* for three year terms. During the summer of 1996, he appeared on CNBC's "Market Wrap" and "Inside Opinion", and Cnnfn's "In the Game" in conjunction with the Justice Department and SEC settlements with the

NASD and the Nasdaq Stock Market. He served as a referee for the *Journal of Business, Journal of Finance, Journal of Financial Economics, Journal of Financial Intermediation*, and the *Journal of Financial and Quantitative Analysis* during the past year.

Christie continues to teach the core finance course in the regular and the executive M.B.A. programs, and will also teach in the International Executive M.B.A. program in Miami, offered jointly with the University of Florida. Christie was among the finalists for the James A. Webb Jr. Award for Excellence in Teaching in both 1996 and 1997, and was ranked first among the "4 star" faculty in the 1996 Business Week survey. He also presented "What Effective Teaching and a Good Marriage Have in Common" in the University Teaching Series. However, the highlights of the year included his selection as an "honorary coach" by the Vanderbilt Athletic Department for the Vanderbilt versus Mississippi State women's basketball game, and his recognition by the Vanderbilt Athletic Department during the Vanderbilt versus University of Alabama-Birmingham football game!

MARK A. COHEN, Associate Professor (economics); and Director of the Vanderbilt Center for Environmental Management Studies. M.A., Ph.D. (Carnegie-Mellon, 1985).

Research interests include government regulation, law and economics, white-collar and corporate crime, and environmental management.

Professor Cohen has been actively pursuing research into the relationship between environmental performance and financial performance. He is continuing his research in this area with a grant funded by the W. Alton Jones Foundation. Two papers are now available on this topic, "Environmental and Financial Performance: Are They Related?" and "Does the Market Value Environmental Performance?" Both are under review at academic journals.

In September, Professor Cohen traveled to Duke University to assist a project team in developing a benefit-cost methodology for evaluating a long-term study of adolescent antisocial behavior funded by U.S. Department of Health and Human Services. In October, he was the guest speaker at the Kennedy-Owen Economics Symposium at the University of the south, where he lectured on the law and economics of the environment. In November, he presented a paper and chaired a panel on the "cost of crime to victims" at the annual meetings of the American Society of Criminology in Chicago. His research on the "Cost of Crime to Victims" and the "Monetary Value of Saving a High Risk Youth" received press coverage in several articles in the *New York Times*.

Cohen taught two new courses this year - Environmental Issues in Marketing and Environmental Issues in Operations. To prepare for these courses he attended a two-day conference in Toronto, Canada on environmental management, sponsored by the Management Institute for Environment and Business (MEB), and a one day workshop in San Diego sponsored by the American Marketing Association on "green marketing."

He was recently appointed to the editorial board of *Managerial and Decision Economics*.

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).

Research interests include monetary economics and international finance. He is currently engaged in writing a history of Equitable Securities Corporation, Nashville, Tennessee.

In February, March, and May, Daane attended National Futures Association board of directors and finance committee meetings in Chicago, New York, and Washington, DC. 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 33rd annual conference on Banking Structure and Competition which focused this year on technology policy implications for the future of financial services. In June, Daane participated in the Federal Reserve Bank of Boston's 41st annual economic conference on "Social Security Reform: Links to Saving, Investment, and Growth" held in Chatham, MA. In late August, 1997, Daane is scheduled to participate in the Federal Reserve Bank of Kansas City's 21st annual symposium on pubic policy issues, focusing this year on Maintaining Financial Stability in a Global Economy.

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.

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

This year Professor Froeb continued his research into computer aided merger simulation; he presented a paper on the topic at the American Economic Association meetings in New Orleans and was invited by the Canadian Government to present his work to the Competition Bureau in Ottawa. In the United States, Froeb's research has given the Federal Trade Commission and the U.S. Department of Justice, a "computational" alternative to the old "structural" merger approach.

Froeb has teamed up with two Vanderbilt math professors, Steve Tschantz and Phil Crooke, to develop computational

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Faculty Activities *(continued)*

models for analyzing mergers in sealed and oral auction markets. He is presenting the methodology to the Society for Computational Economics this summer at Stanford and to the Econometric Society in Chicago this winter.

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

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, trends in auditor industry specialization, and the information content of restructuring charges.

ROGER D. HUANG, Professor (finance). M.A., Ph.D. (Pennsylvania, 1980).

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

Since last summer, three of his papers have appeared in print. "An Analysis of Nonlinearities in Term Premiums and Forward Rates" (with Charles Lim) was published by the *Journal of Empirical Finance*, "Competitive Trading of NYSE Listed Stocks: Measurement and Interpretation of Trading Costs" (with Hans R. Stoll) was published by the *Journal of Financial Economics*. In addition, he has two forthcoming papers: "Is It Time to Split the S&P 500 Futures contract?" has been accepted by the *Financial Analysts Journal*, and "The Components of the Bid-Ask Spread: A General Approach" is scheduled to appear in the *Review of Financial Studies*. Both of the forthcoming papers are with Hans R. Stoll.

