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FINANCIAL MARKETS RESEARCH CENTER • 1994

Global Risk Conference

In the spring of 1994, well-publicized derivatives losses by Proctor and Gamble, Gibson Greeting Cards, and others focused renewed attention on over-the-counter derivatives sold by banks and brokers. The Group of 30's comprehensive report, "Derivatives: Practices and Principles," had appeared in July of 1993, and market observers were anxiously awaiting the GAA report on financial derivatives which ultimately made its appearance in May of 1994.

In this environment, the Financial Markets Research Center sponsored a conference on Global Risk Management and Regulatory Policy, its second conference in a row on this general topic. The conference brought together academics, industry practitioners, and government regulators to discuss the risks of and appropriate regulatory policy toward derivatives. The conference was funded by the Financial Markets Research Center with the help of a special grant from the Chicago Board Options Exchange, a Center member.

The first session of the conference, "Derivatives and Bank Risk Management," chaired by Kathleen Condon, managing director of Bankers Trust, provided a description of the setting in which derivatives are currently used. David Brunner, director of Paribas Capital Markets and co-chairman of the working group for the G-30 derivatives study, discussed some of the key findings of the Group of 30 study. The study's purpose was to describe the use of derivatives, to demystify them, and to provide guidelines for good business



Kathleen Condon, Managing Director at Bankers Trust, introduces the panel on derivatives and bank risk management.

practice in the use of derivatives. The Group of 30 Report recommends that firms set clear policies and makes recommendations for measuring, controlling, and disclosing derivatives positions and risks. Brunner emphasized the need to define risk, not in terms of particular financial products but in terms of the ultimate source of risk - interest rates, currencies, equities, commodities, or other.

He also stressed the importance for both market risk exposure and credit risk exposure of (1) marking to market derivatives positions at least daily, (2) measuring the future potential risk of loss in those positions, and (3) stress testing those positions for unexpected changes in underlying circumstances.

Steven Kohlhagen, senior vice president at First Union National Bank, spoke on that bank's derivatives activities. The bank has been an active user of derivatives for the past eight years and is currently marketing derivatives as risk managing tools to middle market and larger firms. Kohlhagen stressed that his main task is to "listen to his customers' needs." Doug Harris, senior policy advisor at the Comptroller of the Currency, spoke briefly about suitability requirements and discussed in more detail new requirements for greater disclosure by banks of their derivatives activities and positions. He stressed the need for such information to carry out bank regulators' oversight responsibilities.

In addition to regulatory oversight, appropriate



David Brunner, Director of Paribas Capital Markets, explains good risk management principles.

FROM THE DIRECTOR

Financial markets - mysterious, exciting, and somewhat dangerous - continue to tickle the fancy of the general public and Congress. Some well publicized losses in derivatives have kept this subject in the headlines and in front of Congressional committees. Behind the



Hans R. Stoll

headlines lie important issues for regulators and business executives. One of the functions of the Financial Markets Research Center is to demystify markets and to improve understanding of their purpose and functioning through rigorous analysis. Toward that end, the Center held a conference on Global Risk Management and Regulatory Policy, which is described in greater detail elsewhere in this newsletter. Research associates of the Center are investigating various aspects of the overall issue, including questions of stochastic volatility, the role of margins, and the performance of bank risk assessment and risk management systems.

During the past year, the Securities and Exchange Commission released its Market 2000 Report in which it assessed the structure and functioning of the equity markets and proposed a number of changes. Center faculty have worked on a variety of issues examined in the report, including the appropriate structure of markets and the

cost of trading in different markets. A recent paper by Bill Christie (with Paul Schultz) showing the infrequent use of odd eighths in the NASDAQ dealer market bears on some of the issues raised in the SEC 2000 report, particularly the question of appropriate tick size. The Christie/Schultz study, which concluded that the absence of odd eighths also implied wider spreads than would otherwise be the case, has generated tremendous interest in the press.

The Center's research on these and other topics is supported by its members and by outside research grants. Center members currently number twelve. The newest member joining the Financial Markets Research Center during the past year is the International Advisory Group, Inc. (IAG). IAG is a Nashville based company that compiles authoritative information on hedge funds and advises investors in hedge funds. Center members provide funding for data bases, computer programming support, and summer research grants for faculty. The support of its members makes it possible for the Financial Markets Research Center to provide the intellectual and analytical underpinnings for understanding the rapid developments in financial markets.

The activities of the Center's associated faculty and their recent research work are detailed later in this letter. Center associates have given talks at universities and conferences around the world and have conducted research on topics such as exchange rate behavior, cross correlation of stock returns, stock return dynamics in London, and convertible debt. ■

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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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:

Bankers Trust Company
J. C. Bradford & Company
The Chicago Board Options Exchange
The Chicago Mercantile Exchange
Hull Trading Company
International Advisory Group, Inc.
The National Association of Securities Dealers
The New York Stock Exchange, Inc.
Refco Group, Ltd.
Savings & Community Bankers of America
Timber Hill Incorporated
Tudor Investment Corporation

Global Risk Conference *(continued)*



Doug Harris, Senior Policy Advisor, Comptroller of the Currency, discusses regulatory policy towards banks.

capital standards can limit the risk of derivatives. The second session on Thursday morning, chaired by Duke Chapman, chairman of the Chicago Board Options Exchange, examined this and related issues. Roger Coffin, branch chief of the Division of

Market Regulation at the Securities and Exchange Commission, discussed the SEC's capital standards towards broker-dealers. He noted that the SEC's 100 percent haircut on unsecured receivables made it virtually impossible for SEC regulated broker-dealers to carry out derivatives business that involves credit risk. As a result, SEC regulated firms have established AAA subsidiaries to do non-securities derivatives business outside the regulated broker-dealer. He noted that the SEC is in the process of developing new capital standards, a process initiated with its May 1993 concept release on the subject. Regulatory monitoring of broker-dealers derivative activities also depends on adequate information. Coffin discussed the risk assessment and reporting rules implemented in 1992. These rules require that material affiliated persons of broker-dealers report detailed information on their derivative positions to the SEC. He also described a number of cooperative efforts undertaken by the CFTC, the SEC, and Britain's SIB in overseeing derivatives activities.

Dan Mudge, who heads risk management at Bankers Trust, discussed the market risk capital standards issued in April 1993 by the Basle Bank for International Settlements Committee on Banking Supervision. Mudge supported the BIS goal of a uniform, worldwide approach

to capital standards that is based on economic value rather than accounting classification. Mudge criticized the BIS approach for focusing on products rather than on underlying risks and for failure to adopt a portfolio approach to capital standards. Warren Langley, partner at Hull Trading Company, commented on the capital standard issue by describing an intermarket arbitrage between a long position in NASDAQ index options and a short position in individual NASDAQ stocks which imposed excessive capital requirements on the firm.

In addition to regulatory oversight and capital standards, a third approach to the risks of derivatives is public disclosure of firms' derivative activities. The first session after lunch, chaired by Bucky Isaacson, a consultant on managed futures and vice president of Lind Waldock and Company, dealt with accounting disclosure of derivatives activities. Halsey Bullen, project manager at the Financial Accounting Standards Board in charge of their project on the disclosure of derivative activities, spoke on accounting for derivatives. He described the patchwork of accounting standards that have been established for off-balance sheet risk, for fair value of financial instruments, for hedge accounting (e.g., foreign currency hedge accounting under Statement 52), and for market value reporting (Statement 115). He then described the current activities at the FASB that aim at developing before the end of 1994 an improved FASB financial reporting standard with respect to derivatives. Paul Knudsvig, vice president at Alliance Capital Management Corporation, commented on some of the difficulties posed by current FASB standards.

