FRANCIS X. DIEBOLD
Curriculum Vitae

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Department of Economics
University of Pennsylvania
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Philadelphia, PA 19104-6297
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Born: November 12, 1959
Married, three children
Citizenship: U.S.A.

EDUCATION

Ph.D., University of Pennsylvania, 1986
B.S., Wharton School, University of Pennsylvania, 1981

CURRENT APPOINTMENTS

University of Pennsylvania, 2000-present
    WP Carey Professor of Economics and Statistics
National Bureau of Economic Research, Research Associate, 1999-present
    (Asset Pricing, Economic Fluctuations & Growth, International Finance & Macroeconomics)

PAST APPOINTMENTS

University of Pennsylvania
    Lawrence R. Klein Professor of Economics and Statistics, 1999-2000
    Director, Institute for Economic Research, 1999-2000
    Professor of Economics and Statistics, 1996-1999
    Associate Professor of Economics (with tenure), 1992-1996
    Assistant Professor of Economics (J.M. Cohen Term Chair), 1989-1992
National Bureau of Economic Research, Faculty Research Fellow
    (Economic Fluctuations and Growth), 1993-1999
Board of Governors of the Federal Reserve System, Research Economist, 1986-1989

PAST VISITING APPOINTMENTS

New York University, Stern School of Business, Department of Finance, 1998-2000
Cambridge University, Trinity College and Faculty of Economics and Politics, summer 1998

Princeton University, Department of Economics, fall 1997
Johns Hopkins University, Department of Economics, fall 1995
University of Chicago, Graduate School of Business, Department of Finance, summer 1993
London School of Economics, Financial Markets Group, spring 1992
University of Minnesota, Institute for Empirical Macroeconomics and Department of Economics, summer 1990

SELECTED HONORS AND AWARDS

Who's Who in the World (Eighteenth Edition, Marquis Publishing, 2001)
Who's Who in America (Marquis Publishing, 2001)
Who's Who in the Science and Engineering (Sixth Edition, Marquis Publishing, 2001)
Who's Who in Economics: A Biographical Dictionary of Major Economists, 1700-1995 (Third Edition, Simon James and Mark Blaug, eds., Edward Elgar Publishing, 1999)
"Club Six" Teaching Distinction, Stern School of Business, New York University, 1999
Fellow of the Econometric Society, elected 1998
Kravis Award for Outstanding Teaching, University of Pennsylvania, 1998
Kravis Award for Outstanding Teaching, University of Pennsylvania, 1994
Alfred P. Sloan Foundation Research Fellow, 1992-1994
Benedum Lecture, West Virginia University, 1992

INVITED PLENARY ADDRESSES AT PROFESSIONAL MEETINGS

Purvis Lecture, Canadian Economic Association Annual Meeting, Montreal, 2000
Econometric Society World Congress, Seattle, 2000
Computational Finance 2000, London
Econometric Society European Meeting, Spain, 1999
EC^2 Conference on Forecasting in Econometrics, Stockholm, 1998
Society for Nonlinear Dynamics and Econometrics Annual Meeting, New York University, 1998
International Association of Financial Engineers Annual Meeting, 1998
Computational Finance 1997, London Business School, 1997
International Symposium on Forecasting, Barbados, 1997

SELECTED RESEARCH FUNDING

National Science Foundation, 1998-2002, "Financial Econometrics and Forecasting"
National Science Foundation, 1995-1998, "Forecasts and Forecasting Models: Prediction, Evaluation, Estimation and Selection Using the Relevant Loss Function"
Pew Foundation, 1995-1996, "Economic Forecasting: Methods and Applications"
Alfred P. Sloan Foundation Research Fellowship, 1992-1994
National Science Foundation, 1992-1994, "Modeling and Forecasting Economic Time Series"
National Science Foundation and Cornell Super Computer Center, 1991-1992, "GARCH Models: Exact Maximum Likelihood Estimation and Temporal Aggregation"
National Science Foundation, 1989-1992, "Econometric Analysis of Dynamic Economic Relations"