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

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

Research interests include financial accounting and auditing, with specific interest in income smoothing, components of earnings, the market for audit services, and audit opinions.

Jeter presented her paper, "Industry Specialization by Auditors," (with Chris Hogan) at the 1997 Southeast AAA Conference in April. She is serving on the AAA's New Faculty Consortium Committee for 1996-97 and was recently appointed to the editorial board of *The Accounting Review*.

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

Research interests include 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, "Initial Margin Policy and Stochastic Volatility in the Crude Oil Futures Market," (with Ted Day) was published in the *Review of Financial Studies*.

Lewis continues to work on 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, "Margin Adequacy in Futures Markets," (with Ted Day) at Virginia Tech and the University of Maryland. The paper, "Agency Problems, Information Asymmetries, and Convertible Debt Security Design," was presented at the Financial Management and American Finance Association meetings this year. Lewis 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).

Research interests include investment banking, corporate finance, financial institutions, market microstructure, and international finance. His research on capital structure changes and the security issuance process is widely referenced. His current research activities center on the ADR market, the impact of security issuance on stock liquidity, returns to investing in conversions of mutual thrifts to stock ownership, dealer spreads in the foreign exchange market, impact of organizational structure on financial leverage, and the relation of trading activity and stock price volatility on the London Stock Exchange.

Masulis served on the program committees of the Western Finance Association and the European Finance Association in 1997. This spring he gave a talk on ADR flotation costs at the NYSE sponsored conference on "Global Equity Issuance and Trading" in Cancun, Mexico and presented his paper, "FX Spreads and Dealer Competition Across the 24 Hour Trading Day," (with Roger Huang) at the University of Maryland, the London Business School, and Oxford University.

Masulis currently serves as associate editor of the *Journal of Finance*, the *Journal of Corporate Finance*, the *Journal of Financial and Quantitative Analysis*, and the *Journal of Financial Research*.

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

Research interests include the effects of exchange rates on price levels, convergence toward Purchasing Power Parity, the effects of inflation on relative prices, and the role of uncertainty and expectational errors in explaining the forward foreign exchange discount bias.

Recent published research papers include: "Convergence to the Law of One Price without Trade Barriers or Currency Fluctuations," (with Shang-Jin Wei) in the *Quarterly Journal of Economics*, "Inflation and Relative Price Variability in the Short and Long Run: New Evidence from the United States," in the *Journal of Money Credit and Banking*, and "Exchange Rate Pass-Through with Intertemporal Linkages: Evidence at the Commodity Level," in the *Review of International Economics*.

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

Research interests include 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.

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

Research interests include stock market structure and other aspects of financial markets.

Stoll was elected Vice President of the American Finance Association, the leading association of academic financial economists, in January 1997. He will serve as vice president through the Association's meetings of January 1998, as president elect and program chair for the meetings in January 1999, and as president of the Association in the year 2000. The meetings of January 1997 were held in New Orleans where Stoll chaired a session and attended several editorial board meetings.

Stoll was honored by Vanderbilt University as recipient of the Earl Sutherland Prize for Achievement in Research. The prize, presented at a meeting of the Vanderbilt Board of Trust in November, is awarded annually to the outstanding Vanderbilt researcher in all fields.

Stoll gave a talk on "Trading Mechanisms, Trading Costs, and Securities Price Behavior" at the Berkeley Program in Finance honoring Fischer Black, held in Santa Barbara in October 1996. In January 1997, Stoll spoke at a conference at the University of Osaka on the subject, "Trading Mechanisms, Trading Costs, and Regulatory Policy." He visited several universities in Hong Kong in April and spoke on the topic, "Is It Time to Split the S&P 500 Futures Contract?" at a conference on Stock Market Indexes and Index Derivatives Trading. In June, he chaired a session at the FMA International Conference in Zurich. He gave his paper, "Components of the Bid-Ask Spread: A General Approach," (with Roger Huang) at Nanzan University in Nagoya, Japan in January and at the University of Vienna in June.

