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Education

Ph.D., Economics, University of Pennsylvania, 1986
B.S. Economics, University of Pennsylvania, 1981

Current Appointments (University of Pennsylvania)

Paul F. Miller, Jr. and E. Warren Shafer Miller Professor of Social Sciences
School of Arts and Sciences, 2008-present
Professor of Economics, School of Arts and Sciences, 2008-present
Professor of Finance, Wharton School, 2000-present
Professor of Statistics, Wharton School, 1996-present

Current Research Institute Appointments

National Bureau of Economic Research, Cambridge, Mass., Research Associate, 1999-present
Penn Institute for Economic Research, University of Pennsylvania, Fellow, 2000-present
Jacobs Levy Center for Quantitative Financial Research, University of Pennsylvania, Fellow and Board Member, 2014-present
Warren Center for Network and Data Sciences, University of Pennsylvania, Inaugural Affiliate, 2013-present

Past Appointments

University of Pennsylvania

Co-Director, Wharton Financial Institutions Center, 2007-2013
Professor of Economics, 1996-2008 (various chairs, 1999-2008)
Associate Professor of Economics (with tenure), 1992-1996
Assistant Professor of Economics, 1989-1992

Elsewhere

Executive Director, Morgan Stanley Investment Management, 2007-2008
(on leave from University of Pennsylvania)
Economist, Board of Governors of the Federal Reserve System, Washington, DC, 1986-1989

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

Honors

Fellow, International Association for Applied Econometrics, since 2018
 Fellow, Society for Economic Measurement, since 2014
 Fellow, *Journal of Econometrics*, since 2014
 President, Society for Financial Econometrics, 2011-2013
 Honorary Fellow, International Institute of Forecasters, since 2012
 Fellow, American Statistical Association, since 2004
 Alexander von Humboldt Award, Germany, 2004
 Fellow, John Simon Guggenheim Foundation, 2003-2004
 "Comparing Predictive Accuracy," (*Journal of Business and Economic Statistics*, 13, 253-265, 1995, with R.S. Mariano) reprinted in E. Ghysels and A. Hall, eds., Special Twentieth Anniversary Commemorative Issue of *Journal of Business and Economic Statistics*, 20, 134-144, 2002, containing the ten most influential papers published in the journal's first twenty years.
 "Club Six" Teaching Distinction, New York University, 1999
 Fellow, Econometric Society, since 1998
 Kravis Award for Outstanding Teaching, University of Pennsylvania, 1994, 1998
 Fellow, Alfred P. Sloan Foundation, 1992-1993

Major Lectures

Granger Lecture, University of Nottingham, UK, 2019 (scheduled)
Journal of Business and Economic Statistics Annual Lecture, Philadelphia, 2014
 Presidential Address, Society for Financial Econometrics, Singapore, 2013
Journal of Applied Econometrics Annual Lecture, Toulouse School of Economics, 2012
 Distinguished Scholar Lecture, CREATES, University of Aarhus, Denmark, 2012
 Tinbergen Lectures, Erasmus University Rotterdam, 2010
 (Published as *Yield Curve Modeling and Forecasting*, Princeton University Press, 2013)
 W.A. Mackintosh Lecture, Queen's University, Kingston, Ontario, 2010
 CASE Lecture, Humboldt University, Berlin, 2010
 Royal Economic Society Annual Meeting, Plenary Lecture, Warwick, England, 2008
 Hermann Otto Hirschfeld Lectures, Humboldt University, Berlin, 2005
 Lawrence R. Klein Lecture, Project LINK, Mexico City, 2005
 Marshak Lecture, Econometric Society, Melbourne, 2004
 Purvis Lecture, Canadian Economic Association, Montreal, 2001
 European Meeting of the Econometric Society, Plenary Lecture, Santiago de Compostela, Spain, 1999

Books

Financial and Macroeconomic Connectedness: A Network Approach to Measurement and Monitoring, Oxford University Press, 2015. With K. Yilmaz.
Yield Curve Modeling and Forecasting: The Dynamic Nelson-Siegel Approach. Princeton University Press (*The Tinbergen Lectures*), 2013. With G. Rudebusch.

Business Cycles: Durations, Dynamics and Forecasting. Princeton University Press, 1999. With G. Rudebusch. (Chapter 1 reprinted as "Five Questions About Business Cycles," *Economic Review*, Federal Reserve Bank of San Francisco, 1-15, 2001.)

Elements of Forecasting. Cincinnati: South-Western, 1998. Second edition, 2001. Third edition, 2004. Fourth edition, 2007. (Also Spanish, Indian, and Chinese editions.)

Empirical Modeling of Exchange Rate Dynamics. Springer-Verlag, 1988.

Edited Volumes

Financial Risk Measurement and Management (International Library of Critical Writings in Economics, Volume 267), Edward Elgar Publishing Ltd., 2012.

The Known, the Unknown and the Unknowable in Financial Risk Management. Princeton University Press, 2010, with N. Doherty and R. Herring. (Winner of Kulp-Wright Award, American Risk and Insurance Association.)

Risk Management for Central Bank Foreign Reserves. Frankfurt: European Central Bank, 2004, with C. Bernadell, P. Cardon, J. Coche and S. Manganelli.

Edited Journal Issues

Big Data in Dynamic Predictive Econometric Modeling, special issue of *Journal of Econometrics*, in progress. With E. Ghysels, P. Mykland and L. Zhang.

The Econometrics of Macroeconomics, Finance and the Interface, special issue of *Journal of Econometrics*, 131, 1-612, 2006. With R. Engle, C. Favero, G. Gallo and F. Schorfheide.

New Directions in Financial Risk Management, special issue of *Journal of Financial Econometrics*, 3, 1-168, 2005. With R. Garcia, S. Mittnik and E. Renault.

Regulatory Capital and Operational Risk Management, special issue of *Journal of Risk Finance*, 4, 2002, 25-56. With J. Drzik, R. Herring and A. Kuritzkes.