SELECTED PROFESSIONAL ACTIVITIES

National Science Foundation / National Bureau of Economic Research
Forecasting Seminar, Chairman, 1995-present
National Bureau of Economic Research, Working Group Co-Chairman, Empirical Methods in Macroeconomics and Finance, 1992-present
Wharton Financial Institutions Center, Senior Fellow, 1997-present
Co-Organizer, annual Financial Engineering Roundtable
Computational Finance, Organizing Committee, 1999-present
Oliver Wyman Institute, Charter Member, 1996-present
Frank P. Ramsey Prize Selection Committee, 2000-present
National Science Foundation Economics Panel, 1998-2000
American Statistical Association, *Journal of Business and Economic Statistics* Editorial Selection Committee, 2000
Econometric Society Program Committee, 1999 North American Winter Meeting
National Center for the Educational Quality of the Workforce, Board of Senior Scholars, 1993-1995
American Statistical Association, Zellner Award Selection Committee, 1995
American Statistical Association, *Journal of Business and Economic Statistics* Editorial Selection Committee, 1994
American Statistical Association, Secretary/Treasurer, Business and Economic Statistics Section, 1994
Econometric Society, Program Committee, Time-Series Econometrics, 1993 North American Summer Meeting
National Bureau of Economic Research, Working Group Co-Chairman, Common Elements of Trends and Fluctuations, 1990-1991
American Statistical Association, Program Chair, Business and Economic Statistics Section, 1991 (Program Chair Elect, 1990)
Refereeing: All major journals and foundations
Presentations: Numerous presentations at all major universities and meetings
Dissertation supervision: Numerous University of Pennsylvania Ph.D. dissertations
Professional associations: American Economic Association, American Finance Association, Econometric Society (Elected Fellow, 1998), American Statistical Association

EDITORIAL BOARDS

Current Advisory Boards:
Advisory Board, *Journal of Financial Econometrics*, 2000-
Advisory Board, *Economic Policy Review*, Federal Reserve Bank of New York, 1997-
Advisory Board, *Macroeconomic Dynamics*, 1996-

Current Editorships:
Associate Editor, *Review of Economics and Statistics*, 1993-
Associate Editor, *Journal of Business and Economic Statistics*, 1993-
Associate Editor, *Journal of Forecasting*, 1993-

Associate Editor, *Stata Technical Bulletin*, 1993-

Past:
Editorial Board, *International Economic Review*, 1993-2000
Associate Editor, *Econometrica*, 1994-1997
Associate Editor, *Journal of Applied Econometrics*, 1991-1997
Co-Editor, *Journal of Forecasting*, 1990-1993
Associate Editor, *Journal of Empirical Finance*, 1992-1995
Associate Editor, *Econometric Reviews*, 1989-1992

BOOKS

Business Cycles: Durations, Dynamics, and Forecasting. Princeton: Princeton University Press, 1999. With G. Rudebusch.

Elements of Forecasting. Cincinnati: South-Western College Publishing.
First edition, 1998.
Second edition, 2001.
Spanish translation, *Elementos de Pronosticos*, 2000.

Empirical Modeling of Exchange Rate Dynamics. New York, Heidelberg and Tokyo: Springer-Verlag, 1988.

EDITED VOLUMES AND SPECIAL ISSUES OF JOURNALS

Forecasting and Empirical Methods in Finance and Macroeconomics. Special issue of *Journal of Econometrics*, forthcoming. With K.D. West.

Forecasting and Empirical Methods in Macroeconomics and Finance. Special issue of *Review of Economics and Statistics*, 81, 1999, 553-673. With J.H. Stock and K.D. West.

Forecasting and Empirical Methods in Macroeconomics and Finance. Special issue of *International Economic Review*, 39, 1998, 811-1144. With K.D. West.

Econometric Forecasting. Special issue of *Journal of Applied Econometrics*, 11, 453-594, 1996. With M.W. Watson.

REFEREED PAPERS

"Measuring Predictability: Theory and Macroeconomic Applications," *Journal of Applied Econometrics*, 2001, forthcoming. NBER Technical Working Paper No. 213. With L. Kilian.

"Exchange Rate Returns Standardized by Realized Volatility are (Nearly) Gaussian." *Multinational*

Finance Journal, 2001, forthcoming. With T. Andersen, T. Bollerslev and P. Labys.

