#### **ROBERT F. ENGLE**

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### BIOGRAPHY

Robert Engle, the Michael Armellino Professor of Finance at New York University Stern School of Business, was awarded the 2003 Nobel Prize in Economics for his research on the concept of autoregressive conditional heteroskedasticity (ARCH). He developed this method for statistical modeling of time-varying volatility and demonstrated that these techniques accurately capture the properties of many time series. Professor Engle shared the prize with Clive W. J. Granger of the University of California at San Diego.

Professor Engle is an expert in time series analysis with a long-standing interest in the analysis of financial markets. His ARCH model and its generalizations have become indispensable tools not only for researchers, but also for analysts of financial markets, who use them in asset pricing and in evaluating portfolio risk. His research has also produced such innovative statistical methods as cointegration, common features, autoregressive conditional duration (ACD), CAViaR and now dynamic conditional correlation (DCC) models.

He is currently the Co-Director of the NYU Stern Volatility and Risk Institute and is the Co-Founding President of the Society for Financial Econometrics (SoFiE), a global non-profit organization housed at NYU. Before joining NYU Stern in 2000, Professor Engle was Chancellor's Associates Professor and Economics Department Chair at the University of California, San Diego, and Associate Professor of Economics at the Massachusetts Institute of Technology.

He received his bachelor of science in physics from Williams College and his master of science in physics and doctor of philosophy in economics from Cornell University. Born in Syracuse, NY, he grew up in Media, Pennsylvania, spent 25 years in San Diego, and now lives in New York.

### ACADEMIC EXPERIENCE

NEW YORK UNIVERSITY STERN SCHOOL OF BUSINESS, New York, NY Michael Armellino Professor in the Management of Financial Services, 2000-present Professor, Department of Finance, 1999

WHARTON FINANCIAL INSTITUTIONS CENTER, Philadelphia, PA Fellow, 2009-2010 Academic Year

UNIVERSITY OF CALIFORNIA, San Diego, CA

Emeritus Professor and Distinguished Research Professor, 2003 Chair, 1990-1994 Chancellors' Associates Chair in Economics, 1993-Professor, 1977 Associate Professor, 1975-1977 MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA

Associate Professor, 1975 Assistant Professor, 1969-1974

### HONORS AND AWARDS

- Honorary Doctorate, Nicolaus Copernicus University, 2018
- Honorary Doctorate, University of Johannesburg, 2018
- Honorary Doctorate, Hong Kong Polytechnic University, 2017
- Honorary Doctorate, Airlangga University, 2017
- Honorary Doctorate, Naresuan University, 2017
- Oskar-Morgenstern Medal Award, University of Vienna, 2015
- T.C. Liu Visiting Scholar position of the Becker Friedman Institute at the University of Chicago, 2013
- Member, U.S. Department of the Treasury, Office of Financial Research Advisory Committee, 2012
- Distinguished Visiting Scholar, Georgetown University McDonough School of Business, 2012
- Member, International Advisory Panel, Risk Management Institute (RMI), 2012
- Financial Engineer of the Year Award, IAFE/SunGard , 2011
- Distinguished Alumni Award, Department of Statistical Science, Cornell University, 2011
- Distinguished Visiting Scholar, UNC Chapel Hill Kenan-Flagler Business School, 2010
- Fellow, FMA (Financial Management Association International)
- Recognition Award for Distinguished Service, The American Real Estate and Urban Economics Association
- Member, Joint CFTC-SEC Advisory Committee on Emerging Regulatory Issues to investigate the "Flash Crash", 2010
- Hofstra University's Presidential Medal, 2009
- Honorary Doctorate, Williams College, 2007
- Member, World Economic Forum, 2007
- Member, National Academy of Sciences, Finance Committee, 2006
- Fellow of the Institute for Quantitative Research in Finance, 2006
- Academia Europensis Scientarum Atrium Litterarumque, European Arts and Sciences Membership, 2005
- Doctorate Honoris Causis, HEC, Paris, France, 2005
- Doctorate Honoris Causis, Université de Savoie, France, 2005
- Nobel Prize for Economics, 2003
- Doctorate Honoris Causis, University of Southern Switzerland, 2003
- Fellow, American Finance Association, 2004
- Fellow, American Academy of Arts and Sciences, 1995
- Fellow, American Statistical Association, 2000
- Fellow, the Econometric Society, 1981