Stoll's recent publications include, "Dealer versus Auction Markets: A Paired Comparison of Execution Costs on Nasdaq and the NYSE," (with Roger Huang) in the July 1996 issue of the *Journal of Financial Economics*. His paper, "The Components of the Bid-Ask Spread: A General Approach," (with Roger Huang) is forthcoming in the *Review of Financial Studies*. Other recent papers include "Expiration-day Effects of the All Ordinaries Share Price Index Futures: Empirical Evidence and Alternative Settlement Procedures" (with Robert Whaley), forthcoming in the *Australian Journal of Management*; "Is It Time to Split the S&P 500 Futures Contract?" (with Roger Huang), forthcoming in the *Financial Analysts Journal*; "Exchange Rates and Firms' Liquidity: Evidence from ADRs" (with Roger Huang); and "Affirmative Obligation of Market Makers: An Idea Whose Time Has Passed?"

Stoll continues to serve on the editorial boards of eight finance journals, including the *Journal of Finance* and the *Journal of Financial Economics*.

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

Specialty is 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, 1996 are listed below. Individual copies may be obtained by writing Mrs. Pat Scott, Owen Graduate School of Management, Vanderbilt University, Nashville, TN 37203 or calling 615-322-3671. There is a charge of $10.00 per paper for non-members of the Center. Academics may request up to five papers free of charge.

91-15 "Income Smoothing and Underperformance in Initial Public Offerings," by ***Paul K. Chaney and Craig M. Lewis.*** *(forthcoming in Journal of Corporate Finance)*

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.

92-45 "Detecting Intramarginal Intervention within a Target Zone: Application to the European Exchange Rate Mechanism," by ***Clifford A. Ball*** *and Antonio Roma. (forthcoming in Applied Mathematical Finance)*

This paper derives a statistical test, based on the first order autocorrelation, to ascertain whether a stochastic process evolving within reflecting barriers is mean reverting. Under these conditions the standard unit root analysis does not apply. Since the presence of reflecting barriers per se will induce mean reverting behavior, the detection of mean reversion inside the two boundaries requires that the effect of reflection be properly accounted for. This statistical procedure may find application in the empirical testing of target zones models for exchange rates. Krugman [1987, 1990] introduced a model of exchange rates within target zones which posits a nonlinear relation between the exchange rate and its fundamental determinants. The fundamentals process is assumed to be regulated. The nonlinear relation induces mean reversion in the exchange rates within the band. The test is applied to the exchange rate in terms of Deutsche Marks of five currencies participating in the European Monetary System. Our methodology is helpful in deciding whether the mean reverting behavior of these exchange rates is due solely to local behavior at the barriers, or whether a more complex model consistent with a nonlinear exchange rate-fundamental relation is warranted.

94-05 "Revenues of Immediacy Suppliers versus Execution Costs of Investors: Evidence from the NYSE," by ***Roger D. Huang and Hans R. Stoll.*** *(August 13, 1996)*

The per share revenue of immediacy suppliers is estimated by a measure we term the "realized half-spread." The estimate, based on the complete record of all transactions for 343 New York Stock Exchange stocks that are continuously listed n the S&P 500 in the period 1987 to 1991, is about two to three cents per share. The realized half-spread is compared with per share trading gains of securities firms as calculated from financial reports filed with the SEC. Inferences about the revenues of public limit orders as compared with the revenues of securities firms are made, and they suggest that limit orders are "picked off." The realized half-spread is reconciled with frequently used measures of investor execution costs — the quoted and effective half-spreads. Also examined are the Roll implied spread and a measure termed the perfect foresight half-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.

94-33 "The Components of the Bid-Ask Spread: A General Approach," by ***Roger D. Huang and Hans R. Stoll.*** *(forthcoming in Review of Financial Studies)*

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 all the components of the spread and to estimate the spread at which trades occur. The empirical results support the presence of a large order processing component and smaller, albeit significant, adverse selection and inventory components. The spread components differ significantly according to trade size and are also 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.

94-48 "Client-Auditor Realignment and Restrictions on Auditor Solicitation," by **Paul K. Chaney, Debra C. Jeter,** *and* **Pamela Erickson Shaw.** *(forthcoming in Accounting Review, July 1997)*

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 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.** *(January 28, 1997)*

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 and implement maximum likelihood estimation under these conditions. We also assess the adequacy of simple adjustments, based on Shephard's corrections, to estimators that are calculated ignoring rounding. The limiting distribution of autocorrelation statistics is documented when the underlying time series is subject to unit roots and rounding. We apply these methods to estimate the volatility of stock prices based on intra-day quotes. In this case frequent observations are recorded irregularly subject to bid-ask spreads.