Symposium on Forecasting Performance, special issue of *IMF Staff Papers*, 49, 1-64, 2002.

Forecasting and Empirical Methods in Finance and Macroeconomics, special issue of *Journal of Econometrics*, 105, 2001, 1-308. With K. West.

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

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

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

Articles

"Commodity Connectedness," in E. Mendoza, D. Saravia and E. Pasten (eds.), *Monetary Policy and Global Spillovers: Mechanisms, Effects and Policy Measures*. Santiago: Bank of Chile Central Banking Series, Volume 25, 97-136, 2018. With L. Liu and K. Yilmaz.

"Estimating Global Bank Network Connectedness," *Journal of Applied Econometrics*, 33, 1-15, 2018. With M. Demirer, L. Liu, and K. Yilmaz.

"Real-Time Forecast Evaluation of DSGE Models with Stochastic Volatility," *Journal of Econometrics*, 201, 322-332, 2017. With F. Schorfheide and M. Shin.

"Assessing Point Forecast Accuracy by Stochastic Error Distance," *Econometric Reviews* (Special Issue in Honor of E. Maasoumi; P.C.B. Phillips and A. Ullah, eds.), 36, 588-598, 2017. With M. Shin.

"Consistent Scoring Functions, Choquet Representations, and Forecast Rankings: Comment on Ehm, Gneiting, Jordan and Krüger," *Journal of the Royal Statistical Society, Series B*, 2016, 544.

"Improving GDP Measurement: A Measurement-Error Perspective," *Journal of Econometrics*, 191, 384-397, 2016. With S.B. Aruoba, J. Nalewaik, F. Schorfheide and D. Song.

"Trans-Atlantic Equity Volatility Connectedness: U.S. and European Financial Institutions, 2004-2014," *Journal of Financial Econometrics*, 14, 81-127, 2016. With K. Yilmaz.

"Measuring the Dynamics of Global Business Cycle Connectedness," in S.J. Koopman and N. Shephard (eds.), *Unobserved Components and Time Series Econometrics: Essays in Honor of Andrew C. Harvey*, Oxford University Press, 2015, 45-89. With K. Yilmaz.

"Assessing Point Forecast Accuracy by Stochastic Loss Distance," *Economics Letters*, 130, 37-38, 2015. With M. Shin.

Diebold, F.X. (2015), "Comparing Predictive Accuracy, Twenty Years Later: A Personal Perspective on the Use and Abuse of Diebold-Mariano Tests" (with discussion), *Journal of Business and Economic Statistics*, 33, 1-24.

"On the Network Topology of Variance Decompositions: Measuring the Connectedness of Financial Firms," *Journal of Econometrics*, 182, 119-134, 2014. With K. Yilmaz. (Dennis J. Aigner Award for Applied Econometrics, Honorable Mention, 2016.)

"Financial Risk Measurement for Financial Risk Management," in G. Constantinescu, M. Harris and R. Stulz (eds.), *Handbook of the Economics of Finance*, Volume 2, Part B, Elsevier, 1127-1220, 2013. With T. Andersen, T. Bollerslev and P. Christoffersen.

"On the Correlation Structure of Microstructure Noise: A Financial Economic Approach," *Review of Economic Studies*, 80, 1304-1337, 2013. With G. Strasser.

"A Markov-Switching Multi-Fractal Inter-Trade Duration Model, with Application to U.S. Equities," *Journal of Econometrics*, 177, 2013, 320-342. With F. Chen and F. Schorfheide.

"Improving GDP Measurement: A Forecast Combination Perspective," in X. Chen and N. Swanson (eds.), *Recent Advances and Future Directions in Causality, Prediction and Specification Analysis: Essays in Honor of Halbert L. White Jr.*, Springer, 1- 26, 2012. With B. Aruoba, J. Nalewaik, F. Schorfheide and D. Song.

"Better to Give than to Receive: Predictive Directional Measurement of Volatility Spillovers" (with discussion), *International Journal of Forecasting*, 28, 57-66, 2012. With K. Yilmaz. (Awarded best paper in a two-year interval, 2015.)

"The Affine Arbitrage-Free Class of Nelson-Siegel Term Structure Models," *Journal of Econometrics*, 164, 4-20, 2011. With J. Christensen and G. Rudebusch.

"Globalization, the Business Cycle and Macroeconomic Monitoring" (with discussion), in R. Clarida and F. Giavazzi (eds.), *NBER International Seminar on Macroeconomics*. Chicago: University of Chicago Press, 2011, 245-302. With B. Aruoba, A. Kose and M. Terrones.

"Equity Market Spillovers in the Americas," in R. Alfaro (ed.) *Financial Stability, Monetary Policy, and Central Banking*. Santiago: Bank of Chile Central Banking Series, Volume 15, 199-214, 2011. With K. Yilmaz. (Spanish translation published as: "Efectos Errame en Los Mercados de Valores del Continente Americano," *Revista Economía Chilena*, 12, 55-65, 2009.)

"Real-Time Macroeconomic Monitoring: Real Activity, Inflation and Interactions," *American Economic Review*, 100, 20-24, 2010. With B. Aruoba.

"Parametric and Nonparametric Volatility Measurement," in L.P. Hansen and Y. Ait-Sahalia (eds.), *Handbook of Financial Econometrics*. Amsterdam: North-Holland, 2010, 67-138. With T.G. Andersen and T. Bollerslev.

"Macroeconomic Volatility and Stock Market Volatility, Worldwide," in T. Bollerslev, J. Russell and M. Watson (eds.), *Volatility and Time Series Econometrics: Essays in Honor of Robert F. Engle*. Oxford University Press, 2010, 97-116. With K. Yilmaz.

"An Arbitrage-Free Generalized Nelson-Siegel Term Structure Model," *Econometrics Journal*, 12, 33-64, 2009. With J. Christensen and G.D. Rudebusch.

"Real-Time Measurement of Business Conditions," *Journal of Business and Economic Statistics*, 27, 417-427, 2009. With S.B. Aruoba and C. Scotti.