### **EDUCATION**

CORNELL UNIVERSITY, Ithaca, NY Ph.D. in Economics, 1969 M.S. in Physics, 1966

WILLIAMS COLLEGE, Williamstown, MA **B.S. in Physics,** with Highest Honors, 1964

### **BUSINESS AFFILIATIONS**

Co-Director of the Volatility and Risk Institute, New York University (2009-Present)

• The center runs a seminar series, Quantitative Finance and Econometrics (QFE), a public web site and venue for visitors, post-docs and research fellows, and Vlab, which calculates volatilities and correlations every day on a wide range of assets using various methods. It produces volatility forecasts up to a year in advance.

**Co-Founding President, Society for Financial Econometrics (SoFiE),** New York University (2007-Present)

 The Society for Financial Econometrics (SoFiE) is a global network of academics and practitioners dedicated to the fast-growing field of financial econometrics. SoFiE is committed to promoting and expanding research and education by organizing annual conferences and sponsoring programs and activities in the intersection of finance and econometrics.

## Principle, Robert F. Engle, Econometric Services, 8 Frederick St., Mahopac, NY 10541

845-208-2028, englearch@netscape.net

 A personal consulting company specializing in the application of econometric methods to financial and other business needs. Current work focuses on liquidity and trading in financial markets, risk measurement and management, derivatives pricing and hedging and a variety of volatility and correlation related research tasks. Presents many lectures every year to financial practitioners around the world on topics of current interest.

### Faculty Research Associate, National Bureau of Economic Research (NBER) (1987-Present)

 Founded in 1920, the National Bureau of Economic Research is a private, nonprofit, nonpartisan research organization dedicated to promoting a greater understanding of how the economy works. The NBER is committed to undertaking and disseminating unbiased economic research among public policymakers, business professionals, and the academic community.

### Minor Partner, AlphaCrest Capital Management (2013-present)

• AlphaCrest is a cutting edge quantitative hedge fund.

### Academic Affiliate, Compass Lexecon (2010-Present)

 Compass Lexecon was formed in January 2008 through the combination of Competition Policy Associates (COMPASS) and Lexecon, two of the premier economic consulting firms in the world. For the past nine years, Compass Lexecon has been ranked as one of the leading antitrust economics firms in the world by the Global Competition Review.

Quantitative Finance Expert, Quinn Emanuel Urquhart & Sullivan, LLP, (2014-present)

 Quinn Emanuel is the largest law firm in the world devoted solely to business litigation and arbitration.

### Quantitative Finance Expert, Jones Day, (2016-present)

• Ranked among the world's most integrated law firms and best in client service, Jones Day has locations in centers of business and finance throughout the world.

### Expert, Analysis Group

• Analysis Group provides economic, financial and strategy consulting to law firms, corporations & government agencies.

### Expert, Industrial Economics, Inc, (2014-2016)

 Industrial Economics, Incorporated is a consulting firm that provides expert analysis to clients in government, business, and not-for-profit organizations.

# Chairman of the Academic Advisory Board, Morgan Stanley Equity Microstructure Grants (2004-2008)

• This board administers an academic grant program giving approximately 10 grants per year to faculty and students studying market microstructure. The winning grants are invited to present their work at a conference in the following year that is run by the AAB.

### Principle, VoLaRia, (2013-2017)

• A financial consulting company with expertise in statistical models of financial data.