Thursday's final session, a panel discussion on OTC derivatives and bank regulation, was chaired by Sir Jeremy Morse, former chairman of Lloyds Bank, London, and an articulate observer of the world

scene. When asked whether the young rocket scientists and math nerds creating new derivative instruments knew what they were doing, Sir Jeremy's response was that it is always so with new inventions: "The young are ahead of their managers, who are ahead of the regulators, who are ahead of the auditors, who are ahead of the lawyers." Robert Litan, currently at the Department of Justice on leave from the Brookings Institution and a frequent writer on financial institutions, discussed a fourth approach to the risk of derivatives, the narrow bank. One interpretation of the narrow bank is that it would narrow the assets eligible to back up insured deposits, thereby protecting the deposit insurance fund. Bob Eisenbeis, professor of finance at the University of North Carolina, argued that the narrow bank was not workable and was unnecessary. He argued that the deposit insurance fund and the banking system in general can be protected from the risk of financial derivatives if financial institutions that are in trouble are shut down before their equity becomes negative. This requires accurate information on the market value of the institution. Hermann Schulte-Mattler, formerly at the Association of German Banks and currently a professor at the University of Dortmund, discussed derivative activities of German banks and the regulation of bank derivative activities in the European community and in Germany.

Pat Parkinson, assistant director at the Federal Reserve Board's Division of Research and Statistics, focused on the Fed's interest in (a) promoting sound risk management at banks and (b) strengthening the institutional environment for derivatives activities. He noted that the Group of 30 Report provided excellent guidelines for sound risk management and that the Fed's on-site examinations were important to understanding and facilitating sound risk management. With regard to strengthening the institutional environment, he focused on the need to eliminate legal uncertainty, for example with regard to the legality of counterparty netting of obligations, particularly internationally. He also noted the desirability of strengthening the payments and settlement



Duke Chapman, Chairman of the Chicago Board Options Exchange, points to the rise in options trading.



Sir Jeremy Morse, retired Chairman of Lloyds Bank, introduces the panel on regulatory policy towards banks.

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Global Risk Conference *(continued)*



Peter Borish, Director of Research at Tudor Investment Corp., comments on developments in derivative markets.

system and, perhaps, developing a clearing arrangement for over-the-counter derivatives instruments.

Thursday ended with dinner and a show on the General Jackson Riverboat, an event at which all had a good time and at which many weighty matters were discussed.

Friday morning's opening session on risk and margins was chaired by Rick Kilcollin, chief operating officer at the Chicago Mercantile Exchange. Michel Crouhy, professor at the HEC School of Management in Paris, spoke on modeling volatility and managing the hedge. He analyzed the problem of optimal hedging strategy when the delta of an option is known to change as a function of certain other parameters. Paul Kupiec, economist at the Federal Reserve Board, next spoke on the performance of the SPAN Margining System. The SPAN system sets margin requirements on a portfolio basis for customers, clearing members, and market

maker accounts. Kupiec's analysis of the system in the years 1988 through 1992 indicated that the SPAN clearing house margining requirements provided coverage that exceeded 99 percent of all one-day price moves experienced by naked futures and naked futures options positions.

The last session of the conference was chaired by Peter Borish, director of research at Tudor Investment Corporation. Among his other activities, Borish has been instrumental in establishing the Futures Industry Institute, which collects and disseminates futures market data. The session dealt with research in German financial markets. In the last few years, German financial markets have undergone the most dramatic change of any of the European markets. Hermann Goepl, professor at the University of Karlsruhe, spoke on the data bases and research programs taking place in Germany. The University of Karlsruhe has taken on the task of developing historical data bases for stock, bond, and futures prices and returns. Christian Schlag, assistant professor at the University of Karlsruhe, presented research on trading costs in the DAX stock index options traded on the German futures exchange, the DTB. ■

Finance Student Activities



Peter Peterson, Chairman of the Blackstone Group, flanked by Lee Landrum and Michael Cavanaugh, after receiving the Owen Finance Association's Financial Executive of the Year award.

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 Peter G. Peterson, Chairman of the Blackstone Group, was selected as 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. ■



Daane Invitational Tennis Tournament

As has become the custom at the Financial Markets Research Center Conference, Dewey Daane hosted his Daane Invitational Tennis Tournament. The contents of the Daane Cup went to Craig Lewis (on the right), whose serve overwhelmed the opposition, and to Todd Petzel (for the second time in three years). Daane announced that Lewis would be his partner at the next tournament.

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 1993-94 academic year were:

Stephen H. Axilrod, vice chairman,
Nikko Securities

Roger E. Brinner, group vice-president and executive research director, *DRI/McGraw Hill*

Elaine Chao, president, *United Way of America*

Robert Cizik, chairman and chief executive officer, *Cooper Industries*

Kathleen B. Cooper, chief economist,
Exxon

Robert P. Forrestal, president,
Federal Reserve Bank of Atlanta

John G. Heimann, chairman,
Global Financial Institutions,
Merrill Lynch and Company

Thomas M. Hoenig, president,
Federal Reserve Bank of Kansas City

Robert C. Holland, consultant
(former president) *Committee for Economic Development*; Senior Fellow in Business Ethics, *The Wharton School*; former member, *Board of Governors of the Federal Reserve System*

David M. Jones, executive vice president and chief economist, *Aubrey G. Lanston & Co.*

Silas Keehn, president,
Federal Reserve Bank of Chicago

Edward W. Kelley, Jr., member,
Board of Governors of the Federal Reserve System

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

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

David A. Lereah, chief economist and staff vice president, *Mortgage Bankers Association of America*

Robert Nourse, president and chief executive officer, *The Bombay Co., Inc.*

Scott E. Pardee, chairman,
Yamaichi International (America) Inc.

Peter G. Peterson, chairman,
Blackstone Group

Carol Cox Wait, president,
Committee for a Responsible Budget

Arthur Walsh, non-executive chairman, *National Telecommunications Group, Ltd.* and *Telemetrix (U.K.)*; non-executive chairman, *GTI Corporation of San Diego*

Yotaro Kobayashi, chairman and chief executive officer, *Fuji Xerox* ■

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 1993-94 the following researchers presented work on finance topics:

Seema Arora, *UCLA*: "An Experiment in Voluntary Environmental Regulation: Participation in EPA's 33/50 Program"

Marguerite Bishop, *Northwestern*: "Managing Bank Regulation Through Accruals"

Christine Botosan, *Michigan*: "The Impact of Annual Report Disclosure Level on Investor Base and the Cost of Equity Capital"

Wolfgang Bühler, *Mannheim (UCLA)*: "The Value of the Early Unwind Option in Futures Contracts with an Endogenous Basis"

Myeong-Hyeon Cho, *Cornell*: "The Role of International Acquisitions and Joint Ventures in Global Strategy: Investment Under Uncertainty"

Tarun Chordia, *Owen School*: "Speed of Adjustment and Cross Correlations in Stock Returns"

William G. Christie, *Owen School*: "Why Do Nasdaq Market Makers Avoid Odd-Eighth Quotes?"

Michele Daley, *Rochester*: "The Impact of Deferred Tax Allocation on Earnings as a Measure of Firm Performance"

Julia D'Souza, *Northwestern*: "Rate-Regulated Enterprises and Mandated Accounting Changes: The Responses of Electric Utilities to SFAS 106"

Bernard Dumas, *HEC*: "How Far Apart Can Two Riskless Interest Rates Be?"

Stuart Gilson, *Harvard*: "Debt Reduction, Optimal Capital Structure, and Renegotiation of Claims During Financial Distress"

Carol Goldberg, *Carnegie Mellon*: "Modeling the New Federalism: Federal-State Interaction in Environmental Control"

Chris Hogan, *Ohio State*: "The Market for Audit Services When Firms Go Public"

Roger D. Huang, *Owen School*: "Anatomy of Trading Costs: Evidence from the NYSE"

Michael Melvin, *Arizona State*: "Bid-Ask Spreads and Volatility in the Foreign

Exchange Market: An Empirical Analysis"

Rafi Mohammed, *Cornell*: "The Role of Mixed Bundling in Increasing Market Uncertainty: Theory and Evidence from the Entertainment Industry"

Kevin Murphy, *Harvard*: "State Pension Funds and Shareholder Inactivism"

Rick Simpson, *Vanderbilt*: "The Supply of Immediacy and the Cost of Adverse Selection"

Erik Sirri, *Harvard*: "Buying and Selling Mutual Funds: Flows, Performance, Fees, and Services"

Karen A. Smith, *Arizona State*: "Auditors' Business Risk and Modified Audit Reports"

René Stulz, *Ohio State*: "How Different is Japanese Corporate Finance: An Investigation of the Information Content of New Security Issue"

Kent Womak, *Cornell*: "Do Brokerage Analysts' Recommendations Have Investment Value?" ■

Current Activities of Center Faculty

CLIFFORD A. 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; EMS currency options; 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.