"Measuring Financial Asset Return and Volatility Spillovers, With Application to Global Equity Markets," *Economic Journal*, 119, 158-171, 2009. With K. Yilmaz.

"Stock Returns and Expected Business Conditions: Half a Century of Direct Evidence," *Journal of Business and Economic Statistics*, 27, 266-278, 2009. With S. Campbell.

"Global Yield Curve Dynamics and Interactions: A Generalized Nelson-Siegel Approach," *Journal of Econometrics*, 146, 351-363, 2008. With C. Li and V. Yue.

"Roughing It Up: Including Jump Components in the Measurement, Modeling and Forecasting of Return Volatility," *Review of Economics and Statistics*, 89, 701-720, 2007. With T. Andersen and T. Bollerslev.

"Real-Time Price Discovery in Stock, Bond and Foreign Exchange Markets," *Journal of International Economics*, 73, 251-277, 2007. With T. Andersen, T. Bollerslev and C. Vega.

"Financial Asset Returns, Direction-of-Change Forecasting and Volatility Dynamics," *Management Science*, 52, 1273-1287, 2006. With P. Christoffersen.

"The Macroeconomy and the Yield Curve: A Dynamic Latent Factor Approach," *Journal of Econometrics*, 131, 309-338, 2006. With G. Rudebusch and B. Aruoba.

"Realized Beta: Persistence and Predictability," in T. Fomby and D. Terrell (eds.) *Advances in Econometrics: Econometric Analysis of Economic and Financial Time Series*, Volume B, 2006, 1-40. With T. Andersen, T. Bollerslev and G. Wu.

"Volatility and Correlation Forecasting," in G. Elliott, C.W.J. Granger and Allan Timmermann (eds.), *Handbook of Economic Forecasting*. Amsterdam: North-Holland, 2006, 778-878. With T. Andersen, T. Bollerslev and P. Christoffersen.

"Forecasting the Term Structure of Government Bond Yields," *Journal of Econometrics*, 130, 337-364, 2006. With C. Li.

"Practical Volatility and Correlation Modeling for Financial Market Risk Management," in M. Carey and R. Stulz (eds.), *Risks of Financial Institutions*, University of Chicago Press for NBER, 2006, 513-548. With T. Andersen, T. Bollerslev and P. Christoffersen.

"A No-Arbitrage Approach to Range-Based Estimation of Return Covariances and Correlations," *Journal of Business*, 79, 61-74, 2006. With M. Brandt.

"Weather Forecasting for Weather Derivatives," *Journal of the American Statistical Association*, 100, 6-16, 2005 (lead article for the year). With S. Campbell.

"A Framework for Exploring the Macroeconomic Determinants of Systematic Risk," *American Economic Review*, 95, 398-404, 2005. With T. Andersen, T. Bollerslev and J. Wu.

"Modeling Bond Yields in Finance and Macroeconomics," *American Economic Review*, 95, 415-420, 2005. With M. Piazzesi and G. Rudebusch.

"The Nobel Memorial Prize for Robert F. Engle," *Scandinavian Journal of Economics*, 106, 165-185, 2004.

"Modeling and Forecasting Realized Volatility," *Econometrica*, 71, 579-626, 2003. With T. Andersen, T. Bollerslev and P. Labys.

"Micro Effects of Macro Announcements: Real-Time Price Discovery in Foreign Exchange," *American Economic Review*, 93, 38-62, 2003. With T.G. Andersen, T. Bollerslev and C. Vega.

"The ET Interview: Professor Robert F. Engle," *Econometric Theory*, 19, 1159-1193, 2003.

"'Big Data' Dynamic Factor Models for Macroeconomic Measurement and Forecasting," in M. Dewatripont, L.P. Hansen and S. Turnovsky (eds.), *Advances in Economics and Econometrics: Theory and Applications, Eighth World Congress of the Econometric Society*. Cambridge University Press, 2003, 115-122.

"Range-Based Estimation of Stochastic Volatility Models," *Journal of Finance*, 57, 1047-1092, 2002 (lead article). With S. Alizadeh and M.W. Brandt.

"Ratings Migration and the Business Cycle, with Application to Credit Portfolio Stress Testing," *Journal of Banking and Finance*, 26, 445-474, 2002. With A. Bangia, A. Kronimus, C. Schagen and T. Schuermann.

(Reprinted in expanded form as "Modeling Liquidity Risk, With Implications for Traditional Market Risk Measurement and Management," in S. Figlewski and R.M. Levich (eds.), *Risk Management: The State of the Art*. Boston: Kluwer Academic Publishers, 2002, 1-13.)

"Measuring Predictability: Theory and Macroeconomic Applications," *Journal of Applied Econometrics*, 16, 657-669, 2001. With L. Kilian.

"Long Memory and Regime Switching," *Journal of Econometrics*, 105, 131-159, 2001. With A. Inoue.

"The Distribution of Realized Stock Return Volatility," *Journal of Financial Economics*, 61, 43-76, 2001. With T. Andersen, T. Bollerslev and H. Ebers.

"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.

(Reprinted in N. Shephard (ed.), *Stochastic Volatility: Selected Readings*. Oxford: Oxford University Press, 2005.)

"Exchange Rate Returns Standardized by Realized Volatility are (Nearly) Gaussian," *Multinational Finance Journal*, 4, 159-179, 2000. 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. (Abridged 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.)

(Reprinted in J. Danielsson, ed., *The Value-at-Risk Reference*. London: Risk Publications, 2008.)

"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 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.

(Reprinted in *Forecasting Financial Markets* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 2002.)

"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 University Press. With A. Tay and K. Wallis.

"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. (Revised and abridged version of "Converting 1-Day Volatility to h-Day Volatility: Scaling by \sqrt{h} is Worse than You Think," Wharton Financial Institutions Center, Working Paper 97-34.)