## HONORARY LECTURES

- Lecture, "What's New in VLAB?" Inaugural Volatility and Risk Institute Conference, NYU, New York, NY, April 2020
- Keynote, "A Financial Approach to Climate Risk," 32nd Australasian Finance and Banking Conference, Sydney, Australia, December 2019
- Dr. RH Patil Memorial Lecture, "Financial Volatility in an Age of Geopolitical Risks," National Stock Exchange, Mumbai, India, November 2019
- Keynote, "Geopolitical Risk with Implications for Financial Stability and Credit Risk," Fifth Annual Volatility Institute Conference at NYU Shanghai, Shanghai, China, November 2019
- Lecture, "Financial Volatility and Geopolitical Risk," Risk USA, New York, NY, November 2019
- Laurent Picard Distinguished Lecture, "A Financial Approach to Climate Risk," McGill University, Montreal, Canada, October 2019
- Lecture, "Measuring the Probability of a Financial Crisis," ECB Conference on Monetary Policy: Bridging Science and Practice, Frankfurt, Germany, October 2019
- Lecture, "Measuring the Probability of a Financial Crisis," Bank of Greece, Athens, Greece, October 2019
- Panel, "Climate Change Risk: A Practitioners' View," 18<sup>th</sup> International Conference on Credit Risk Evaluation, Venice, Italy, September 2019
- Lecture, "New Results on Sustainable Investing," 18<sup>th</sup> International Conference on Credit Risk Evaluation, Venice, Italy, September 2019, September 2019
- Keynote, "A Financial Approach to Climate Risk," Energy and Commodities Finance Research

Conference, September 2019

- Lecture "Prospects of Global Financial Stability," E. Deane Kanaly Lecture at University of Oklahoma, Norman, OK, September 2019
- Lecture, "Volatility and Risk Management," Public Pension Funding Forum, New York, NY, September 2019
- Lecture, "Financial Volatility in an Age of Geopolitical Risks," 12<sup>th</sup> Annual SoFiE Conference, Shanghai, China, June 2019
- Keynote, "Financial Volatility in an Age of Geopolitical Risks," 2019 China Annual Conference & 5th Annual DUFE Xinghai Forum, Dalian, China, June 2019
- Keynote, "A Financial Approach to Climate Risk," T20 Summit, Tokyo, Japan, May 2019
- Keynote, "Financial Volatility and Geopolitical Risk," Journal Of Investment Management Spring Conference, May 2019
- Lecture, "Hedging Geopolitical based on a Multiplicative Volatility Factor Model," 11<sup>th</sup> Annual Volatility Institute Conference, NYU, New York, NY, April 2019
- Lecture, "Hedging Geopolitical based on a Multiplicative Volatility Factor Model," QFE Seminar, Volatility Institute, NYU Stern, New York, NY, April 2019
- Keynote Speaker, "A Financial Approach to Climate Risk," 15<sup>th</sup> International WEAI Conference, Tokyo, Japan, March 2019
- Lecture, "The Costs of Trading CDS in the Wake of the Lehman Bankruptcy," Macro Financial Modeling Winter Meeting, New York, NY, February 2019
- Lecture, "Prospects for Financial Stability in Chile," Central Bank of Chile, Santiago, Chile, December 2018
- Lecture, "Financial Stability in Chile and the Region," Chilean Ministry of Finance, Santiago, Chile, December 2018
- Keynote Speaker, "Risk Forecasting for the Chinese Stock Market and Financial Sector," Lujiazui Financial Risk Management Forum, Shanghai, China, November 2018
- Keynote Speaker, "Risk Forecasting for the Chinese Stock Market and Financial Sector," Volatility Institute Shanghai (VINS) Conference, Shanghai, China, November 2018
- Presentation, "Systemic Risk: 10 Years Later," 2008 Financial Crisis: A Ten-Year Review Conference, New York, NY, November 2018
- Keynote Speaker, "How Much SRISK is Too Much?" Sacred Heart University, Fairfield, Connecticut, November 2018
- Keynote Speaker, "A Financial Approach to Climate Risk," GRI Summit 2018, Toronto, Canada, October 2018
- Keynote Speaker, "How Much SRISK is Too Much?" 53rd Colombian Banking Summit, Cartagena, Colombia, August 2018
- Lecture, "Prospects for Global Financial Stability," University of Brescia, Brescia, Italy, June 2018
- Lecture, "A Financial Approach to Climate Risk," Bicocca University, Milan, Italy, June 2018
- Lecture, "How Much SRISK is Too Much" Nicolaus Copernicus University, Torun, Poland, June 2018
- Lecture, "How Much SRISK is Too Much?" Ca' Foscari University, Venice, Italy, May 2018
- Seminar, "How Much SRISK is Too Much?" Federal Reserve Bank, Washington, DC, May 2018
- Seminar, "How Much SRISK is Too Much?" Office of Financial Research, Washington, DC, May 2018
- Seminar, "How Much SRISK is Too Much?" Yale University, New Haven, CT, May 2018
- Seminar, "How Much SRISK is Too Much?" Caltech, Pasadena, CA, March 2018
- Lecture, "How Much SRISK is Too Much?" Johannesburg, South Africa, February 2018