"Long Memory and Regime Switching," *Journal of Econometrics*, 2001, forthcoming. With A. Inoue.

"The Distribution of Realized Stock Return Volatility," *Journal of Financial Economics*, 61, 2001, forthcoming. With T. Andersen, T. Bollerslev and H. Ebens.

"The Distribution of Realized Exchange Rate Volatility," *Journal of the American Statistical Association*, 96, 42-55, 2001. With T. Andersen, T. Bollerslev and P. Labys.

"Unit Root Tests are Useful for Selecting Forecasting Models," *Journal of Business and Economic Statistics*, 18, 265-273, 2000. With L. Kilian.

"Great Realizations," *Risk*, 13, 105-108, March 2000. With T. Andersen, T. Bollerslev and P. Labys. (Revised version of "Understanding, Optimizing, Using and Forecasting Realized Volatility and Correlation," Working Paper FIN-99-061, Department of Finance, Stern School of Business, New York University.)

"How Relevant is Volatility Forecasting for Financial Risk Management?," *Review of Economics and Statistics*, 82, 12-23, 2000. With P. Christoffersen.

"Exact Maximum Likelihood Estimation of Observation-Driven Econometric Models," in R.S. Mariano, M. Weeks and T. Schuermann (eds.), *Simulation-Based Inference in Econometrics: Methods and Applications*, 2000, 205-217. Cambridge: Cambridge University Press. With T. Schuermann.

"Multivariate Density Forecast Evaluation and Calibration in Financial Risk Management: High-Frequency Returns on Foreign Exchange," *Review of Economics and Statistics*, 81, 661-673, 1999. With J. Hahn and A. Tay.

"Evaluating Density Forecasts of Inflation: The Survey of Professional Forecasters," in R. Engle and H. White (eds.), *Cointegration, Causality, and Forecasting: A Festschrift in Honor of Clive W.J. Granger,* 76-90, 1999. Oxford: Oxford University Press. With A. Tay and K. Wallis.

"Liquidity on the Outside," *Risk*, 12, 68-73, 1999. With A. Bangia, T. Schuermann, and J. Stroughair.

> Reprinted in expanded form as "Modeling Liquidity Risk, With Implications for Traditional Market Risk Measurement and Management," in S. Figlewski and R. Levich (eds.), *Frontiers of Financial Risk Management.* Amsterdam: Kluwer Academic Publishers, 2001.

"Dynamic Equilibrium Economies: A Framework for Comparing Models and Data," *Review of Economic Studies*, 65, 433-452, 1998. With L. Ohanian and J. Berkowitz.

"Pitfalls and Opportunities in the Use of Extreme Value Theory in Risk Management," in A.-P. N. Refenes, A.N. Burgess and J.D. Moody (eds.), *Decision Technologies for Computational Finance*, 3-12. Amsterdam: Kluwer Academic Publishers, 1998. With T. Schuermann and J. Stroughair.

> Reprinted in *Journal of Risk Finance*, 1 (Winter 2000), 30-36.
>
> Reprinted in P. Embrechts (ed.), *Extremes and Integrated Risk Management.* London: Risk Publications, 2000.

"Evaluating Density Forecasts, With Applications to Financial Risk Management," *International Economic Review*, 39, 863-883, 1998. With T. Gunther and A. Tay.

"Cointegration and Long-Horizon Forecasting," *Journal of Business and Economic Statistics*, 16, 450-458, 1998. With P. Christoffersen.

"The Past, Present and Future of Macroeconomic Forecasting," *Journal of Economic Perspectives*, 12, 175-192, 1998.

"Bootstrapping Multivariate Spectra," *Review of Economics and Statistics*, 80, 664-666, 1998. With J. Berkowitz.

"Scale Models," *Risk*, 11, 104-107, 1998. With T. Schuermann, A. Hickman and A. Inoue.

> Reprinted in M. Broadie and P. Glasserman (eds.), *Hedging with Trees: Advances in Pricing and Risk Managing Derivatives*, 233-237, 1998. London: Risk Publications.