95-13 "Environmental and Financial Performance: Are They Related?" by **Mark A. Cohen,** *Scott A. Fenn, Shameek Konar, and Jonathan S. Naimon. (May 1997)*

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.** *(December 2, 1996)*

Quote behavior in the spot foreign exchange market for Deutschmark-US Dollar is examined using tick-by-tick inter-bank quotes from Reuter's FXFX screen for a one year period. We attribute the variation in foreign exchange bid-ask spreads primarily to the changing levels of order flow, dealer 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 a measure of differing dealer inventory positions widens. Counteracting the decrease in bid-ask spreads is an increase associated with greater disagreement among dealers and/or rapidly changing dealer expectations of the spot exchange rate. We also report and account for the strong seasonalities in the number of dealers, number of quotes, midpoint 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. (forthcoming in Journal of Portfolio Management)*

This paper extends the Value Line enigma literature by examining 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, we reach the opposite conclusion when we use risk-adjusted returns. In fact, investors can earn significantly higher returns using common stock rankings to invest in convertible bonds rather than the convertible bond ranking. Further analysis demonstrates that: (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.

95-30 "Do Market Makers Suffer from Splitting Headaches?" by **Roger D. Huang** *and* **H. Martin Weingartner.** *(September 4, 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.

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

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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.*** *(forthcoming in Journal of Financial Services Research)*

During the market crash on October 19, 1987, the liquidity of the Nasdaq market was seriously undermined when dealers reputedly withdrew from market making and refused to trade with customers. This paper tests whether the market reforms enacted subsequent to 1987 improved the liquidity of the Nasdaq market during periods of market stress. Specifically, we study the liquidity of 36 Nasdaq issues on November 15, 1991, which represented the largest post-crash market break as prices fell approximately 4% in one trading session. We find that bid-ask spreads, the percentage of dealers posting inside bid or ask quotes, and trading volume 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 declines.

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. (February 1997)*

This paper provides empirical evidence regarding the design of convertible bonds. We examine three attributes of the convertible debt financing decision: post-conversion equity ownership by the bondholders, issue maturity, and call structure. We find that high post-conversion equity ownership by convertible bondholders occurs in small firms with high financial leverage, as well as issues with lower conversion premiums. Moreover, announcement period excess returns are related to the deviation of bondholders' post-conversion equity ownership from its predicted value, rather than the actual post-conversion equity ownership. Convertible debt maturity is positively related to the issuing firm's growth opportunities, size, and existing debt maturity structure, and negatively related to its financial leverage. The finding that convertible debt maturity is longer in firms with greater growth opportunities contrasts with other recent findings that document a negative relationship between straight debt maturity and the presence of growth opportunities. Call provisions are included in the majority of convertible debt issues regardless of the issuer's creditworthiness. While call provisions occupy a central role in convertible debt issues, our evidence suggests there are other factors beyond asymmetric information and financial distress costs which explain their prevalence.

96-14 "A Difference Estimator for Testing Equality of Variances for Paired Time Series," by ***Bruce Cooil and Luke M. Froeb.*** *(forthcoming in Journal of Time Series Analysis)*

A difference estimator of the standard error for the difference in variances of paired time series is proposed. The difference estimator uses the 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 small sample shortcomings for non normal series.

96-15 "An Innovation Variance Ratio Test," by ***Luke M. Froeb.*** *(July 30, 1997)*

An innovation variance ratio test based on the difference between two integrated log periodograms is derived. The test uses a difference estimator to remove nuisance spectral parameters.

96-16 "Measuring Linear Dependence in Inventory Models," by ***Luke M. Froeb.*** *(July 10, 1996)*

Inference about production smoothing is complicated by the existence of unobserved shocks. The relative magnitudes of the unobserved shocks can be measured in linear models by measuring linear dependence between production and sales. 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.

96-18 "Income Smoothing and Firm Characteristics," by ***Paul K. Chaney and Debra C. Jeter.*** *(January 1997)*

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. 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. The evidence that smoothers have higher returns is consistent with prior research suggesting that smoothing is a means to signal higher firm quality [Chaney and Lewis (1995) and Trueman and Titman (1989)]. 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 1997)*

The issue of auditor concentration has long been of interest to accounting researchers. This paper is a descriptive study serving primarily to extend and illuminate the findings of prior research (Danos and Eichenseher 1982; Kwon 1996). 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. We find that for the audit firms classified as market leaders market share has increased over time, whereas market share has declined for firms with smaller share. This suggests that there are returns to investing in specialization.

96-20 "Margin Adequacy in Futures Markets," by Theodore E. Day and ***Craig M. Lewis.*** *(February 1997)*

This paper proposes a value-based standard for setting initial margin policy. We show that margined futures positions are a type of barrier option. Given this observation, 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 a numerical valuation approach which incorporates the stochastic volatility of the futures market, we examine the adequacy of margin requirements in the crude oil futures market. Our results suggest that on average the initial margin requirements set by the New York Mercantile Exchange have been in excess of the minimum margins required under our options based standards for adequacy.