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

(Reprinted in B. Warwick, ed., *The Handbook of Risk*, 2003. New York: John Wiley and Sons.)

"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.

(Reprinted in R. Rieves and B. Warwick (eds.), *Handbook of Risk Management*. New York: John Wiley and Sons, 2003. Reprinted in *ICFAI Journal of Financial Risk Management*, 3, 7-18, 2004.)

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

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

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

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

"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.

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

(Reprinted in *Long-Term Trends and Business Cycles* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 2002.)

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

"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.

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

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

"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.)

(Reprinted in E. Ghysels and A. Hall, eds., Special Twentieth Anniversary Commemorative Issue of *Journal of Business and Economic Statistics*, 20, 134-144, 2002.)

"Modeling Volatility Dynamics," in K. Hoover (ed.), *Macroeconometrics: Developments, Tensions and Prospects*, 427-472, Springer. With J. Lopez.

"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 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. University of Chicago Press for NBER. With G.D. Rudebusch and D.E. Sichel.

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

"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.

(Reprinted in *New Developments in Exchange Rate Economics* (L. Sarno and M.P Taylor, eds.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 2002.)

"Forecasting Output with the Composite Leading Index: A Real-Time 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.)

"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.

"A Note on Bayesian Forecast Combination Procedures," in P.Hackl and A. Westlund (eds.), *Economic Structural Change*, 225-232, 1991.

"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 (lead article). With G. Rudebusch.

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

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

(Reprinted in *Forecasting Financial Markets* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 2002.)

(Reprinted in *Financial Forecasting* (R. Batchelor and P. Dua, eds.), part of the *International Library of Critical Writings in Financial Economics* (R. Roll, series ed.), Edward Elgar Publishing, 2003.)

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

(Reprinted in *Long-Term Trends and Business Cycles* (T.C. Mills, ed.), part of the *International Library of Critical Writings in Economics* (M. Blaug, series ed.), Edward Elgar Publishing, 2002.)

"Post-Deregulation Bank-Deposit-Rate Pricing: The Multivariate Dynamics," *Journal of Business and Economic Statistics*, 8, 281-291, 1990. With S. Sharpe.

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

"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.

(Reprinted in N. Shephard, ed., *Stochastic Volatility: Selected Readings*. Oxford: Oxford University Press, 2005.)

"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.

"Endogenous Risk in a Portfolio-Balance Rational-Expectations Model of the Deutschmark-Dollar Rate," *European Economic Review*, 32, 27-53, 1988. 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.

- "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.
- "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.
- "Modeling the Persistence of Conditional Variances: A Comment," *Econometric Reviews*, 5, 51-56, 1986.
- "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, 197-201, 1986.

Unpublished Work

- "The Network Structure of Factor Structure", Work in Progress, University of Pennsylvania, 2018. With M. Grith.
- "Best-Subset Density Forecast Combination", Work in Progress, University of Pennsylvania, 2018. With M. Shin.
- "Egalitarian LASSO for Combining Economic Forecasts", Manuscript, University of Pennsylvania, 2018, submitted. With M. Shin.
- "On the Comparison of Interval Forecasts", Manuscript, University of Pennsylvania, 2018, submitted. With R. Askanasi, F. Schorfheide and M. Shin.

Ph.D. Dissertation Supervision (** Denotes Main Advisor)

- ** Paul Sangrey (in progress) (Other committee members Frank Schorfheide (Co-Main Advisor), Amir Yaron, Xu Cheng.)
- ** Ross Askanasi (2017), "Applied Dynamic Factor Modeling in Finance". (Went to Cornerstone Research. Other committee members Xu Cheng, Frank DiTraglia.)
- ** Jacob Warren (2017), "Essays in Nonlinear Econometrics". (Went to Stevens Capital Management. Other committee members Frank Schorfheide (Co-Main Advisor), Xu Cheng.)
- ** Laura Liu (2017), "Point and Density Forecasts in Panel Data Models." (Went to Board of Governors of the Federal Reserve System. Other committee members Frank Schorfheide (Co-Main Advisor), Xu Cheng.)
- Katja Gisler (2016, University of St. Gallen Ph.D.), "Essays on the Economic Relevance of Volatility Spillovers." (Other committee members Matthias Fengler (St. Gallen), Francesco Audrino (St. Gallen), Daniel Buncic (St. Gallen).)
- Molin Zhong (2015), "Essays on Bayesian Macroeconometrics." (Went to Board of Governors of the Federal Reserve System. Other committee members Jesus Fernandez-Villaverde, Frank Schorfheide.)
- ** Minchul Shin (2015), "Bayesian GMM." (Went to University of Illinois. Other committee members Frank Schorfheide (Co-Main Advisor), Xu Cheng, Frank DiTraglia.)
- ** Lorenzo Braccini (2015), "Essays in Dynamic Duration and Count Modeling." (Went to Bank of Italy. Other committee members Xu Cheng, Frank Schorfheide.)
- ** Dongho Song (2014), "Essays on Risk Measurement and Modeling in Macroeconomics and Finance." (Went to Boston College. Other committee members Frank Schorfheide (Co-Main Advisor), Ivan Shaliastovich, Amir Yaron.)
- Mark Bognanni (2013), "Essays in Empirical Macroeconomics." (Went to Federal Reserve Bank of Cleveland. Other committee members Frank Schorfheide, Jesus Fernandez-Villaverde.)
- Han Chen (2013) "Essays on Unconventional Monetary Policy." (Went to Board of Governors of the Federal Reserve System. Other committee members Frank Schorfheide, Harold Cole.)
- ** Fei Chen (2011), "Multifractal Duration Modeling." (Went to Huazhong University of Science and Technology (HUST), China. Other committee members Frank Schorfheide, Kevin Song.)

Dalibor Stevanovic (2011, University of Montreal Ph.D.), "Factor Models, VARMA Processes and Parameter Instability with Applications in Macroeconomics." (Went to European University Institute and University of Quebec. Other committee members Jean-Marie Dufour (McGill), Jean Boivin (Bank of Canada), Benoît Perron (Montreal), Francisco Ruge-Murcia (Montreal).)