"Optimal Prediction Under Asymmetric Loss," *Econometric Theory*, 13, 808-817, 1997. With P. Christoffersen.

"Bounded Rationality and Strategic Complementarity in a Macroeconomic Model: Policy Effects, Persistence and Multipliers," *Economic Journal*, 107, 1358-1375, 1997. With A. Bomfim.

"Job Stability in the United States," *Journal of Labor Economics*, 15, 206-233, 1997. With D. Neumark and D. Polsky.

"Why are Estimates of Agricultural Supply Response so Variable?," *Journal of Econometrics*, 76, 357-373, 1997. With R. Lamb.

"Forecast Evaluation and Combination," in G.S. Maddala and C.R. Rao (eds.), *Handbook of Statistics*, 241-268, 1996. Amsterdam: North-Holland. With J. Lopez.

"Further Results on Forecasting and Model Selection Under Asymmetric Loss," *Journal of Applied Econometrics*, 11, 561-572, 1996. With P. Christoffersen.

"Testing Structural Stability With Endogenous Break Point: A Size Comparison of Analytic and Bootstrap Procedures," *Journal of Econometrics*, 70, 221-241, 1996. With C. Chen.

"Fractional Integration and Interval Prediction," *Economics Letters*, 50, 305-313, 1996. With P. Lindner.

"Measuring Business Cycles: A Modern Perspective," *Review of Economics and Statistics*, 78, 67-77, 1996. With G.D. Rudebusch.

"Modeling Volatility Dynamics," in Kevin Hoover (ed.), *Macroeconometrics: Developments, Tensions and Prospects*, 427-472, 1995. Boston: Kluwer Academic Press. With J. Lopez.

"Comparing Predictive Accuracy," *Journal of Business and Economic Statistics*, 13, 253-265, 1995. With R.S. Mariano.

> Reprinted in *Economic Forecasting* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 1998.

"Regime Switching with Time-Varying Transition Probabilities," in C. Hargreaves (ed.), *Nonstationary Time Series Analysis and Cointegration*. (*Advanced Texts in Econometrics,* C.W.J. Granger and G. Mizon, eds.), 283-302, 1994. Oxford: Oxford University Press. With J.-H. Lee and G. Weinbach.

"Maximum Likelihood Estimation of Fractionally Integrated Noise with Unknown Mean," *Journal of Econometrics*, 62, 301-316, 1994. With Y.-W. Cheung.

"Cointegration and Exchange Rate Dynamics," *Journal of Finance*, 49, 727-735, 1994. With J. Gardeazabal and K. Yilmaz.

"Further Evidence on Business Cycle Duration Dependence" (with discussion), in J.H. Stock and M.W. Watson (eds.), *Business Cycles, Indicators and Forecasting*, 255-284, 1993. Chicago: University of Chicago Press for NBER. With G.D. Rudebusch and D.E. Sichel.

"A Note on Conditional Heteroskedasticity in the Market Model," *Journal of Accounting, Auditing* *and Finance*, 8, 141-150, 1993 Spring. With J. Lee and S. Lim.

"Have Postwar Economic Fluctuations Been Stabilized?," *American Economic Review*, 82, 993-1005, 1992. With G. Rudebusch.

"Real Exchange Rates Under the Gold Standard," *Journal of Political Economy*, 99, 1252-1271, 1991. With S. Husted and M. Rush.

"Forecasting Output with the Composite Leading Index: An Ex Ante Analysis," *Journal of the American Statistical Association*, 86, 603-610, 1991. With G. Rudebusch.

> Reprinted in *Economic Forecasting* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 1998.

"On Bayesian Forecast Combination Procedures," in *Economic Structural Change: Analysis and Forecasting* (A. Westlund and P. Hackl, eds.), 225-232, 1991. New York: Springer-Verlag.

"On the Power of Dickey-Fuller Tests Against Fractional Alternatives," *Economics Letters*, 35, 155-160, 1991. With G. Rudebusch.

"Is Consumption too Smooth? Long Memory and the Deaton Paradox," *Review of Economics and Statistics*, 73, 1-9, 1991. With G. Rudebusch.

"The Use of Prior Information in Forecast Combination," *International Journal of Forecasting*, 6, 503-508, 1990. With P. Pauly.