96-21 "Trading Activity and Price Volatility on the London Stock Exchange," by ***Roger D. Huang, Ronald W. Masulis,*** *and* ***Victor Ng.*** *(December 5, 1996)*

This study examines the relation between aggregate stock return volatility and trading activity on the London Stock Exchange. Daytime and overnight volatility are separated, a variety of trading activity measures are examined, and seasonalities in the data are taken into account. 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 the number of trades is a sufficient statistic for trading activity as it relates to stock volatility. In contrast, 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. This evidence is more supportive of adverse selection based market microstructure models which stress the importance of order size than the mixture of distributions based models which stress the importance of the number of trades. This is especially noteworthy since our market return volatility measure is less influenced by private information flows than is individual stock return volatility.

96-25 "Cross-Sectional Determinants of Expected Returns," by ***Michael J. Brennan, Tarun Chordia,*** *and* ***Avanidhar Subrahmanyam.*** *(July 22, 1997)*

We analyze the relation between equity returns, risk, and a rich set of security characteristics that includes institutional ownership, S&P 500 index membership, analyst following, and dispersion in analyst forecasts, in addition to previously examined variables such as the book-to-market ratio, firm size, the bid-ask spread, and lagged returns. Our primary objective is to determine whether these non-risk characteristics have marginal explanatory power relative to the Connor and Korajczyk (1988) risk factors. We also compare the different approaches that have been used to test asset pricing models against specific alternatives. We find that inferences are extremely sensitive to the sorting criteria used for portfolio formation, so that results based on regressions using portfolio returns should be interpreted with caution. Fama-MacBeth type regressions for individual securities suggest some new findings: risk-adjusted stock returns show a negative relation with dollar trading volume, and a positive relation with S&P 500 membership. However, previously noted book-to-market, size, and momentum effects are eliminated once account is taken of the above characteristics.

96-34 "Ownership Structure, Investment, and Corporate Value: An Empirical Analysis," by ***Myeong-Hyeon Cho.*** *(forthcoming in Journal of Financial Economics)*

This paper examines the relation among ownership structure, investment, and corporate value, focusing on whether ownership structure affects investment. Ordinary least squares regression results suggest that ownership structure affects investment and, therefore, corporate value. However, simultaneous regression results indicate that the endogeneity of ownership structure may severely affect these inferences, suggesting that investment affects corporate value which, in turn, affects ownership structure. In essence, the evidence shows that corporate value affects ownership structure, but not vice versa. These findings raise questions regarding the implicit assumption that ownership structure is exogenously determined, and bring into question the results in previous studies that treat ownership structure as exogenous.

96-38 "Exchange Rates, Domestic Prices, and Central Bank Actions: Recent U.S. Experience," by ***David C. Parsley*** *and* ***Helen Popper.*** *(November 1996)*

Central banks that are primarily concerned with price stability will use monetary policy to try to insulate prices from exchange rate changes. Prices then appear unresponsive to changes in the exchange rate. The observed relationships between prices and the exchange rate will reflect central bank actions instead of the underlying relationship between exchange rates and prices. This paper explicitly recognizes the role that policy plays in determining the observable relationships between exchange rates and prices; and, in so doing, it illustrates how the underlying relationships can be unraveled. Examining the recent experience of the United States, we find that the prices of various non-durable goods — and even of some services — respond modestly to the exchange rate; and we find that the responses emerge most clearly when the role of monetary policy is explicitly considered. These findings are consistent with the hypothesis that the Federal Reserve acts to mitigate the effects of exchange rate fluctuations on domestic prices.

96-44 "An Exploration of Variations in Cost Structure Across Time and Industries in the U.S. Manufacturing Sector," by ***Germain Böer*** *and* ***Debra Jeter.*** *(May 1996)*

96-45 "The Information Content of Restructuring Charges: A Contextual Analysis," ***Chris E. Hogan*** *and* ***Debra C. Jeter.*** *(June 1997)*

In recent years, the phrase "restructuring charges" has become increasingly popular and ambiguous. Whether these charges convey information or serve simply as a dumping ground to facilitate future manipulation of the earnings numbers is a question of interest to various groups. Prior empirical studies addressing the stock market reaction to the announcement of asset write-offs and/or restructuring charges have provided mixed results. For a sample of firms taking restructuring charges in the early 1990's, we examine market returns around the announcement of the restructuring charge and their relation to unexpected earnings and the components of the restructuring charge. We find evidence that the disaggregation of restructuring charges is informative to investors, and that the market views most restructuring charges as good news. However, the market responds more positively to restructuring charges categorized as asset write-offs than to those categorized as severance and other cash outlay charges. In addition, the market interprets restructuring charges differently for profit versus loss firms, and for firms with and without recent management changes.