In February 1994, Ball participated in the Federal Reserve conference on derivatives held in Miami, Florida. In June he presented his paper, "Unit Roots and the estimation of Interest Rate Dynamics," at the Western Finance Association annual meetings in Santa Fe, New Mexico. His paper, "Target Zone Modelling and Estimation for European Monetary System Exchange Rates," (with Antonio Roma) appeared in the June issue of the *Journal of Empirical 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.

Conducts research on the economic consequences and capital-market effects of accounting information.



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

Chordia joined the Owen faculty last summer after completing his Ph.D. in Finance at UCLA. He has a Masters in Chemical Engineering and an MBA from Tulane University. Prior to his doctoral studies, he worked for Citibank, Bombay as a relationship and credit manager in the Financial Institutions Group. His research interests include financial institutions, corporate finance, and market micro-structure.

Chordia's paper, "Brokerage Commission Schedules," (with Michael Brennan) appeared in the September 1993 issue of the *Journal of Finance*. He presented his papers, "The Structure of Mutual Fund Charges," at the Wharton conference on Closed-End Fund Discounts in December and, "Market Making, the Tick Size and Payment for Order Flow: Theory and Evidence," (with Avanidhar Subrahmanyam) at the annual AFA meetings in January. He was a discussant at the 1994 WFA meetings in Santa Fe in June and has helped organize a session on Bid-Ask Spreads for the forthcoming FMA meetings.

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

Conducts research in corporate finance and the structure of trading costs for equity traded in different market structures. His current research interests include the provision of liquidity during unusual price movements, and the importance of economic versus regulatory factors in determining bid-ask spreads.

He recently had two papers appear in print. "Market Structure and Liquidity: A Transactions Data Study of Exchange Listings" (with Roger D. Huang) appeared in the *Journal of Financial Intermediation*, while "The Changing Functional Relation



between Stock Returns and Dividend Yields" (with Roger D. Huang) was published in the *Journal of Empirical Finance*. He also had four papers accepted for publication, including "Why Do NASDAQ Market Makers Avoid Odd-Eighth Quotes?" (with Paul H. Schultz), forthcoming in the *Journal of Finance*, "Free Cash Flow, Shareholder Value, and the Undistributed Profits Tax of 1936-37" (with Vikram Nanda), also forthcoming in the *Journal of Finance*, "Are Dividend Omissions Truly the Cruellest Cut of All," forthcoming in the *Journal of Financial and Quantitative Analysis*, and "Market Structure and the Intraday Pattern of Bid-Ask Spreads for NASDAQ Securities" (with K.C. Chan and Paul H. Schultz), forthcoming in the *Journal of Business*.



Christie's conference participation included presenting "Market Structure and Liquidity: A Transactions Data Study of Exchange Listings" at the 1994 meetings of the Southwestern Finance Association, where the paper was awarded the Irwin Distinguished Paper Award. He also participated in the USC/UCLA/NYSE Market Microstructure Symposium where "Market Structure and Liquidity: A Transactions Data Study of Exchange Listings" and "Why Do NASDAQ Market Makers Avoid Odd-Eighth Quotes?" were presented. In addition, he and Paul Schultz were invited to address the Society of Quantitative Analysts in New York in September 1994.

Christie teaches the core and the advanced corporate finance class in the regular M.B.A. program, and the core finance course in the Executive M.B.A. program. He was awarded the James A. Webb, Jr. Award for Excellence in Teaching and the Executive M.B.A. Program's Outstanding Professor Award in 1994.

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. 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*.



During the past year, Cohen presented his papers, "Why Do Corporations Become Criminals?" (with Cindy Alexander) at Harvard University Law School and "Is There Life After Crime?" (with Cindy Alexander), at the American Law and Economics Association annual meetings at Stanford University. He also attended the annual meeting of the Committee on Law and Justice of the American Statistical Association in Washington, DC, in May and the annual meeting of the European Association of Environmental and Resource Economists in Dublin, Ireland, in June. In August, Cohen attended the Business-Environment Learning and Leadership Conference sponsored by the Management Institute for Environment and Business at Northwestern University.

Cohen was awarded the Dean's Teaching Award for developing new courses and emphasis in environmental management education.

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 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.

During the past year Daane participated in the 30th Annual Conference on Banking Structure and Regulation sponsored by the Federal Reserve Bank of Chicago, the 18th annual economic symposium on public issues sponsored by the Federal Reserve Bank of Kansas City in Jackson Hole, Wyoming, and the annual meetings of the International Monetary Fund and World Bank in Washington, D.C. He is a regular respondent to the *Wall Street Journal* semi-annual economic surveys and to the quarterly *USA Today* surveys.

He taught seminars in Monetary Policy in Theory and Practice and Current Problems in Economic Policy at Middlebury College in Vermont during the fall of 1991 and 1992, and, during the past year, he co-edited a book with David C. Colander, *The Art of Monetary Policy*, comprised of essays by experts who participated in those seminars. He is currently engaged in writing a history of Equitable Securities Corporation, Nashville, Tennessee.



LUKE M. FROEB, assistant professor (economics). Ph.D. (Wisconsin, 1983).

Before joining the faculty at Owen, Froeb worked at the Antitrust Division of the U.S. Department of Justice. There he worked on merger, price-fixing, bid-rigging, and discrimination cases as a consultant and expert witness. He previously taught at Tulane University and in 1989, was named Kramer Foundation Fellow



to the University of Chicago.

Froeb's research interests fall into three different fields: time series econometrics,

industrial organization, and economics. Currently he is working on statistical tests for volatility in asset markets; using computer simulation as a way of predicting the effects of mergers; and studying the role that expert witnesses play in our adversarial system of justice.

Froeb's writings have appeared in the *Journal of Econometrics*, the *Journal of Industrial Economics*, and the *Journal of Law, Economics, and Organization*, among others.

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

Current research focuses on price behavior in financial markets. Huang is studying the costs of executing trades under alternative market structures, dealer competition in foreign exchange markets, the relation between oil and financial markets, and the impact of open market operations on the financial markets.

Huang has just returned from MIT where he spent an academic year as a Visiting Professor of Finance. During the spring and summer of 1993, three of his papers were published. "Market Structures and Liquidity: A Transactions Data Study of Exchange Listings" (with William G. Christie) was published in the



Journal of Financial Intermediation, "Market Microstructure and Stock Return Predictions" (with Hans R. Stoll) was published in the *Review of Financial Studies*, and "The Changing Functional Relation Between Stock Returns and dividend Yields" (with William G. Christie) was published in the *Journal of Empirical Finance*. His paper, "Data Frequency and the Number of Factors in Stock Returns, (with Hoje Jo) is forthcoming in the *Journal of Banking and Finance*.

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

Conducts research on corporate financial policy, accounting earnings management, futures, and options.

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Current research topics include the time series behavior of volatility, margin policy, convertible debt policy, and earnings management.

Published papers by Lewis include the information content of implied volatilities from stock index options, multiperiod corporate financial policy choices, the valuation of convertible debt, and recapitalization. His paper, "Forecasting Futures Market Volatility," (with Theodore E. Day) appeared in the winter issue of the *Journal of Derivatives*, and another paper, "Earnings Management and Firm Valuation under Asymmetric Information Content," (with Paul Chaney) has been accepted for publication in the *Journal of Corporate Finance: Contracting, Governance, and Organization*.