"Turning point Prediction with the Composite Leading Index: An Ex Ante Analysis," in *Leading Economic Indicators: New Approaches and Forecasting Records* (Kajal Lahiri and Geoffrey H. Moore, eds.), 231-256, 1991. Cambridge: Cambridge University Press. With G. Rudebusch.

"Post-Deregulation Bank Deposit Rate Pricing: The Multivariate Dynamics," *Journal of Business and Economic Statistics*, 8, 281-293, 1990. With S. Sharpe.

"Nonparametric Exchange Rate Prediction?," *Journal of International Economics*, 28, 315-332, 1990. With J. Nason.

"A Nonparametric Investigation of Duration Dependence in the American Business Cycle," *Journal of Political Economy*, 98, 596-616, 1990. With G. Rudebusch.

"Unit Roots in Economic Time Series: A Selective Survey," in *Advances in Econometrics: Co-Integration, Spurious Regressions, and Unit Roots*, (Thomas B. Fomby and George F. Rhodes, eds.), 3-69, 1990. Greenwich, Connecticut: JAI Press. With M. Nerlove.

"Long Memory and Persistence in Aggregate Output," *Journal of Monetary Economics*, 24, 189-209, 1989. With G. Rudebusch.

"Scoring the Leading Indicators," *Journal of Business*, 62, 369-392, 1989. With G. Rudebusch.

"The Dynamics of Exchange Rate Volatility: A Multivariate Latent-Factor ARCH Model," *Journal of Applied Econometrics*, 4, 1-22, 1989. With M. Nerlove.

"Random Walks vs. Fractional Integration: Power Comparisons of Scalar and Joint Tests of the Variance-Time Function," in Baldev Raj (ed.), *Advances in Econometrics and Modeling*, 29-45, 1989. *Advanced Studies in Theoretical and Applied Econometrics*, Volume 15. Boston: Kluwer Academic Publishers.

"Small Sample Properties of Asymptotically Equivalent Tests for Autoregressive Conditional Heteroskedasticity," *Statistische Hefte*, 30, 105-131, 1989. With P. Pauly.

"Forecasting in Situations of Structural Change: A General Approach," in P. Hackl (ed.), *Statistical Analysis and Forecasting of Economic Structural Change*, 297-318, 1989. New York: Springer-Verlag. With P. Pauly.

"Has the EMS Reduced Member-Country Exchange Rate Volatility?," *Empirical Economics*, 13, 81-102, 1988. With P. Pauly.

"Testing for Bubbles, Reflecting Barriers, and Other Anomalies," *Journal of Economic Dynamics and Control*, 12, 63-70, 1988.

"Endogenous Risk in a Portfolio-Balance Rational-Expectations Model of the Deutschemark / Dollar Rate," *European Economic Review*, 32, 27-54, 1988. With P. Pauly.

"Serial Correlation and the Combination of Forecasts," *Journal of Business and Economic Statistics*, 6, 105-112, 1988.

"Structural Change and the Combination of Forecasts," *Journal of Forecasting*, 6, 21-40, 1987. With P. Pauly.

"The Combination of Forecasts," *Prevision et Analyse Economique*, 7, 7-31, 1986. With P. Pauly.

"The Exact Initial Covariance Matrix of the State Vector of a General MA(q) Process," *Economics Letters*, 22, 27-31, 1986.

"Exact Maximum-Likelihood Estimation of Autoregressive Models via the Kalman Filter," *Economics Letters*, 22, 197-202, 1986.

COMMENTS

"Comment on O. Barndorff-Nielsen and N. Shephard: "Non-Gaussian Ornstein-Uhlenbeck-Based Models and Some of Their Uses in Financial Economics," *Journal of the Royal Statistical Society* B, 63, forthcoming, 2001.

"Comment on A. Harvey and C.-H. Chung: Estimating the Underlying Change in Unemployment in the UK," *Journal of the Royal Statistical Society* A, 163, forthcoming, 2000.

"Comment on J. Durbin and S. J. Koopman: Time Series Analysis of non-Gaussian Observations Based on State Space Models from both Classical and Bayesian Perspectives," *Journal of the Royal Statistical Society* B, 62, 29-56, 2000.