- Keynote, "A Financial Approach to Climate Risk" FT Climate Finance Summit, New York, NY, February 2018
- Lecture, "How Much SRISK is Too Much?" Macro Financial Modeling Winter 2018 Meeting, New York, NY, January 2018
- Lecture, "Large Dynamic Covariance Matrices" 28<sup>th</sup> EC<sup>2</sup> on Time-varying Parameter Models, Amsterdam, Netherlands, December 2017
- Lecture, "How Much SRISK is Too Much?" Royal Danish Academy, Copenhagen, Denmark, December 2017
- Seminar, "A Financial Approach to Environmental Risk and Climate Change," Global Risk Institute, New York, NY, December 2017
- Keynote Speaker, "How Much SRISK is Too Much?" Hong Kong Polytechnic University, November 2017
- Lecture, "How Much SRISK is Too Much?" Zhejiang University, Hangzhou, China, November 2017
- Keynote Speaker, "How Much SRISK is Too Much?" Volatility Institute Shanghai (VINS) Conference, Shanghai, China, November 2017

• Keynote Speaker, "How Much SRISK is Too Much?" Inter-American Development Bank, Washington, DC, October 2017

- Panelist, "Evidence-based policy making: challenges and opportunities," Central European University, Budapest, Hungary, October 2017
- Seminar, "How Much SRISK is Too Much?" Central European University, Budapest, Hungary, October 2017
- Keynote Speaker, "How Much SRISK is Too Much?" Slovak Economic Association Meeting (SEAM 2017), Košice, Slovakia, September 2017
- Dinner Speaker, 2017 NBER-NSF Time Series Conference, Kellogg School of Management, Evanston, IL, September 2017
- Keynote Video Presentation, "How Much SRISK is Too Much?" IFABS Asia 2017 Conference, Ningbo, China, August 2017
- Lecture, "How Much SRISK is Too Much?" SoFiE Conference, NYU Stern, New York, NY, June 2017
- Lecture, "Systemic Risk with Endogenous Cycles," Bernoulli Lecture at the EPFL, HEC Lausanne, Switzerland, June 2017
- Lecture, "Large Dynamic Covariance Matrices," Big Data in Dynamic Predictive Econometric Modeling, University of Pennsylvania, Philadelphia, PA, May 2017
- Lecture, "Structural GARCH: The Volatility-Leverage Connection," Princeton University, Princeton, NJ, May 2017
- Lecture, "What's New In V-Lab," Volatility Institute Conference, NYU, New York, NY, April 2017
- Keynote Speaker, "Systemic Risk with Endogenous Cycles," Conference on Banks, Systemic Risk, Measurement and Mitigation, La Sapienza, Rome, Italy, March 2017
- Keynote Speaker, "Prospects of Global Financial Stability," Western Economic Association International 13th International Conference, Santiago, Chile, January 2017
- Keynote Speaker, "Prospects of Global Financial Stability," Tsinghua University, Beijing, China, November 2016
- Keynote Speaker, "Prospects of Global Financial Stability," Beihang University, Beijing, China, November 2016
- Keynote Speaker, "Prospects of Global Financial Stability," Nankai University, Tianjin, China, November 2016