Lewis discussed a paper at the Western Finance Association meetings in Santa Fe in June. He also 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 most recently 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*.

In April he presented his paper (with Victor Ng), "Overnight and Daytime Stock Return Dynamics on the London Stock exchange: The Impact of 'Big Bang'," at the University of Iowa and at Queens University, Kingston, Ontario. He served on the program committee of the Western Finance Association and chaired a session on Stock Price Reactions at the annual meetings in Santa Fe, New Mexico, in June.

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.



Conducts research on the effects of exchange rates on price levels, convergence toward Purchasing Power Parity, and the effects of inflation on relative prices.

Parsley presented two papers, "Inflation and Relative Price Variability: Evidence from a New Data Set" and "Purchasing Power Parity with Fixed Nominal Exchange Rates: Commodity Level Evidence from the United States" (with Shang-Jin Wei) at the American Economics Association annual meetings in January. In May he attended the faculty development seminar, Business in a European Context, hosted by the University of Antwerp. His paper, "Insignificant and Inconsequential Hysteresis: The Case of U.S. Bilateral Trade," was published in the *Review of Economics and Statistics*, and another paper, "Exchange Rate Uncertainty and Traded Goods Prices," (with Ziyong Cai) was accepted for publication in the *International Economic Journal*.

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

Conducts research on Business strategy, marketing, pricing, regulation, antitrust, and industrial organization. Current research topics include strategies in the electric power industry, new product development, brand name extensions, and vertical alliances in the telecommunications industry.



During the past year, Scheffman published papers on the future of management structure and the economics of mergers. He edited and contributed to a special two-volume edition of the *Antitrust Bulletin* on merger policy. He is organizing a conference on the economics of the "new purchasing," which will be held at Owen in the summer of 1995. Scheffman's consulting projects during the summer involved pricing, distribution, and strategic alliances.

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

Current research interests include the measurement of transactions costs, the efficiency of dealer versus auction markets, and risk management.

During the fall of 1993, Stoll participated in a number of conferences, including the Fourth Annual Conference on Financial Economics and Accounting at Washington University in October, a conference on Global Equity Markets at NYU in October, a conference on Global Competition in the Market for Markets at Duke University in November, and a conference on Financial Innovation: 20 Years of Black/Scholes and Merton, also at Duke University, in late November.

Stoll continues as a member of the



Shadow Securities and Exchange Commission which met on November 15-16 in Washington, DC to discuss market structure issues likely to be raised by the then not-yet-published Market 2000 Report of the Securities and Exchange Commission and to discuss the accounting procedures for executive stock options. In December 1993, Stoll was elected to a two-year term as public director of the Futures Industry Association. The Futures Industry Association is a trade association based in Washington, DC, that represents the views of firms that have interests in futures and options markets.

On February 18, 1994, Stoll presented the paper, "Market Microstructure and Stock Return Predictions," (with Roger Huang) at Georgetown University. At the end of February, he traveled to Hong Kong where he was invited to speak on derivatives and to meet with various government regulators and exchange officials. On March 8, he participated in a panel on Market 2000 Recommendations at the Securities Industry Institute held at the Wharton School. On March 17, he presented the paper, "Anatomy of Trading Costs: Evidence from the New York Stock Exchange," at a conference on The Competition for Order Flow at Memphis State University. On March 17, he chaired a panel on Opportunities in Emerging Markets at the Futures Industry

Association annual meetings in Boca Raton, Florida. Stoll spoke at a conference, What Do Institutions Expect from Brokers and Markets at the Dawn of the 21st Century?, held at Pace University in New York City on April 13. He spoke on derivatives at a Robert Morris Associates bankers conference held at Opryland on April 16 and at an Owen School Associates breakfast in June. He chaired a session on Market Structure and Contract Design at the FIA international conference held on May 23-24 in London, England. He also gave a research seminar at the London Business School. On June 30, Stoll spoke on "Risk and Return in Managed Futures" at a Managed Futures Conference in New York City.

Stoll's paper (with Roger Huang), "Market Microstructure and Stock Return Predictions," appeared in the spring issue of the *Review of Financial Studies*, and his paper, "The Importance of Equity Trading Costs: Evidence from Securities Firms' Revenues," is forthcoming in a book entitled *Global Equity Markets: Technological, Competitive and Regulatory Challenges*. Stoll continues to serve on the editorial boards of eight finance journals.

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

Chicago, MIT, and Rochester. 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.



JIAWEN YANG, assistant professor (economics and finance). M.A. (University of International Business & Economics, Beijing, China, 1984), Ph.D. (NYU, 1993).



Yang was visiting professor at Owen during the 1993-94 academic year, having taught previously at NYU. In the fall of 1994, he moves to George

Washington University where he will begin teaching in the international business department. ■

Faculty Research Papers

Current working papers completed or revised since January 1993 are listed below. Individual copies may be obtained by writing Mrs. Pat Scott, Owen Graduate School of Management, Vanderbilt University, Nashville, TN 37203.

91-10 "Public Information and Fixed Income Volatility," by Campbell R. Harvey and Roger D. Huang. (July 1993)

This paper analyzes the link between public information and price volatility in the short-term fixed income market. Our results indicate that the high market volatility observed at the opening of trading on the Eurodollar and Treasury bill futures contracts in the U.S. is due to U.S. macroeconomic announcements. When specific news releases are studied, we find that volatility is positively correlated with the magnitude of the surprise and is higher for bad

news than for good news. We also conduct a detailed examination of the specific Fed actions and their market effects during the crash of October 1987.

91-12 "An Analysis of Nonlinearities in Term Premiums and Forward Rates," by Roger D. Huang and Charles S.Y. Lin. (May 1993)

Previous studies often assume a linear relation between term premiums on Treasury securities and forward interest rates, although a nonlinear relation is a theoretical and an empirical possibility. To circumvent specification problems, this paper uses a nonparametric kernel approach that permits both linear and nonlinear relations. Although the linear specification that is consistent with the term structure models of Cox, Ingersoll, and Ross and others appears to be robust, we uncover evidence that expected term premiums and their sensitivities

to forward premiums vary through time. Kernel regression models also generate humped term structures of expected term premiums that appear to move systematically with the business cycle.

91-13 "Measuring the Impacts of Dividend Capture Trading: A Market Microstructure Analysis," Hyuk Choe and Ronald W. Masulis. (March 1993)

This study examines transactions data around cash dividend distributions by NYSE and AMEX listed common stocks for several separate tax regimes associated with years 1985, 1986 and 1988. Evidence of abnormally large and frequent purchase orders preceding the ex-date and abnormally large and frequent sell orders on the ex-date is uncovered. Shifts in specialists' bid-ask quotes and spreads are also

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found. The results are insensitive to measurement based on hourly sampling or transaction by transaction sampling. A significant increase in dividend capture activity is found in the 1988 period. Biases in returns calculated from transaction prices as well as returns based on cum- and ex-date closing prices are documented.

91-15 "An Empirical Analysis of Earnings Management: Evidence from Initial Public Offerings," by Paul K. Chaney and Craig M. Lewis. (July 1993)

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. Firms that perform well tend to report earnings with less variability relative to cash from operations; while firms that perform poorly tend to report earnings that increase earnings variability relative to cash from operations. 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 is better able to assess the information content of earnings for firms with smoother earnings.

91-64 "Unit Roots and the Estimation of Interest Rate Dynamics," by Clifford A. Ball and Walter N. Torous. (June 6, 1994)

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.

91-70 "Data Frequency and the Number of Factors in Stock Returns," by Roger D. Huang and Hoje Jo. (Forthcoming in *Journal of Banking and Finance*)

Determining the number of factors that explain stock returns plays an important role in empirical tests of the Arbitrage Pricing Theory. This paper examines the sensitivity of the number of factors to different data frequencies using daily, weekly, and monthly returns. The empirical results are consistent with the null hypothesis that the number of factors is the same for different data frequencies once daily returns are adjusted for nonsynchronous trading. The evidence also identifies only one or two factors.