"The Uncertain Unit Root in Real GNP: Comment," *American Economic Review*, 86, 1291-1298, 1996. With A. Senhadji.

"Is Job Stability Declining in the U.S. Economy?: Comment," *Industrial and Labor Relations Review*, 49, 348-352, 1996. With D. Neumark and D. Polsky.

"The Effect of Seasonal Adjustment Filters on Tests for a Unit Root: Comment," *Journal of Econometrics*, 55, 99-103, 1993.

"Modeling Asset Returns with Stable Distributions: Comment," *Econometric Reviews*, 12, 339-342, 1993.

"On the Limitations of Comparing Mean Square Forecast Errors," *Journal of Forecasting*, 12, 641-642, 1993.

"Intertemporal Consumer Behavior Under Structural Changes in Income: Comment," *Econometric Reviews*, 8, 93-100, 1989.

"Forecast Combination and Encompassing: Reconciling Two Divergent Literatures," *International Journal of Forecasting*, 5, 589-592, 1989.

"An Application of Operational-Subjective Statistical Methods to Rational Expectations: A Comment," *Journal of Business and Economic Statistics*, 6, 470-472, 1988.

"Prediction, Extraction and Estimation in Unobserved Components Models: Solution," *Econometric Theory*, 4, 356-359, 1988. With M. Nerlove.

"Prediction, Extraction and Estimation in Unobserved Components Models: Problem," *Econometric Theory*, 3, 305, 1987. With M. Nerlove.

"Modeling the Persistence of Conditional Variances: A Comment," *Econometric Reviews*, 5, 51-56, 1986.

INVITED PAPERS

"Interview: Professor Robert F. Engle," *Macroeconomic Dynamics*, in press.

"'Big Data' Dynamic Factor Models for Macroeconomic Measurement and Forecasting," *Advances in Econometrics, Eighth World Congress of the Econometric Society.* Cambridge: Cambridge University Press, forthcoming.

"Econometrics: Retrospect and Prospect," *Journal of Econometrics*, 100, 73-75, 2001.

"Forecasting and Empirical Methods in Finance and Macroeconomics: Editors' Introduction," in F.X. Diebold and K.D. West (Eds.), *Forecasting and Empirical Methods in Finance and Macroeconomics*, Special Issue of *Journal of Econometrics*, forthcoming. With K.D. West.

"Managing Volatility," *Asia Risk*, December 1999, 35-36. With A. Santomero.

"Forecasting and Empirical Methods in Macroeconomics and Finance: Editors' Introduction," in F.X. Diebold and K.D. West (Eds.), *Forecasting and Empirical Methods in Macroeconomics and Finance*, Special Issue of *International Economic Review*, 39, 811-816, 1998. With K.D. West.

"Horizon Problems and Extreme Events in Financial Risk Management," *Economic Policy Review*, Federal Reserve Bank of New York, October 1998, 109-118. With P. Christoffersen and T. Schuermann.

"Introduction: Econometric Forecasting," in F.X. Diebold and M.W. Watson (eds.) *Econometric Forecasting*, Special issue of *Journal of Applied Econometrics*, 11, (September-October), 453-454, 1996. With M.W. Watson.

"On Asymmetry in Economic Time Series," in M. Dutta (ed.), *Economics, Econometrics and the Link: Essays in Honor of Lawrence R. Klein*, 119-128, 1995. Amsterdam: North-Holland.

"Lawrence Klein's *The Keynesian Revolution*, Fifty years Later," *Proceedings of the 12th Annual*

Economics Day, Department of Economics, University of Pennsylvania, 1992.

"Are Long Expansions Followed by Short Contractions?," *Business Review*, Federal Reserve Bank of Philadelphia, July-August, 3-11,1993.

"Shorter Contractions and Longer Expansions," *Business Review,* Federal Reserve Bank of Philadelphia, November-December, 13-20, 1991. With G.D. Rudebusch.

"Nonparametric Prediction of Asset Returns: Further Negative Results," *Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1989,* 380-383. Washington, DC: American Statistical Association, 1990. With R. Sella.