97-01 "Industry Conditions, Growth Opportunities, and Market Reactions to Convertible Debt Financing Decisions," by ***Craig M. Lewis, R. Rogalski,*** *and* ***J. Seward.*** *(February 1997)*

This paper examines the relation between share price reactions around convertible debt issue announcements and the profitability of the issuing firm's growth opportunities. We find that investor reactions are positively related to the profitability of the issuing firm's investment opportunities, although the relationship is not statistically significant across the full issuer universe. Further analysis suggests that growth opportunities are significant determinants of investor reactions when we consider differences in issuer credit quality as well as industry-specific and industry-adjusted measures of operating and financial performance. For investment grade issuers, share price reactions depend on industry-adjusted and industry-specific growth opportunities and leverage. By contrast, speculative grade issuers have share price reactions that depend on their pre-issue profitability, pre-issue stock market conditions and industry-specific growth opportunities. Our results highlight the importance of including

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industry measures of operating and financial performance, measures of general economic conditions, and issuer creditworthiness in understanding investor reactions to convertible debt financing announcements.

97-02 "Mergers among Asymmetric Bidders: A Logit Second-Price Auction Model," by ***Luke M. Froeb****, Steven Tschantz, and Philip Crooke. (November 26, 1996)*

In this paper, we present a benchmark model for computing the effects of mergers among asymmetric bidders in a private values, oral auction. By asymmetric, we mean that bidders are drawing values out of different distributions. Such asymmetry is important for modeling the effects of mergers among obviously asymmetric bidders. The essential insight of the model is that large, high-value firms win at more favorable prices than smaller firms because they are not bidding against themselves. This gives rise to a price/share regression line that can be used to predict the effects of mergers. Since the merged coalition wins every auction that any of the coalition members would have won, the effect of a merger is computed as a movement along the regression line, from the pre merger shares to the post merger aggregate share. The parameter determining how far price moves is the variance of the idiosyncratic value component. The model is offered as a replacement for standard structural analysis of mergers based on market shares and concentration. The model can also be used as an empirical framework for recovering the joint distribution of bidders' values from aggregate or individual auction data.

97-03 "Is It Time to Split the S&P 500 Futures Contract?" by ***Roger D. Huang and Hans R. Stoll****. (forthcoming in Financial Analysts Journal)*

Yes. Less clear is the need for increasing the minimum percentage tick size.

97-04 "Exchange Rates and Firms' Liquidity: Evidence from ADRs," by ***Roger D. Huang and Hans R. Stoll****. (March 15, 1997)*

Exchange rate changes can, in principle, affect a firm's value by affecting the firm's earnings or its cost of funds. Existing studies using monthly data over long sample periods, however, find little or no impact of changes in exchange rates on a firm's valuation. We examine a different potential path for exchange rate effects, namely, the effect of exchange rate variability on a stock's liquidity. Using transactions data, we examine the behavior of United Kingdom's ADRs around the time of pound sterling withdrawal from the European Exchange Rate Mechanism in September 1992. We conclude that this period of exchange rate turbulence had little or no effect on the microstructure characteristics of the ADRs in the United States. Various measures of trading costs and liquidity are largely unaffected by the exchange rate variability.

97-05 "Regulatory Capital of Financial Institutions: A Comparative Analysis," by ***Clifford A. Ball and Hans R. Stoll****. (April 4, 1997)*

This paper reviews the forms of regulatory capital across financial institutions. There are a variety of approaches employed to set capital requirements, each with potential benefits and drawbacks. The costs of capital requirements is analyzed across institutions. We critique a number of current capital requirement practices and make suggestions for optimal allocation strategies.

97-06 "Expiration-day Effects of the All Ordinaries Share Price Index Futures: Empirical Evidence and Alternative Settlement Procedures," by ***Hans R. Stoll*** *and Robert E. Whaley. (forthcoming in Australian Journal of Management)*

Stock index futures were the most successful financial innovation of the 1980s. In spite of their widespread use internationally, they continue to be criticized for causing "aberrations" in stock market, particularly on days when futures contracts are cash-settled at expiration. This paper examines expiration-day effects of the Sydney Futures Exchange's All Ordinaries Share Price Index (SPI) futures and discusses alternative futures settlement procedures. Our investigations of the SPI futures contract expirations indicate that, while index stock trading volume is abnormally high near the close on expiration days, price movements are not different from those observed on other days. In other words, the SPI futures cash settlement at the close appears to have worked well through our sample period. This study also describes and analyzes the two basic alternative cash settlement procedures -a single price settlement and an average price settlement.