92-04 *Free Cash Flow, Shareholder Value, and the Undistributed Profits Tax of 1936-37*," by William G. Christie and Vikram Nanda. (Forthcoming in *The Journal of Finance*)

In 1936, the Federal Government unexpectedly imposed a tax on undistributed corporate profits. Despite the direct costs of the tax, its announcement produced a positive revaluation of corporate equity, particularly among lower payout firms. We interpret this as evidence of a divergence between managerial and shareholder preferences regarding dividend payout policies, consistent with the presence of agency costs. We also find that despite the incentives created by the tax, the actual growth in dividends during 1936 was lower among firms judged more likely to be subject to higher agency costs after controlling for liquidity, debt, and the growth in earnings.

92-05 "Are Dividend Omissions Truly the Cruellest Cut of All?" by William G. Christie. (Forthcoming in *Journal of Financial and Quantitative Analysis*)

Signaling and agency cost theories of dividend policy predict that omissions will produce a larger average decline in equity values than will reductions of less than 100%. However, this paper identifies a U-shaped relation between announcement day risk-adjusted excess returns and the percentage decline in dividends. The significantly smaller than expected price reaction to dividend omissions cannot be traced to growth opportunities, nor to a tendency for firms to delay omission announcements. While omitting firms provide higher per-share dividends within 5 years of the dividend action than do firms that severely reduce payments, future dividends are unrelated to the market's response.

92-18 "Why Do Corporations Become Criminals?" by Cindy Alexander and Mark A. Cohen. (July 1994)

This paper presents empirical evidence on why firms become corporate criminals. We compare ownership structures of firms convicted of federal crimes with those of firms not charged with wrong-doing. This comparison permits us to test the extent to which (i) shareholders tend to benefit from or be harmed by corporate crime and (ii) firms' top-level ownership and control structures affect behavior throughout the firm. The evidence is that ownership structure does influence the crime rate, as top managements of criminal firms tend to own less equity in their companies than do top managements of firms not charged with crime. Further analysis of the ownership structures of criminal firms supports this finding. This suggests that the expected overall cost to shareholders from inframarginal corporate criminal wrong-doing tends to exceed the gains that shareholders expect to receive. Put differently, crime does not "pay" from the shareholders' perspective. Our findings suggest that crimes by corporate employees are not random events beyond top management (and ultimately shareholder) control. Crime can be deterred by placing penalties on shareholders—not just on guilty employees.

92-25 "Exchange Rate Uncertainty and Traded Goods Prices," by David C. Parsley and Ziyong Cai. (Forthcoming in *International Economic Journal*)

This paper studies the effects of exchange rate uncertainty on prices in an intertemporal context. That is, we focus on trade-offs between current and expected future volatility. We show that uncertainty matters even to risk neutral firms due to its effects on bid/ask spreads in foreign exchange. However, due to intertemporal considerations, firms may choose not to pass through increases in volatility to prices. Moreover, ignoring these intertemporal considerations in empirical analyses will generally bias the resulting ordinary least squares estimates of the effects of uncertainty.

92-32 "Initial Margin Policy and Stochastic Volatility in the Crude Oil Futures Market," by Theodore E. Day and Craig M. Lewis. (November 1993)

Dramatic short-run increases in the volatility of financial markets, such as the extraordinary volatility following the stock market decline in October 1987, have renewed interest in the relation between initial margin requirements and stock market volatility. We extend previous research on the nature of the

relation between initial margin requirements and the volatility of markets by examining the behavior of the implied volatilities from call options on crude oil futures contracts under the assumption that volatility is stochastic. The spot volatilities implicit in the prices of crude oil futures options provide direct evidence concerning the ex ante effect of margin changes. Previous research examines ex post effects.

92-37 "Market Structure and the Intraday Pattern of Bid-Ask Spreads for NASDAQ Securities," by K.C. Chan, William G. Christie, and Paul H. Schultz. (Forthcoming in the *Journal of Business*)

This paper examines the intraday pattern of bid-ask spreads for two samples of Nasdaq stocks. We find that, in contrast to the U-shaped pattern for NYSE stocks reported by Brock and Kleidon (1992) and McNish and Wood (1992), the bid-ask spread for Nasdaq securities is relatively stable throughout the day but narrows significantly during the final hour of trading. The difference in intraday patterns between NYSE and Nasdaq stocks cannot be reconciled by differences in the intraday patterns of volume or volatility. Rather, the results indicate that structural differences between specialist and dealer markets translate into differences in the intraday pattern of bid-ask spreads. The relatively stable spreads for Nasdaq stocks after the open is consistent with the market power explanation offered by Brock and Kleidon (1992) for the wider intraday spreads of NYSE stocks at the onset of trading. The narrowing of spreads near the close for Nasdaq stocks is consistent with the use of bid and ask prices by individual dealers to control inventory.

92-44 "Stock Price Distributions with Stochastic Volatility and Option Pricing: An Alternative Approach," by Clifford A. Ball and Antonio Roma. (March 27, 1993)

A number of stochastic volatility option pricing models have been introduced recently. Numerical pricing methods have been proposed, for example, see Wiggins (1987), though risk neutral or Martingale approaches, which provide analytical representations, are more elegant and usually more efficient. For these latter techniques, the distribution of the average variance of the price process plays a pivotal role. Whenever its moments may be computed, they may be employed to generate power series expansion approximations to the option prices as discussed by Hull and White (1987) for a simple volatility model.

Alternatively, the whole moment generating function may be used to generate the security price density by Fourier inversion methods. Stein and Stein (1991) develop this approach. However, they adopt a more plausible but unnecessarily complex model for volatility. We correct some errors in earlier work and introduce a plausible model for stochastic volatility which is mathematically tractable and allows both power series and Fourier inversion approaches to option pricing. This enables a measured assessment of the benefits of the simpler power series approach. We also carefully examine possible biases introduced by the stochastic volatility option pricing models and discuss the qualitative differences between Black-Scholes and stochastic volatility option prices.

92-46 "Price Change and Trading Activity Dynamics on the London Stock Exchange," by Ronald W. Masulis and Victor Ng. (December 1993)

We examine the dynamic relations between daily return volatility and trading volume in the London stock market treating both as endogenous variables. Daily returns are decomposed into their close-to-open and open-to-close components. Trading volume is disaggregated into the number of trades and the average trade value, consistent with existing theoretical predictions. Several alternative measures of price volatility are examined, including an absolute value of open-to-close returns and the log of the daily high-low ratio. Ordinary least square estimates uncover empirical evidence that the relation between close-to-close return volatility and trading volume is primarily induced by a relation between the close-to-open return volatility and volume. Volatility measures are found to be weakly affected by prior trading volume. To allow for feed back effects from prices and volatility to volume, we also develop and estimate a trivariate GARCH system involving open-to-close returns, number of trades and average trade value. We estimate a constant correlation multivariate GARCH model with Student-t distributed conditional errors. The squared errors from one dependant variable are allowed to enter the conditional variances of the other dependent variables. An asymmetric leverage volatility effect is also estimated. Seasonalities and structural shift adjustments to prices and trading volume are also made. All measures of trading volume are found to be

strongly affected by prior price volatility. The number of trades and the average trade value have very different dynamic behavior. We find that trading volume does not account for the asymmetric effect of past returns on the conditional variance of the open-to-close returns. We also find evidence of time varying volatility for the volume measures and volatility spillovers between returns and volume.