- Keynote Speaker, "Prospects of Global Financial Stability," Volatility Institute Shanghai (VINS) Conference, Shanghai, China, November 2016
- Keynote Speaker, "FMA International and CBOE's Conference on Derivatives and Volatility, Chicago, IL, November 2016
- Keynote Speaker, "Dynamic Conditional Beta," Random Processes and Time Series: Theory and Applications a Conference in Honor of Murray Rosenblatt, UCSD, San Diego, CA, October 2016
- Keynote Speaker, "Prospects of Global Financial Stability," UBS Equity Derivatives Conference, New York, NY, October 2016
- Lecture, "Prospects of Global Financial Stability," Sy Syms School of Business Seminar, Yeshiva University, New York, NY, September 2016
- Lecture, "Structural GARCH: The Volatility-Leverage Connection," New Developments in Measuring and Forecasting Financial Volatility Conference, Duke University, Durham, NC, September 2016
- Keynote Speaker, "Stressing Australasian Financials," Asian Development Bank's International Conference on Financial Cycles, Systemic Risk, Interconnectedness, and Policy Options for Resilience, Sydney, Australia, September 2016
- Keynote Speaker, "Prospects of Global Financial Stability," SAP Central Bank Executive Summit, Heidelberg, Germany, July 2016
- Keynote Speaker, "Prospects of Global Financial Stability," RiskMathics Risk Mamangement & Trading Conference, Mexico City, June 2016
- Lecture, "A New Look at Liquidity," The Kyle Conference: Market Mechanisms & Their Impact, College Park, MD, April 2016
- Lecture, "A New Look at Liquidity," Q Group Spring Seminar, Washington, DC, April 2016
- Keynote Speaker, "Dynamic Conditional Beta and Global Financial Instability", Thailand Econometric Society Conference, Chiang Mai, Thailand, January 2016
- Keynote Speaker, "Looking Forward To The Risks of 2016," Volatility Institute Shanghai (VINS) Conference, Shanghai, China, November 2015
- Lecture, "Dynamic Conditional Beta and Global Financial Instability," ICDM Conference, Atlantic City, NJ, November 2015
- Lecture, "Monitoring Systemic Risk with V-Lab," Global Risk Institute Conference, Toronto, Canada, November 2015
- Lecture, "Prospects for Global Financial Stability," University of Vienna, Recipient, Oskar-Morgenstern Medal Award, Vienna, Austria, October 2015
- Lecture, "Long Run Risk Management: Scenario Generation for the Term Structure," Stevanovich Center, Chicago, October 2015
- Lecture, "Prospects for Global Financial Stability," Inter-American Bank, Washington DC, October 2015
- Lecture, "Prospects for Global Financial Stability," Cleveland Federal Reserve Bank, Cleveland, October 2015
- Lecture, "Latest Results on Systemic Risk Modeling, MFO Oberwolfach Workshop, Germany, September 2015
- Lecture, "Measuring Systemic Risk with Dynamic Conditional Beta, Brooklyn College, Systemic Risk Hub, May 2015
- Lecture, "Measuring Systemic Risk with Dynamic Conditional Beta, Columbia University, May 2015
- Lecture, "The Outlook for Financial Stability In Europe," Rome, February 2015
- Lecture, "Prospects for Global Financial Stability," Gallatin/TCH Seminar, February 2015