97-08 "The Efficiency of Client-Auditor Alignments in the Presence or Absence of Direct Solicitation by Auditors," by ***Paul K. Chaney and Debra C. Jeter****. (May 29, 1997)*

This paper provides a theoretical framework for examining the effects of direct uninvited solicitation activities on the efficiency of the alignment of clients and auditors, and for determining the extent to which available cost savings are passed to the client by the low-cost auditor. It also serves to provide additional insight into the interpretation and understanding of the empirical results provided in previous studies. Perhaps more importantly, it strengthens our knowledge of how competition in the market for professional services affects the accuracy of client expectations regarding the costs of switching to a new service provider, and ultimately professional fees and client decisions.

97-09 "A Re-examination of Some Popular Security Return Anomalies," by Michael J. Brennan, ***Tarun Chordia****, and Avanidhar Subrahmanyam. (June 23, 1997)*

We re-examine the relation between stock returns, measures of risk, and a set of non-risk security characteristics, including the book-to-market ratio, firm size, the bid-ask spread, the stock price, the dividend yield, and lagged returns. Our primary objective is to determine whether these non-risk characteristics have marginal explanatory power relative to the loadings on the Connor and Korajczyk (1988) risk factors. Fama-MacBeth type regressions using risk adjusted returns on individual securities shed light on earlier anomalous findings and reveal new relations. The widely cited book-to-market and momentum effects are somewhat attenuated once account is taken of the Connor and Korajczyk factors. Firm size is shown to have no incremental explanatory power for returns in the presence of trading volume, suggesting that firm size is a proxy for liquidity. Finally, dividend yield effects consistent with a changing tax code are detected.

97-10"The Costs of Trading Nasdaq Issues: The Impact of Limit Orders and ECN Quotes," by Michael J. Barclay, ***William G. Christie****, Jeffrey H. Harris, Eugene Kandel, and Paul H. Schultz. (June 1997)*

On January 20, 1997, the Securities and Exchange Commission began requiring Nasdaq market makers to execute or display customer limit orders. In addition, Nasdaq began displaying Electronic Communications Networks quotes. We assess the impact of these new rules on various measures of trading costs, including quoted and effective spreads. Using individual dealer quotes we also examine the strategic response of market makers to their increased ability to post wider spreads (through a change in the Excess Spread Rule) and to offer minimum quote sizes of 100 rather than 1,000 or 500 shares. Our results indicate that trading costs are dramatically lower in the presence of these new rules, but that trade sizes have fallen significantly, particularly among trades executed through the Small Order Execution System. However, we compute that the net effect of the rule changes is that investors save approximately $1.6 million per day among the stocks traded under these new rules.

97-11 "Mergers, Cartels, Set-Asides and Bidding Preferences in Asymmetric Second-price Auctions," by Lance Brannman and ***Luke M. Froeb****. (May 27, 1997)*

This paper studies competition in asymmetric oral auction markets for Forest Service timber. Asymmetry arises because bidders draw timber values from distributions with different means. The firm-specific means are determined

by bidder characteristics like firm size and a firm's location relative to the timber being sold. The joint distribution of bidder values for Forest Service timber tracts is estimated and used to simulate various hypothetical scenarios designed to inform public policy. The price effects of mergers or bidding cartels are found to be small, and a four percent decline in marginal costs through greater merger efficiencies is enough to offset a one percent anticompetitive price increase under a consumer welfare standard. Eliminating the Small Business Set-Aside program would raise timber revenues by 6.4%, and a policy of granting bidding preferences to small and more distant bidders would raise revenue by less than one percent.

97-12 "Properties of Computed Post Merger Equilibria," by Philip Crooke, ***Luke Froeb****, Steven Tschantz, and Gregory Werden. (June 17, 1997)*

This paper investigates the properties of four demand forms used in predicting the effects of mergers: the Almost Ideal Demand System (AIDS), logit linear, and constant elasticity. we find that choice of demand system makes a big difference in the size of the computed post merger price change. The constant elasticity demand form leads to the highest price rise; followed by the AIDS. The linear and logit demand forms result in much lower computed post merger prices. The results highlight the role played by the second and higher order characteristics of demand systems as critical determinants of the computed post merger equilibrium.

97-13 "A Robust Test for Consumer Welfare Enhancing Mergers among Sellers of a Homogeneous Product," by ***Luke M. Froeb*** *and Gregory J. Werden. (June 5, 1997)*

Antitrust enforcement agencies and courts use net effect on price as a touchstone for the legality of mergers. This paper derives a simple, and completely general, condition for implementing that standard when industry equilibrium is static Nash in quantities (Cournot).