Edward Herbst (2011), "Essays on Bayesian Macroeconometrics." (Went to Board of Governors of the Federal Reserve System. Other committee members Frank Schorfheide, Jesus Fernandez-Villaverde.)

Asyl Bakinova (2011, University of Lugano Ph.D.), "Futures Volatility in the Crude Oil Market." (Other committee members Giovanni Barone-Adessi (Lugano) and Patrick Gagliardini (Lugano).)

** Leonardo Melosi (2010), "Essays on the Macroeconomics of Incomplete Information." (Went to London Business School. Other committee members Frank Schorfheide (Co-Main Advisor), Jesus Fernandez-Villaverde, Dirk Krueger.)

Edith Liu (2010), "On International Finance and Risk Sharing." (Went to Cornell University. Other committee members Karen Lewis and Craig MacKinlay.)

Christina Fuentes-Albero (2010), "Essays on Financial Frictions, Propagation of Shocks and Macroeconomic Volatility." (Went to Rutgers University. Other committee members Frank Schorfheide, Jesus Fernandez-Villaverde and Urban Jermann.)

Max Kryshko (2010), "Essays in Estimation of Dynamic Stochastic General Equilibrium Models." (Went to IMF. Other committee members Frank Schorfheide and Jesus Fernandez-Villaverde.)

** Jian Hua (2010), "Essays in Financial Econometrics." (Went to Baruch College, City University of New York. Other committee members Aureo De Paula, David Musto.)

** Georg Strasser (2008), "Essays in Applied Econometrics." (Went to Boston College. Other committee members Urban Jerman, Karen Lewis, Frank Schorfheide.)

Taeyoung Doh (2007), "Three essays on the estimation of dynamic macroeconomic models." (Went to Federal Reserve Bank of Kansas City. Other committee members F. Schorfheide, A. Yaron.)

Sungbae An (2006), "Essays on Bayesian Estimation of Dynamic Economies." (Went to Singapore Management University. Other committee members Frank Schorfheide, Jesus Fernandez-Villaverde.)

** Vivian Yue (2005), "Essays on Sovereign Default and Emerging Countries." (Went to New York University. Other committee members Urban Jerman, Dirk Krueger, Martin Uribe.)

** Chiara Scotti (2005), "A Multivariate Bayesian Analysis of Policy Rates: Fed and ECB Timing and Level Decisions." (Went to Board of Governors of the Federal Reserve System. Other committee members Jesus Fernandez-Villaverde, Frank Schorfheide.)

** Jin (Ginger) Wu (2005), "Essays on Financial Economics and Econometrics." (Went to University of Georgia. Other committee members Gregory Kordas, Craig MacKinlay, Frank Schorfheide, Yihong Xia.)

** Yansong (Bill) Lu (2005), "Modeling and Forecasting Daily Stock Return Volatility with Intra-day Price Fluctuation Information." (Went to Lehman Brothers. Other committee members Yuichi Kitamura, Frank Schorfheide.)

** Lei Ji (2005), "Essays in Financial Economics and Econometrics." (Went to Lehman Brothers. Other committee members Gregory Kordas, Frank Schorfheide, Yihong Xia.)

** Aruoba, Boragan (2004), "Data Uncertainty: Empirical Evidence, General Equilibrium Implications and Hedging Strategies." (Went to University of Maryland. Other committee members Jesus Fernandez-Villaverde, Dirk Krueger, Frank Schorfheide.)

** Campbell, Sean (2002), "Regime Switching in Economics." (Went to Brown University. Other committee members Yuichi Kitamura, Roberto Mariano and Frank Schorfheide. Winner of the Hayes prize, awarded biennially for the best graduate student research contribution in a two-year interval.)

** Vega, Clara (2002), "Public Information, Private Information and Microstructure Theory." (Went to University of Rochester. Other committee members Simone Gervais, Frank Schorfheide.)

** Li, Canlin (2002), "Essays in Financial Economics and Econometrics." (Went to University of California, Riverside. Other committee members Michael Brandt, Frank Schorfheide.)

** Labys, Paul (2001), "Essays on Microstructure and the Use of Information in Limit Order Markets." (Went to Charles River Associates. Other committee members Ken Kavajecz, Patrik Sandas, Frank Schorfheide.)