- Lecture, "Latest Results in Systemic Risk," WEAI, Wellington New Zealand, January 2015
- Lecture, "Structural GARCH," EC2 conference, Barcelona, December 2014
- Lecture, "Forecasting Illiquidity," Market Microstructure, Paris, December 2014
- Lecture, "Dynamic Conditional Beta: Some New Results," French Econometrics Conference, December 2014
- Lecture, "Monitoring Systemic Risk with V-Lab, SAIF Shanghai, November 2014
- Speaker at launch of Volatility Institute Shanghai (VINS), November 2014
- Lecture, "Prospects for Global Financial Stability," University of Macau, November 2014
- Lecture, "Prospects for Global Financial Stability," Hong Kong Polytechnic University, November 2014
- Invited Workshop Panelist, "The Economic and Financial Risks of a Changing Climate," Resources for the Future (RFF)/American Association for the Advancement of Science (AAAS), New York, NY, November 2014
- Keynote Speaker, "US and China in a Shifting Global Economic Order: A Finance Perspective at TCFA's 20th Anniversary," The Chinese Finance Association (TCFA) 20<sup>th</sup> Annual Conference, November 2014
- Lecture, Lecture in Honor of 100<sup>th</sup> Anniversary of TC Liu's Birth, Cornell University, Ithaca, NY, October 2014
- Lecture, Honorary Patronage Award, Trinity College, University Philosophical Society, Dublin, Ireland, September 2014
- Lecture, "Monitoring Systemic Risk: Data, Models and Metrics" at Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, September 2014
- Keynote speaker at Banque de France, ACPR, and SoFiE joint sponsored conference on Systemic Risk and Financial Regulation in Paris, "Structural GARCH: The Volatility-Leverage Connection," July 2014
- Keynote speaker at 1<sup>st</sup> International Conference on Sovereign Bond Markets conference in Tokyo, "The Global Outlook on Systemic Risk," June 2014
- Lecture, ISEO Summer School Italy, June 2014
- Lecture, "Nobel Laureate Robert Engle: A Financial Approach to Environmental Risk," Resources For the Future – Washington, DC, March, 2014
- Keynote speaker at Risk Minds Conference Amsterdam, December 2013
- Keynote speaker at the 26th Australasian Finance and Banking Conference, Australia, December 2013
- Keynote speaker at Federal Reserve Conference on Capital Adequacy, November 2013
- Keynote speaker at "Recent Advances in Commodity Markets" conference, London, November 2013
- Keynote speaker at IV International Meeting "Chile Towards Development" as guest (with Nouriel Roubini (New York University); Jeffrey Sachs (Columbia University); Michael Boskin (Stanford University); Laurence Kotlikoff (Boston University); and Barry Eichengreen (University of California – Berkeley)) of Treasury Minister Felipe Larraín, October 2013
- Keynote speaker at the Macro Financial Modeling and Macroeconomic Fragility Conference, "Structural GARCH: The Volatility-Leverage Connection", Boston, October 2013
- Keynote speaker at The Institute for New Economic Thinking and China's Tsinghua University conference, "The Good Life: The Challenges of Progress in China," Shenzhen, September 2013
- Keynote speaker at the First International Conference SYRTO Project, "Monitoring Systemic Risk with V-Lab", Brescia, June 2013
- Keynote speaker at The NYU Stern Global Alumni Conference & the NYU Stern China Policy Summit, Shanghai, June 2013