92-47 "Impacts of Seasoned Equity Offerings on Market Microstructure and the Stock Return Generating Process," by Hyuk Choe, Ronald Lease, Ronald W. Masulis, and John Page. (January 18, 1993)

We document negative stock price reactions to the announcements of seasoned common stock offerings utilizing a larger sample of equity issues and more precise event dates than prior studies. We explore the causes of these puzzling price reactions by examining changes in the stocks' return-generating processes and market microstructure environment. Specifically, we look for changes in return volatility, systematic risk, financial leverage, trading volume, and bid-ask spreads. Permanent changes in issuing stocks' return-generating processes and microstructure environment are documented from before the announcement to after the offering date. The results do not provide strong support for the hypothesis that the negative equity announcement returns primarily are associated with increases in the asymmetric information component of the bid-ask spreads. Stronger evidence is presented which supports the hypothesis that these announcement effects are associated with expected increases in the risk of the issuing firms' real asset portfolios. This increase in risk subsequently does materialize.

93-06 "The Structure of Mutual Fund Charges," by Tarun Chordia. (April 14, 1994)

This paper considers three reasons for the increasing popularity of mutual funds: diversification, transaction cost savings and risk sharing. Mutual funds represent a commingling of assets and are required to pay each redeeming investor a pro-rata share of the net asset value of the fund. This results in a better allocation of the liquidity risk amongst the investors. However, investors who redeem their holdings in mutual funds impose an externality on those that don't. Mutual funds will thus seek to dissuade redemptions through front-end and back-end (redemption) load fees. The empirical evidence is consistent with the predictions of the model that load and redemption fees dissuade redemptions in open-end funds and that funds hold more cash when there is increased uncertainty about

redemptions. Furthermore, funds with load and redemption fees hold less cash than their no-load counterparts. The results suggest that aggressive growth funds are sensitive to cash flows and are likely to rely on fees to dissuade redemptions because they hold more of the smaller, less liquid stocks.

93-09 "Exchange Rate Pass-Through with Intertemporal Linkages: Evidence at the Commodity Level," by David C. Parsley. (December 1993)

This paper argues that the stability of exchange rate pass-through is not well tested in common econometric specifications of pass-through equations. This is because theoretically, the expectation of future exchange rates is an important omitted variable from typical import price equations, and, empirically, the use of aggregate data has severe limitations in this context. Commodity level results presented here confirm the instability in pass-through found in studies examining aggregate data. Moreover, the observed instability is consistent with forward looking behavior as posited.

93-11 "Energy Shocks and Financial Markets," by Roger D. Huang, Ronald W. Masulis, and Hans R. Stoll. (September 15, 1993)

Oil is viewed as having an important effect on the U.S. economy, and many studies analyze the macroeconomic effects of oil pricing. If such an effect is present, returns in oil futures should affect aggregate stock prices. The paper examines the contemporaneous and lead-lag correlations between daily returns of oil futures contracts and stock returns. Surprisingly, in the period of the 1980s there is virtually no correlation between oil futures returns and the returns of various stock indexes. In the case of specific oil stocks, there is contemporaneous correlation and a statistically significant one day lead of oil futures returns. However the economic significance of the lead is small. A simple bivariate correlation of raw returns produces the same conclusions as a more sophisticated multivariate vector autoregressive approach. We also investigate the association between oil volatility and stock market volatility.

93-15 "The Importance of Equity Trading Costs: Evidence from Securities Firms' Revenues," by Hans R. Stoll. (December 10, 1993)

Equity trading costs — commissions and market impact — are calculated from revenues of securities firms in the years 1980 to 1992. Given the difficulty of measuring trading costs these estimates provide a useful new measure that can be helpful in evaluating other measures of trading costs.

93-16 "Exchange Rate Pass-Through in the U.S. Market: A Cross-Country and Cross-Product Investigation," by Jiawen Yang. (October 1993)

Foreign exporters in general and Japanese exporters in particular have been observed to price to market in the U.S. Are there significant differences in their pricing behavior among exporters from different countries? Is the Japanese export pricing behavior unique? This paper addresses these questions and finds that while there is obvious variation in exchange rate pass-through among products, which relates significantly to the degree of product differentiation, no single exporter to the United States is unique in their pricing behavior.

93-17 "Exchange Rate Pass-Through in U.S. Manufacturing Industries," by Jiawen Yang. (October 1993)

This paper studies exchange rate pass-through in U.S. manufacturing industries and its cross-sectional variation. Through an adapted Dixit-Stiglitz model of product differentiation, the paper predicts that pass-through is positively related to the degree of product differentiation and inversely related to the elasticity of marginal cost with respect to output. Empirical estimates of the pass-through elasticities show that pass-through is incomplete and varies across industries. The degree of pass-through is found to be positively correlated to different proxies for product differentiation, and negatively to a proxy for the elasticity of marginal cost.

93-18 "Exchange Rate Changes and Export Pricing Behavior in U.S. Manufacturing Industries," by Jiawen Yang. (October 1993)

This paper studies export pricing behavior following exchange rate changes in U.S. manufacturing industries. Through a monopolistic model, the paper predicts that export prices should change, but less than proportionally, in response to exchange rate changes if either or both demand elasticity and marginal cost are variable. Cross-industry variation of such price changes can be explained by the difference in demand elasticities between the domestic and

the export markets, the elasticity of marginal cost with respect to output, and the export share. These predictions are supported by the empirical findings of the paper.

93-19 "Why Do Nasdaq Market Makers Avoid Odd-Eighth Quotes?" by William G. Christie and Paul H. Schultz. (Forthcoming in *The Journal of Finance*)

The Nasdaq multiple dealer market is designed to produce narrow bid-ask spreads through the competition for order flow among individual dealers. However, we find that odd-eighth quotes are virtually not-existent for 71 of 100 actively traded Nasdaq securities, including Apple Computer and Lotus Development. The lack of odd-eighth quotes cannot be explained by the negotiation hypothesis of Harris (1991), trading activity, or other variables thought to impact spreads. This result implies that the inside spread for a large number of Nasdaq stocks is at least \$0.25 and raises the question of whether Nasdaq dealers implicitly collude to maintain wide spreads.

93-21 "Inflation and Relative Price Variability: Evidence from a New Data Set," by David C. Parsley. (July 1994)

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. The relationship is studied using a number of measures of distortion and individual price series collected from forty-eight U.S. cities. The data set enables new tests to be performed examining previously ignored implications of the models generating inflation-relative price linkages. 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. Finally, this paper presents evidence of a long term impact of inflation on relative prices. This persistence is consistent with both the relative-aggregate confusion, and the menu cost models, and suggests substantial real effects of inflation not commonly discussed.

93-28 "Direct Solicitation and Large Audit Firm Dominance in the Audit Market," by Paul K. Chaney, Debra Jeter, and Pam Erickson Shaw.

93-30 "The Causes and Consequences of the Rise in Third Market and Regional Trading," by Hans R. Stoll. (January 11, 1994)

This study examines the causes and consequences of the rise in trading of NYSE listed securities in the third market and the regional exchanges. Evidence on the NYSE's falling market share and its impact on market quality is presented. I conclude that these developments have led to more competitive markets and more efficient provision of trading services. While today's markets are more fragmented geographically than in the past, they are economically integrated by high speed computer technology that provides price information and efficiently routes orders to different markets.

93-32 "Exchange Rate Pass-Through in U.S. Manufacturing Industries: A Demand-Side Story," by Angelos A. Antzoulatos and Jiawen Yang. (October, 1993)

Using a comprehensive sample of 100 manufacturing industries at the two, three and four-digit SIC codes, this paper tests whether the surge in U.S. consumer demand in the mid-1980's caused a structural break in the exchange rate pass-through equation, as suggested by monopolistic competition models with increasing marginal cost. The econometric results confirm such a break in almost half the sample industries the pass-through effect is significant. In addition, the structural break is more prevalent in such industries as Electrical and Electronic Machinery and other Electrical Equipment and Transportation Equipment which have been at the center of trade friction between the U.S. and its major trading partners.