- ** Cheng, Yingmei (2001), "Essays in Financial Economics and Applied Econometrics." (Went to Florida State University. Other committee members Gary Gorton, Craig MacKinlay, Petra Todd.)
- Jones, Christopher (1999), "Bayesian Investigation of Continuous Time Finance Models." (Went to University of Rochester. Other committee members Craig MacKinlay, Krishna Ramaswamy, Robert Stambaugh.)
- Zhang, Jing (1998), "Model Selection and Some Extensions of Markov Switching Models." (Went to Moody's KMV.)
- ** Alizadeh, Sassan (1998), "Essays in Financial Econometrics." (Went to Bear Sterns. Other committee members Michael Brandt, Sanford Grossman.)
- ** Inoue, Atsushi (1998), "Three Essays in Time Series Econometrics." (Went to North Carolina State University. Other committee members Valentina Corradi, Jinyong Hahn. Winner of Carey Prize for best dissertation.)
- ** Altissimo, Filippo (1997), "Essays in Macroeconometrics." (Went to Bank of Italy. Other committee members Albert Ando, Valentina Corradi.)
- ** Shapiro, Natalie (1997), "Civil and Political Liberties Over Space and Time: A Markov Model of Transition Dynamics." (Went to Massachusetts Financial Services. Other committee members Valentina Corradi, Roberto Mariano.)
- ** Tay, Anthony (1997), "Density Forecast Evaluation: Theory and Applications." (Went to National University of Singapore. Other committee members Valentina Corradi, Jinyong Hahn.)
- ** Kilian, Lutz (1996), "Small Sample Confidence Intervals for Impulse Response Estimates." (Went to University of Michigan. Other committee members Lee Ohanian, Robert Stine.)
- ** Berkowitz, Jeremy (1996), "Estimating and Evaluating Economic Models Via Spectral Analysis." (Went to Board of Governors of the Federal Reserve System. Other committee members Valentina Corradi, Lee Ohanian.)
- ** Christoffersen, Peter (1996), "Essays on Forecasting in Economics." (Went to McGill University. Other committee members Albert Ando, Roberto Mariano.)
- ** Giorgianni, Lorenzo (1996), "On Expectations and Risk Premia in Foreign Exchange Markets: Evidence from Survey Data." (Went to International Monetary Fund. Other committee members Albert Ando, Richard Marston.)
- ** Binder, Michael (1995), "Essays in Empirical Macroeconomics." (Went to University of Maryland. Other committee members Lee Ohanian, Victor Rios-Rull.)
- Gong, Faxiong (1995), "Essays on Several Contemporary Issues in Econometrics and Financial Economics." (Went to Federal Reserve Bank of New York. Other committee members Roberto Mariano and Joseph Gyourko.)
- ** Chauvet, Marcelle (1995), "An Econometric Characterization of Business Cycle Dynamics with Factor Structure and Regime Switching." (Went to University of California, Riverside. Other Committee members Roberto Mariano, Lee Ohanian.)
- ** Lopez, Jose (1995), "Evaluating Forecasts of Exchange Rate Volatility." (Went to Federal Reserve Bank of New York. Other committee members Roberto Mariano, Lee Ohanian.)
- Hodges, Scott (1994), "Business Cycles in Historical Perspective." (Other committee members Daniel Raff and Christopher Hanes.)
- ** Senhadji, Abdelhak (1994), "Adjustment of a Small Open Economy to External Shocks." (Went to Washington University in St. Louis. Other committee members Jere Berhman, Wilfred Ethier, Lee Ohanian.)
- ** Mor, Nachiket (1994), "Essays on Nonlinearity in Exchange Rates." (Went to Corporation of India Limited (ICICI). Other committee members Sanford Grossman, Karen Lewis.)
- ** Weinbach, Gretchen (1993), "Regime Switching with Time-Varying Transition Probabilities: Methodological Issues and Application to Exchange Rates." (Went to Board of Governors of the Federal Reserve System. Other committee members Alan Auerbach, Fumio Hayashi.)
- ** Chen, Celia (1993), "Tests for Structural Change With Endogenous Break Point and Their Finite Sample Properties." (Went to Regional Financial Associates, Philadelphia, now Moody'sEconomy.com. Other committee members Fumio Hayashi, Roberto Mariano.)
- Schuermann, Til (1993), "Simulation-Based Econometrics." (Went to Bell Labs. Other committee members Marc Nerlove, Roberto Mariano.)

Fornari, Ilaria (1993), "Quasi-Rational and Fully-Rational Expectations: An Application to Modeling U.S. Beef Cattle Supply." (Went to JP Morgan. Other committee members Roberto Mariano and Marc Nerlove.)

Ansotegui, Carmen (1993), "Stock Market and Real Activity Cointegration Analysis: Application to U.S. and Japan Markets." (Went to E.S.A.D.E. Business School, Barcelona, Spain. Other committee members Roberto Mariano and Craig MacKinlay.)

Bomfim, Antulio (1992, University of Maryland), "Strategic Complementarities and Business Cycles: Essays in Dynamic Macroeconomics." (Went to Board of Governors of the Federal Reserve System. Other committee members John Haltiwanger, Allan Drazen, Martin Bailey, Martin Loeb, Michael Haliassos.)

Golub, John (1992), "The Equity Premium: Sensitivity to Consumption Misspecification and a Non- Expected Utility Resolution." (Went to Federal Reserve Bank of Kansas City. Other committee members Andrew Abel, Franklin Allen, Richard Kihlstrom.)

Bradley, Ralph (1992), "A Nonparametric Investigation Into the Health Care Crisis." (Went to Bureau of Labor Statistics. Other committee members Roberto Mariano and Peter Pauly.)

Tanizaki, Hisashi (1991), "Nonlinear Filters: Estimation and Applications." (Went to Kobe University, Japan. Other committee members Roberto Mariano and Marc Nerlove.)

Lee, Joon-Haeng (1991), "Nonstationary Markov-Switching Models of Exchange Rates." (Went to Korean Securities Research Institute, Seoul, Korea. Other committee members Roberto Mariano and Sandy Grossman.)

Gardeazabal, Javier (1991), "The Monetary Model of Exchange Rate Determination in the Light of Cointegration." (Went to University of the Basque Country, Spain, Department of Economics. Other committee members Roberto Mariano and Marc Nerlove.)

Regulez, Marta (1991), "Prediction With Cointegrated Systems: Theory and Applications." (Went to University of the Basque Country, Spain, Department of Economics. Other committee members Marc Nerlove and Roberto Mariano.)

** Lindner, Peter (1991), "Interest Rates, Inflation and Risk: An Empirical Investigation." (Went to Lehman Brothers. Other committee members Roberto Mariano, Robert Stambaugh.)

Shen, Qi (1991), "Essays on Transaction Costs and their Impact on Financial Decisions." (Went to University of Michigan, Graduate School of Business.)

Lee, Jai-Seong (1990), "Transition of Economic Regime and Shift in Production Function: Estimation and Testing of Alternative Production Function Models on Nine Subsectors of Korean Industries, 1971-1987."

Willson, Douglas (1990, "Essays in Macroeconometrics and Financial Econometrics." (Went to Concordia University. Other committee members Roberto Mariano and Marc Nerlove.)

Belessakos, Elias D. (1990), "Exchange Rate Target Zones and the European Monetary System." (Went to Baruch College, City University of New York.)

Boldin, Michael (1990), "Business Cycles and Stock Market Volatility: Theory and Evidence of Animal Spirits." (Went to Federal Reserve Bank of New York. Other committee members F. Gerard Adams and Costas Azariadis.)