97-14 "Affirmative Obligation of Market Makers: An Idea Whose Time Has Passed?" by ***Hans R. Stoll****. (July 11, 1997)*

Equities market makers on exchanges regulated by the SEC are subject to an affirmative obligation to make "fair and orderly markets." In return for accepting this obligation, they are granted certain benefits, such as ready access to order flow and information advantages. Financial economists have long been skeptical of the efficacy of a legal requirement to "do good," and have found little, if any, evidence that the requirement contributes to the quality of markets. As electronic communications increase competition across trading systems, the ability to impose an affirmative obligation declines. Market makers are reluctant to stabilize markets at a loss to themselves when competition limits their ability to capture their designated benefits. In addition, as more liquidity is provided directly by electronic delivery of customer orders, the need for market makers declines.

97-18 "A Study of Initial Returns to Mutual Thrift Conversion to Stock Charter," by ***Ronald W. Masulis****. (October 9, 1996)*

This study compares stock issues of initial public offerings (IPOs) and thrift conversions. We find that nearly 600 thrift conversions occur over the 1980-1994 period. Compared to IPOs, stocks of thrift conversions are less risky, have average offering size which tended to be larger in early years and smaller in more recent years. Initial returns of IPOs and thrift conversions appear similar in the early 1980s. However, in the mid 1980s through the mid 1990s, investment in primary offerings of thrift conversions appear to be more profitable. Controlling for significant differences in issue characteristics between the IPO and thrift conversion samples, initial returns of thrift conversions exceed those of IPOs by approximately 10%. This appears to reflect problems with the federally mandated mutual thrift appraisal process. The appraisal guidelines were revised in 1994 to lessen the likelihood of high initial returns to conversions. Substantially lower average initial returns in 1994 appear to bear out the effectiveness of this revision in the appraisal process.

97-19 "Does the Market Value Environmental Performance?" by Shameek Konar and ***Mark A. Cohen****. (May 1997)*

Previous studies that attempt to relate environmental to financial performance have often led to conflicting results due to small samples and subjective environmental performance criteria. We report on a study that relates the market value of firms in the S&P 500 to objective measures of their environmental performance. After controlling for variables traditionally thought to explain firm level financial performance, we find that bad environmental performance has a significant negative effect on the intangible asset value of firms. The average "intangible liability" for firms in our sample is 360 million dollars - approximately 8.4% of the replacement value of tangible assets. We conclude that legally emitted toxic chemicals have a significant effect on the intangible asset value of publicly traded companies. A 10% reduction in emissions of toxic chemicals results in a $31 million increase in market value. The magnitude of these effects varies across industries, with larger losses accruing to the traditionally polluting industries.

97-20 "Why Do Firms Pollute (and Reduce) Toxic Emissions?" by Shameek Konar and ***Mark A. Cohen****. (March 1997)*

There is a growing trend in both the U.S. and abroad for firms to reduce emission levels beyond the legally required mandate. One of the most publicized examples of this phenomenon in the U.S. is the release of toxic chemicals. These emissions have come under increasing scrutiny since passage of the "Right-to-Know" law mandating the public availability of toxic release inventory (TRI) information beginning in 1989. In response to this new information, some firms have dramatically reduced toxic chemical emissions. This paper explores the factors that both explain differences across firms in their initial toxic emission levels and in the reductions beyond any legally required levels subsequent to the availability of public information on TRI. The underlying theory is that firm-level pollution varies because of firm-specific factors that affect both the "ability" and "incentive" for firms to reduce pollution. In comparing emission levels between 1989 and 1992, we find that the largest firms are most likely to reduce emissions subsequent to this new information being made public. We also find that financial ability plays an important role in emission levels. On the other hand, we were unable to find any evidence that firms who advertise more heavily to consumers or had significant negative media attention concerning their emission levels reduced their emissions more than average after controlling for firm size.

97-21 "Intraday Market Response to Equity Offering Announcements: A NYSE/AMEX-NASDAQ Comparison," by ***Ronald W. Masulis*** *and L. Shivakumar. (June 27, 1997)*

This study compares the speed of price adjustment for stocks on the NYSE/AMEX with the speed on NASDAQ to seasoned equity offering announcements using transactions data. We find that NASDAQ stocks react faster to equity offering announcements than NYSE/AMEX stocks. The faster NASDAQ response is surprising given that these stocks are less frequently traded and have smaller equity capitalization than the NYSE/AMEX stocks. Further analysis suggests that the faster reaction of NASDAQ stocks is due to a faster response to information by traders and dealers on NASDAQ and due to the existence of stale limit orders slowing the observed price reaction on the NYSE/AMEX. In addition, consistent with NYSE/AMEX specialists bearing greater adverse selection risk from market making, these stocks exhibit larger average bid-ask spread reactions to equity offering announcements than do NASDAQ stocks, which appears to be a further cause of the slow price reactions of NYSE/AMEX stocks to new information. ■

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