93-33 "Purchasing Power Parity with Fixed Nominal Exchange Rates: Commodity Level Evidence from the U.S.," by David C. Parsley and Shang-Jin Wei. (December 1993)

93-46 "Overnight and Daytime Stock Return Dynamics on the London Stock Exchange: The Impact of "Big Bang," by Ronald W. Masulis and Victor K. Ng. (August 19, 1994)

We explore the time series properties of stock returns on the London Stock Exchange by modifying a GARCH model of stock returns to allow return shocks originating in overnight and daytime periods to have differing impacts and persistence on future volatility. We find evidence that overnight and daytime returns have distinctly different time series properties. We also document that overnight shocks are less persistent than

daytime shocks on daytime return volatility, and the conditional distribution of overnight returns is much more leptokurtic than the conditional distribution of daytime returns. In addition, we uncover evidence of structural shifts following Big Bang and the 1987 stock market crash.

93-56 "Measuring and Comparing Smoothness in Time Series: The Production Smoothing Hypothesis," by Luke M. Froeb and Robert Koyak. (Forthcoming in *Journal of Econometrics*)

Long run variance divided by short run variance is proposed as a measure of smoothness for a univariate time series. Limiting distributions are derived for the measure. A test is derived to compare the smoothness measure of one time series to that of another. For Gaussian processes, the asymptotic distribution of the test statistic is normal. Simulations suggest that the test statistic performs well in small samples and for non-Gaussian processes. We use the methodology to test the long versus short run implications of the production smoothing hypothesis: in the long run, sales and production move together, but in the short run, inventories act as a buffer between sales and production. When combined with variance ratio tests, smoothness tests offer a viable alternative to structural estimation for identifying production smoothing behavior.

93-57 "The Effects of Mergers in Differentiated Products Industries: Logit Demand and Merger Policy," by Luke M. Froeb and Gregory Werden. (Forthcoming in *Journal of Law, Economics and Organization*)

Using the logit model, and assuming Nash equilibrium in prices and constant marginal cost, it is straightforward to estimate critical demand parameters and simulate mergers. In this way, the logit model can be used to predict the price and welfare effects of mergers. We explore the effects of mergers in this model both analytically and through simulations of hypothetical mergers of U.S. long distance carriers. We find that only mergers involving AT&T would be likely to lessen welfare significantly. Simulations such as these provide a firmer foundation for antitrust policy than traditional structural indicators. The logit model is not always appropriate, but the basic methodology can be adapted to other demand systems.

93-58 "The Demsetz Postulate and the Effects of Mergers in Differentiated Products Industries," by Luke M. Froeb, Timothy J. Tardiff, and Gregory J. Werden.

This paper focuses on the potential welfare enhancing effects of shifts in production from small- or medium-sized merging firms, to larger nonmerging firms, which are both lower cost and produce superior products. This sort of firm asymmetry arises in an industry characterized by the Demsetz Postulate, which states that larger firms grew because of cost and product advantages over rivals. Assuming Bertrand competition and logit demand, we simulate mergers of Japanese long distance carriers and find that mergers not involving the dominant carrier would enhance welfare under plausible conditions. The simulations employ parameters estimated from data generated through a survey of Japanese residential users, using a logit demand system.

93-59 "Competition in the Production of Costly Information: An Economic Analysis of Adversarial versus Court-Appointed Presentation of Expert Testimony," by Luke M. Froeb and Bruce H. Kobayashi. (August 20, 1993)

In this paper, we consider the problem of a naive decision maker who has a choice of either relying on the information reports of interested parties, or gathering information himself. The archetypal example is that of a lay judge or jury who can either rely on testimony of experts hired by opposing litigants or rely on a court appointed expert. The production of information is costly. We assume a court appointed expert reports the sample mean. In contrast, interested parties gather information using optimal stopping rules, and report only the most favorable information to the decision maker. The naive decision maker then forms his own estimate by taking the average of the extreme reports of the interested parties. We show that the naive decision maker's "split the difference" estimator is unbiased under conditions of symmetry, and is preferred to the sample mean when the cost of drawing is high, and when the distribution is fairly "flat." Our results suggest that the expanded use of court appointed experts and the use of mandatory limits on privately provided experts should be approached with caution.

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94-01 "Managerial Incentives to Manipulate the Timing of Project Resolution," by David Hirshleifer and Tarun Chordia. (January 1994)

A manager who wants to be viewed favorably by others has an incentive to advance or delay the resolution of uncertainty about his firm's profitability. In the model, a high ability manager tries to advance resolution of a likely-favorable outcome, while a low ability manager may defer resolution. Such manipulation of resolution timing causes over-investment in execution projects (which tend to resolve early) relative to exploratory projects (which tend to resolve late), and affects investment in hastening project resolution. In contrast with other recent models, managers may secretly overinvest. The model is consistent with several stylized facts about relationships between R&D expenditures, acquisitions, institutional share ownership, product introductions, and associated stock price reactions, and provides several untested predictions. The analysis also implies that takeover threats can encourage hidden investments in innovative, late-resolving projects, which provides a new perspective on the policy debate about the alleged "short-term" focus of U.S. managers. Finally, the model implies a perverse sorting of high ability managers to conventional R&D projects and low ability managers to more visionary projects.

94-02 "Market Making, the Tick Size, and Payment-for-Order-Flow: Theory and Evidence," by Tarun Chordia and Avanidhar Subrahmanyam. (January 1994)

This paper analyzes the effects of a finite tick size and the practice of 'payment-for-order-flow' on competition between NYSE and non-NYSE market makers. Due to the presence of non-specialist market makers, order submitters find that their NYSE orders are sometimes executed at better than quoted prices. Our analysis implies that even if the NYSE reservation price is superior to its non-NYSE counterpart, brokers may, due to payment-for-order flow, prefer to execute orders off the NYSE floor. In accordance with the implications of the model, we provide empirical evidence that non-NYSE market makers trade a larger fraction of the smaller order sizes and offer fewer price improvement opportunities. Also, large companies appear to have enhanced price improvement opportunities on the NYSE, suggesting that the number of non-specialist market makers positively affects such opportunities.

94-05 "Anatomy of Trading Costs: Evidence from the NYSE," by Roger D. Huang and Hans R. Stoll. (March 21, 1994)

This paper measures the economic costs of executing trades net of information effects by the reversal in price following a trade. The price reversal is reconciled with other measures of execution costs by recognizing the varying characteristics of the trading process. The estimate of economic execution cost 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. In 1991, the economic cost is estimated at 2.8 cents per share. The estimates are stable over time but are dramatically higher for block sales than for block purchases. A joint examination of economic execution costs and the revenues of securities firms suggests that limit orders are "picked off."

94-06 "An Innovation Variance Ratio Test," by Luke M. Froeb. (March 23, 1994)

A test is derived for comparing the innovation variances of two time series. The test is easy to compute because it does not depend on estimation of the unknown ARMA structure of the series. Inference proceeds directly from the integrated log periodogram. For two correlated white noise series, the test is also a variance ratio test. The test is used to compare the variances of two correlated asset returns.

94-12 "Naive, Biased, yet Bayesian: Jury Decision Making," by Luke M. Froeb and Bruce H. Kobayashi. (March 23, 1994)

In a model of civil litigation, interested parties present evidence to a jury. The jury is naive in that it views evidence as a random sample when, in fact, it is selectively produced. In addition to being naive, the jury is also biased by prior beliefs that it carries into the courtroom. In spite of the jury's naivete and biasedness and in spite of the selectively-produced evidence, the true level of damages is revealed. A sophisticated decision maker might voluntarily choose to adopt the decision rules implied by the naive and biased beliefs of the jury in order to reach a full information decision. The model underscores the role of competitively-produced evidence in leading to full information decisions.

94-13 "Competitive Trading of NYSE Listed Stocks: Measurement and Interpretation of Trading Costs," by Roger D. Huang and Hans R. Stoll. (July 19, 1994)

Regulatory changes and technological developments have intensified the competition from regional exchanges and NASD market for order flow in NYSE listed stocks. In this study, the cost of executing transactions in these markets is compared on the basis of four measures: the quoted half-spread, the effective half-spread, the realized half-spread, and the perfect foresight half-spread. All transactions and quotes in 343 S&P 500 stocks are examined from 1987 to 1991. We focus, in particular, on competition from NASD market for order flow in NYSE stocks, and we provide an interpretation of differences in execution costs that takes account of different market structures and trading arrangements in the NYSE auction market and the NASD dealer market. The empirical results are compatible with a NASD market in which market-makers protect themselves from informed traders by choosing uninformed order flows and an auction/specialist market in which floor traders have the ability to shunt informed order flow on to limit orders.