Cheung, Yin-Wong (1990), "Long Memory in Foreign Exchange Rates and Sampling Properties of Some Statistical Procedures Related to Long Memory Series." (Went to University of California, Santa Cruz. Other committee members Roberto Mariano and Marc Nerlove.)

Arvin-Rad, Hassan (1990), "Two Essays in Econometric Theory." (Went to Florida State University. Other committee members Roberto Mariano and Peter Pauly.)

Feyzioglu, Tarhan (1989), "Analysis of Nonlinear, Nonnormal Economic Time Series and Applications." (Went to Georgetown University. Other committee members Roberto Mariano and Marc Nerlove.)

Hassett, Kevin (1989), "Essays in Applied Econometrics." (Went to Columbia University. Other committee members Albert Ando and Alan Auerbach.)

Post-Doc and Visiting Student Supervision

Jorge Hansen (2018) (from Aarhus University); Umut Akovali (2017-2018) (from Koc University, Istanbul); Daniel Borup (2017) (from Aarhus University); Sergey Nasekin (2016) (from Humboldt University, Berlin); Maria Grith (2015-2016) (from Humboldt University, Berlin); Ronald Indergand (2015-2016) (from University of Bern); Katja

Gisler (2015-2016) (from University of St. Gallen); Chu Kin (Roy) Chan (2014-2015) (from City University of Hong Kong); Diego Fresoli (2012) (from Universidad Carlos III de Madrid); Dalibor Stevonovic (2011) (from University of Montreal); Asyl Bakanova (2011) (from University of Lugano); Bernd Schlusche (2008) (from University of Bonn); Emanuel Moench (2007) (from Humboldt University Berlin); Peter Lildolt (2001) (from Aarhus University)

Recent Undergraduate Mentoring (Weekly Reading/Research Group, Honors Thesis Supervision, etc.)

Jordan Dellavalle (2018); Daniel Onorato (2018); JoonYup Park (2018); Sarah Whinton (2017, went to Jordan on Fulbright Student Research Fellowship); Theodore Caputi (2017, went to University College Cork, Ireland, Master's program in Public Health); Hong Ken Teoh (2017, went to Columbia University, Economics PhD program); Modibo Camara (2016, went to Northwestern University, Economics PhD program); Bas Bergmans (2016, went to Amazon UK); Han Tian (2016, went to AQR Capital Management); Juan Ignacio Perez-Gea (2016, went to BCG Consulting, Miami); Max Miller (2015, went to Federal Reserve Board, Washington, DC, then Wharton School, Finance Ph.D. program)

Recent Presentations (Approximately Last Five Years)

2018 (including scheduled): Houston, TX, Rice University seminar; Sao Paulo, Brazil, Annual Brazilian Meeting of Finance, Invited Lecture Series; Boston, Mass., NBER Summer Institute, Research paper presentation; York, UK, University of York, Center for Applied Macro-Finance Asset Pricing Conference, Keynote Lecture; Frankfurt, Germany, European Central Bank Conference on Economic Forecasting with Large Datasets, Invited Lecture; Vienna, Austria, Technical University of Vienna, Seminar; Chicago, IL, U Chicago / U Penn Stevanovic-Warren Conference on New Aspects of Statistics, Financial Econometrics, and Data Science, Invited Lecture; Amelia Island, GA, Federal Reserve Bank of Atlanta Financial Markets Conference, Panel on Machine Learning in Finance; Philadelphia, PA, University of Pennsylvania PIER Workshop on Quantitative Tools for Macroeconomic Policy Analysis Lectures on macroeconometrics and financial econometrics; Los Angeles, CA, USC Seminar; Washington, DC, Johns Hopkins University, Guest lecture; Washington, DC, International Monetary Fund, Seminar; Philadelphia, PA, ASSA meeting

2017: St. Louis, MO, FRB St. Louis Conference on Forecasting in Central Banks; Evanston, IL, NBER/NSF Time Series Meeting; New York, NYU/Stern, Society for Financial Econometrics, Annual Meeting; New York, NYU/Stern, Annual Volatility Institute Conference; Washington, DC, IMF Conference on Forecasting, Keynote address; Chicago, ASSA Meetings

2016: Charlotte, NC, FRB Richmond, Seminar; Newark, Delaware, University of Delaware, Seminar; Santiago, Chile, Central Bank of Chile, Annual Conference Invited Paper; Brussels, Belgium, CORE Lectures and Seminar, National Bank of Belgium Seminar; Chicago, University of Chicago, Becker-Friedman Institute Conference on Machine Learning and Economics; Durham, North Carolina, Duke University, Conference on Financial Econometrics; Boston, Boston University, Conference on Financial Econometrics; Gerzensee, Switzerland, Study Center Gerzensee, Swiss National Bank, Lecture Series; Cambridge, Mass., NBER Summer Institute; Hong Kong, SoFiE Annual Meeting, Lecture series; Chicago, R in Finance Annual Meeting, Keynote; Philadelphia, University of Pennsylvania, PIER Lectures; Nice, France, EDHEC Lectures; Baltimore, Johns Hopkins University, Eleventh Greater New York Metropolitan Area Econometrics Colloquium; San Francisco, ASSA Meeting

2015: San Francisco, Federal Reserve Bank of San Francisco, Bank of Canada / FRBSF Conference on Fixed Income Markets; Chicago, University of Chicago, Conference on Econometrics of High-Dimensional Risk Networks; Nashville, Vanderbilt University, Econometrics Seminar; San Francisco, Federal Reserve Bank of San Francisco, Visiting Scholar; Cambridge, Mass., NBER Summer Institute; Washington, DC, IMF Lectures; Braga, Portugal, University of Minho, NIPE Lectures; Vienna, Institute for Advanced Studies, Workshop on High-Dimensional Time Series in Macroeconomics and Finance, Plenary Address; University of Pennsylvania, PIER Policy Tools Workshop; Stern School, NYU, Volatility Institute Conference on Fixed Income Risk; Boston, ASSA Meeting