"On the Exact Distribution of Certain Test Statistics for the Random Walk Hypothesis," *Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1989*. Washington, DC: American Statistical Association, 1990, 226-230. With M. Chandrakantha, J. Mehta and P. Swamy.

"On 'Unit Root Econometrics': Discussion of Papers by Geweke, Sims, and DeJong and Whiteman," *Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1989,* 71-74. Washington, DC: American Statistical Association, 1990.

"Stochastic Properties of Revisions in the Index of Leading Indicators," Proceedings of the American Statistical Association, Business and Economic Statistics Section, 712-717. Washington, DC: American Statistical Association, 1988. With G. Rudebusch.

"Time-Series Analysis," in J. Eatwell, M. Milgate, and P. Newman (eds.), *The New Palgrave: A Dictionary of Economic Theory and Doctrine, Volume 4*, 646-652, 1987. New York: McMillan & Co. With M. Nerlove.

> Reprinted in J. Eatwell, M. Milgate and P. Newman (eds.) *The New Palgrave: Time Series and Statistics*, 294-309, 1990. New York: McMillan & Co.

"Estimation," in J. Eatwell, M. Milgate, and P. Newman (eds.), *The New Palgrave: A Dictionary of Economic Theory and Doctrine, Volume 2*, 192-195, 1987. New York: McMillan & Co. With M. Nerlove.

> Reprinted in J. Eatwell, M. Milgate and P. Newman (eds.) *The New Palgrave: Time Series and Statistics*, 82-89, 1990. New York: McMillan & Co.

"Autoregressive and Moving-Average Time-Series Processes," in J. Eatwell, M. Milgate, and P. Newman (eds.), *The New Palgrave: A Dictionary of Economic Theory and Doctrine,* *Volume 1*, 153-158, 1987. New York: McMillan & Co. With M. Nerlove.

Reprinted in J. Eatwell, M. Milgate, and P. Newman (eds.) *The New Palgrave: Time Series and Statistics*, 25-35, 1990. New York: McMillan & Co.

Reprinted in revised form in J. Eatwell, M. Milgate and P. Newman (eds.), *The New Palgrave: Money and Finance*, 1991. New York: McMillan & Co.

"Rational Expectations, Random Walks, and Monetary Models of the Exchange Rate," *Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1986*, 101-106. Washington, DC: American Statistical Association, 1987.

"Testing for Serial Correlation in the Presence of ARCH," *Proceedings of the American Statistical Association, Business and Economic Statistics Section, 1986*, 323-328. Washington, DC: American Statistical Association, 1987.

BOOK AND SOFTWARE REVIEWS

Modelling Extremal Events for Insurance and Finance, by P. Embrechts, C. Klüppelberg, and T. Mikosch, *Risk*, 12, 63, 1999.

STAMP 5.0, by A.C. Harvey et al., *International Journal of Forecasting*, 12, 309-315, 1996. With L. Giorgianni and A. Inoue.

State Space Modeling of Time Series (Second Edition), by M. Aoki, *Journal of the American Statistical Association*, 88, 1171, 1993.

State-Space Modeling of Time Series, by M. Aoki, *Journal of Economic Dynamics and Control*, 13, 597-612, 1989.

Forecasting, Structural Time Series Models and the Kalman Filter, by A.C. Harvey, *Econometric Theory*, 8, 293-299, 1992.

State Space Modeling of Time Series, by M. Aoki, *Journal of the American Statistical Association*, 84, 339-340, 1989.

Structural Time Series Analysis and Modeling Package, by A.C. Harvey et al., *Journal of Applied Econometrics*, 4, 195-204, 1989.

WORKING PAPERS

"Modeling and Forecasting Realized Volatility," Wharton Financial Institutions Center Working Paper 2001-01. With T. Andersen, T. Bollerslev and P. Labys. (2001)

“Ratings Migration and the Business Cycle, with Application to Credit Portfolio Stress Testing.” With A. Bangia and T. Schuermann. (2000)

“Range-Based Estimation of Stochastic Volatility Models, or: Exchange Rate Dynamics are More Interesting Than You Think.” With S. Alizadeh and M.W. Brandt. (1999, revised 2000)