94-17 "Speed of Adjustment and Cross-Correlations in Stock Returns," by Tarun Chordia and Bhaskaran Swaminathan. (July 5, 1994)

This paper provides an economic rationale for the cross-correlation patterns in stock returns. Information is incorporated into prices due to trading by informed traders 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-correlation patterns. Since trading volume and spreads are related to informed trading, the model predicts that high trading volume stocks will lead low trading volume stocks and that low bid-ask spread stocks will lead high spread stocks. We find strong evidence that returns on stock portfolios with a higher turnover lead returns on stocks with a lower turnover and that returns on stock portfolios with a lower relative bid-ask spread lead returns on stocks with a higher relative bid-ask spread. The data suggests that turnover is a better proxy for the speed of adjustment than size, which in turn is a better proxy than the relative spread.

94-18 "The Impact of the Federal Reserve Bank's Open Market Operations," by Campbell R. Harvey and Roger D. Huang. (February 1994)

The Federal Reserve Bank has the ability to change the money supply and to shape the expectations of market participants through their open market operations. These operations may amount to 20% of the day's volume and are concentrated during the half hour known as 'Fed Time.' Using previously unavailable data on open market operations, our paper provides the first comprehensive examination of the impact of the Federal Reserve Bank's trading on both fixed income instruments and foreign currencies. Our results detail a dramatic increase in volatility during Fed Time. Surprisingly, the Fed Time volatility is higher on days when open market operations are absent. In addition, little systematic differences in market impact are observed for reserve-draining versus reserve-adding operations. These results suggest that the financial markets correctly anticipate the purpose of open market operations but are unable to forecast the timing of the operations.

94-19 "Is There Life After Crime? How the Market Penalizes Corporate Criminals," by Cindy Alexander and Mark A. Cohen. (July 1994)

What happens to firms that are convicted of corporate crime? Previous studies have shown that government-imposed penalties rarely exceed the harm caused by crime. Yet, a recent paper by Alexander and Cohen (1993) provides evidence that ex ante, crime does not pay for shareholders of firms later convicted of criminal wrongdoing. The reason that crime does not pay appears to be the fact that firms incur other substantial penalties besides criminal fines, including debarment from government contracts, criminal sanctions on individuals, and market-imposed penalties. Previous authors have provided empirical evidence on one of these market-imposed penalties - a reduction in the equity value of the firm during the time period immediately following the announcement of alleged wrongdoing. Some authors have attributed this loss in equity value to the legal costs associated with the criminal proceedings and the present value of future ill-gotten gains that the firm will no longer enjoy. Others attribute this loss to a reduction in reputation capital over and above any government-imposed sanction. This paper provides further evidence on the extent of market-imposed penalties for firms convicted of corporate crime. We provide some new evidence on the source of the stock market decline by relating it to both monetary

sanctions and harm. We also examine other market-imposed sanctions, including changes in firm ownership (takeovers, LBO's, etc.), changes in the name of the firm, and turnover of CEO and other top-level managers.

94-20 "Optimal Penalty Theory and Empirical Trends in Corporate Criminal Sanctions," by Mark A. Cohen. (July 1994)

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.

94-22 "Following the Pied Piper: Do Individual Returns Herd Around the Market?" by William G. Christie and Roger D. Huang. (July 1994)

This paper tests for the presence of herd behavior in equity returns during periods of market stress. The statistic we use to capture herd behavior is dispersion, defined as the cross-sectional standard deviation of returns. When individual returns herd around the consensus of the market, dispersions are predicted to be relatively low. In contrast, rational asset pricing models predict an increase in dispersion since individual returns are repelled away from the market return when stocks differ in their sensitivity to market movements. Our results, using both daily and monthly returns, are inconsistent with the presence of herding during periods of large price movements.

94-23 "The Response of U.S. Domestic Prices to Nominal Exchange Rates in the Presence of an Active Central Bank," by David Parsley and Helen Popper. (June 1994)

94-26 "An Empirical Analysis of Convertible Debt Financing by NYSE/AMEX and NASDAQ Firms," by Craig Lewis, R. Rogalski, and J. Seward. (August 1994)

We study announcements of convertible debt issues by a large sample of 503 NYSE/AMEX and 303 NASDAQ firms. Pre-issue share price performance is abnormally good for both sets of firms, as is the case with firms that issue common equity. Announcement period returns are significantly negative for both sets of firms, and post-issue performance also is poor for both. We document a common set of factors that governs the design of convertible debt. Further, these factors are consistent with a bondholder-stockholder agency conflict explanation for the design of convertible debt. Finally, we examine a number of alternative theories that attempt to explain share price reactions to announcements of convertible debt offers. The factors that partially explain security price reactions differ across NYSE/AMEX and NASDAQ firms. Although no one theory appears to fully explain share price reactions, information asymmetries do influence the share price reactions of both sets of firms. However, we find that the source of the information asymmetry differs between NYSE/AMEX and NASDAQ firms.

94-28 "Why Did NASDAQ Market Makers Stop Avoiding Odd-Eighth Quotes?" by William G. Christie, Jeffrey H. Harris, and Paul H. Schultz. (September 14, 1994)

On May 26 and 27, 1994, several national newspapers reported the findings of Christie and Schultz (1994) who cannot reject the hypothesis that market makers of active NASDAQ stocks implicitly colluded to maintain spreads of at least \$.25 by avoiding odd-eighth quotes. On May 27, dealers in Amgen, Cisco Systems, and Microsoft sharply increased their use of odd-eighth quotes, and mean inside and effective spreads fell nearly 50%. This pattern was repeated for Apple computer the following trading day. Using individual dealer quotes for Apple and Microsoft, we find that virtually all dealers moved in unison to adopt odd-eighth quotes. ■

1993-94 Publications

"A Jump Diffusion Model for the European Monetary System," by Clifford A. Ball (with Antonio Roma), *Journal of International Money and Finance*, October 1993.

"A Review of Stochastic Volatility Models with Application to Option Pricing," by Clifford A. Ball, *Financial Markets, Institutions & Instruments*, Vol.2, No.5, December 1993.

"Target Zone Modelling and Estimation for European Monetary System Exchange Rates," by Clifford A. Ball (with Antonio Roma), *Journal of Empirical Finance*, 1, 1994.

"Brokerage Commission Schedules," by Tarun Chordia (with Michael J. Brennan), *Journal of Finance*, September 1993.

"The Changing Functional Relation Between Stock Returns and Dividend Yields," by William G. Christie and Roger D. Huang, *Journal of Empirical Finance*, Vol.1, No.2, January 1994.

"Market Structure and Liquidity: A Transactions Data Study of Exchange Listings," by William G. Christie and Roger D. Huang, *Journal of Financial Intermediation*, Vol.3, No.3, June 1994.

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"Endogeneity in the Concentration-Price Relationship: Causes, Consequences, and Cures," by Luke M. Froeb (with William N. Evans and Gregory J. Werden), *Journal of Industrial Economics*, Vol.XLI, No.4, December 1993.

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"Forecasting Futures Market Volatility," by Craig M. Lewis (with T. Day), *Journal of Derivatives*, Winter 1993.

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"Principles of Inter-Market Regulation," by Hans R. Stoll, *Journal of Financial Engineering*, Vol.2, No.1, March 1993.

"Equity Trading Costs In-the-Large," by Hans R. Stoll, *Journal of Portfolio Management*, Vol.19, No.4, Summer 1993.

"How to Settle an Estate," by H. Martin Weingartner (with Bezalel Gavish), *Management Science*, June 1993. ■