2014: Emory University, Conference in Honor of Essie Massoumi; University of Pennsylvania, Conference in Memorial of Lawrence R. Klein; University of California, San Diego, Conference in Honor of Jim Hamilton; Duke University, ERID Lecture and Visit; University of Chicago, Society for Economic Measurement, Inaugural Annual Meeting, Keynote Lecture; Washington, DC, IMF Lectures; Cambridge, Mass., NBER Summer Institute; Frankfurt, Germany; European Central Bank Workshop on Forecasting Techniques; University of Maryland, Conference

Honoring Marc Nerlove; Florence, Italy, European University Institute; Philadelphia, PA, ASSA Meetings, Journal of Business and Economic Statistics Annual Lecture

2013: Boston University, Seminar; Washington, DC, Bureau of Economic Analysis, Seminar; Lugano, Switzerland, Society for Financial Econometrics (SoFiE) / University of Lugano, Conference on Large-Scale Factor Models in Finance; Washington, DC (Federal Reserve Board), NBER/NSF Time Series Meeting; Washington, DC, IMF Lectures; Singapore, Society for Financial Econometrics (SoFiE) Annual Meeting, Presidential Address; Rotterdam, Journal of Applied Econometrics annual meeting, Invited Lecture; Santa Cruz, California, Sury Initiative for Global Finance and International Risk Management and University of California, Santa Cruz Public Lecture; City University of New York, Seminar; San Diego, California, ASSA Meetings

Editorial Boards

Journal of Financial Econometrics, 2000-present (advisory board)

International Journal of Central Banking, 2005-present (associate editor)

Journal of Applied Econometrics, 1991-1997 (associate editor), 2011-2014 (co-editor)

Journal of Business and Economic Statistics, 1993-2003 (associate editor)

Econometrica, 1994-1997 (associate editor)

Review of Economics and Statistics, 1993-2002 (associate editor)

International Economic Review, 1993-2000 (co-editor)

Scientific Meetings Organized

University of Pennsylvania (Warren Center) / University of Chicago (Stevanovic Center)
Conference Series, 2015-present

New Aspects of Statistics, Financial Econometrics, and Data Science, University of Chicago, 2018.

Big Data in Predictive Dynamic Econometric Modeling, University of Pennsylvania, 2017

Econometrics of High-Dimensional Risk Networks, University of Chicago, 2015

Conference in Honor of Marc Nerlove, Washington, DC 2015

Conference in Memory of Lawrence R. Klein, University of Pennsylvania, 2014

Society for Financial Econometrics, Annual Conference, Program Committee, 2010-2013

Society for Financial Econometrics, Ad Hoc Conferences, Program Committee, 2010-2013

Wharton Financial Institutions Center, Annual Financial Risk Roundtable, Founder and Organizer, 1998-2012

Penn-Cambridge-Tinbergen Annual Conference on The Economics of Finance, Co-Founder and Organizer, 2009-2013

American Finance Association, Annual Meeting, Program Committee, 2010

Econometric Society, North American Summer Meeting, Program Committee, 2009

Econometric Society, Ninth World Congress, Program Committee, 2005

American Economic Association, Annual Meeting, Program Committee, 2004

PIER-IGIER Conference on Macro- and Financial Econometrics, Milan, Co-Chairman, 2003

National Science Foundation / National Bureau of Economic Research Time Series Conference, Chairman of the Organizing Committee and local host, 2002

Econometric Society, North American Winter Meeting, Program Committee, 2003

National Science Foundation / National Bureau of Economic Research Forecasting Seminar, Chairman, 1995-2001

National Bureau of Economic Research, Working Group on Empirical Methods in Macroeconomics and Finance, Co-Chairman, 1992-2001

Econometric Society, North American Winter Meeting, Program Committee, 1999

Econometric Society, North American Summer Meeting, Program Committee, 1993

Additional Scientific Leadership

Advisory Board, Jacobs Levy Center for Quantitative Financial Research, University of Pennsylvania, 2014-present
Advisory Board, CSDA Annals of Computational and Financial Econometrics, 2014-present
Advisory Board, CAFIN, University of California, Santa Cruz, 2013-present
Advisory Board, Center For Applied Financial Economics, University of Southern California, 2012-present
Advisory Board, Center for Applied Statistics and Economics (CASE), Humboldt University Berlin, 2010-present
Advisory Board, Real Time Data Research Center, Federal Reserve Bank of Philadelphia, 2009-present
Founding Member, International Association of Applied Econometrics, 2011
Founding Council, Society for Financial Econometrics, 2007
National Science Foundation Economics Panel, 1998-2000
American Statistical Association, Program Chair, Business and Economic Statistics Section, 1991

Public Service

Business Conditions Indicators Advisory Panel, The Conference Board, 2003-present
Chairman, Model Validation Council, U.S. Federal Reserve System, 2012-2013
Founding member, Oliver Wyman Institute, 1996-2012

Selected Grants Received

National Science Foundation (seven multi-year grants since 1990), Sloan Foundation, Guggenheim Foundation, Pew Foundation

Miscellaneous Creative Activity

Blog: *No Hesitations*, <http://fxdiebold.blogspot.com/>, 2013-present
Freely-available e-texts and related materials (continuously-evolving):
(<http://www.ssc.upenn.edu/~fdiebold/Textbooks.html>)

Econometrics (undergraduate)

Forecasting (undergraduate, graduate)

Time-Series Econometrics (graduate)

Aruoba-Diebold-Scoti Business Conditions Index, Federal Reserve Bank of Philadelphia, 2008-present,
<https://www.philadelphiafed.org/research-and-data/real-time-center/business-conditions-index>

Diebold et al. GDPplus, Federal Reserve Bank of Philadelphia, 2013-present,
<https://www.philadelphiafed.org/research-and-data/real-time-center/gdpplus>