- Keynote speaker at 30<sup>th</sup> International French Finance Association Conference, Lyon, May 2013
- Panel speaker at the Bloomberg Washington Summit, "The Investor Confidence Game", Washington, DC, April 2013
- Keynote speaker at WEAI 10<sup>th</sup> Biennial Pacific Rim Conference, Tokyo, March 2013
- Keynote speaker at World Economic Forum, Davos, January 2013
- Host at breakfast for central bankers in Davos, January 2013
- Keynote Speaker, 25th Australasian Finance and Banking Conference, "Regional Financial Stability: Systemic Risk, Liquidity Risk, and Governance", Sydney, December 2012
- Keynote speaker on "Global Financial Stability and Systemic Risk Today" at Luigi Solari Conference, University of Geneva, November 2012
- Keynote speaker on "European Systemic Risk" at 4<sup>th</sup> French Econometrics Conference, ENSAI, Rennes, November 2012
- Presentation titled, "Volatility and Systemic Risk" at Bendheim Center Princeton Lectures in Finance, Princeton, October 2012
- Keynote speaker at Conference on Systemic Risk and Data Issues– DC, October 2012
- Keynote speaker on "Systemic Risk Today: Measurement and Regulation" at G20 Conference on Financial Systemic Risk– Istanbul, September 2012
- Presentation titled, "How Does Systemic Risk Look Today" at PRIMIA Global Risk Conference– New York City, May 2012
- Presentation titled, "When and How to Play Defense: Strategies for Volatile Markets" at Common Fund Conference– Orlando, March 2012
- Presentation titled, "Volatility, Correlation and Tails for Systemic Risk Management" at Risk Minds Conference – Geneva, December 2011
- Presentation titled, "Volatility, Regulation and Systemic Risks" at International Forum on Financial Risk – Toronto, October 2011
- Speaker, European Colloquia Italy, September 2011
- Presentations titled, "Financial Institutions Systemic Risk and Innovation" and "Volatility Correlations and Tails", at RBA/BIS Conference - Australia, June 2011
- Columbia University's 17<sup>th</sup> Annual Workshop on Financial Engineering: Quantitative Trading and Asset Management (presentation on NYU's Systemic Risk Rankings) – Columbia University, November 2010
- Luncheon Address titled "Counterparty Risk and Dodd-Frank" at the NYU-DTCC Conference titled "Managing Counterparty and Systemic Risk Under Dodd-Frank" – New York University, November, 2010
- Plenary Address titled "Volatility Where Are We Going?" and Workshop titled "Global Financial Stability and Long Run Risks", at the South African Statistical Association (SASA) Conference – South Africa, November 2010
- Keynote Speech on "NYU Stern Systemic Risk Ranking" at the 13<sup>th</sup> Conference of the European Central Bank (ECB) – Center for Financial Studies (CFS) Research Network on "Macro-Prudential Regulation as an Approach to Contain Systemic Risk: Economic Foundations, Diagnostic Tools and Policy Instruments" – Frankfurt, September 2010
- Scientific Seminar on Financial Econometrics Tinbergen Institute, Amsterdam, September 2010
- Keynote Address titled "Global Financial Stability and Long Term Risk" for the Global Derivatives 2010 Conference – Paris, France, May 2010
- Eötvös Loránd University Budapest, December 2009
- Hungarian National Bank Budapest, December 2009
- Nobels Colloquia in Trieste Italy, December 2009

- Derivatives 2009: Looking Towards the Future NYU Salomon Center, November 2009
- Global Summit for the World Economic Forum Dubai, November 2009
- Nobel Chair for Taiwan National Central University Taipei, November 2009
- Taiwan Stock Exchange Taipei, November 2009
- Science and Innovation Week Mexico, September 2009
- New Economics School Moscow, August 2009
- Asociación de Economistas de América Latina y el Caribe Cuba, March 2009
- Stanford Institute for Economic Policy Research (SIEPR), February Associates Meeting: "What is Happening to Financial Market Volatility and Why?" – February, 2009
- Speaker/Participant at the World Economic Forum Davos, January 2009
- International Peace Foundation: "Bridges Dialogues Towards a Culture of Peace" Bangkok, December 2008
- Lecture on "High Dimension Dynamic Correlations" at HIS joint with OeNB Vienna, December 2008
- Speaker/Participant at Nobels Colloquia Trieste, December 2008
- Conference on Multivariate and Extremes Oxford University, November 2008
- NY Quantitative Finance Seminar November 2008
- Conference at Bendhiem October 2008
- New York Academy of Sciences Conference Mexico, September 2008
- NBER/NSF Aarhus University September 2008
- Research Seminar, University of Savoie France, March 2008
- Speaker/Participant at Nobels Colloquia in Trieste December 2007
- Lecture on "High Dimension Dynamic Correlations" at HIS joint with OeNB Vienna, December 2007
- Keynote speaker at ISEO European Colloquia and Pioneer Investment Vienna
- Panel Discussant on Volatility TOPIC: The Fed's role & the impact of financial turmoil on the real economy with Tom Cooley and Mickey Levy, Chief Economist of Bank of America -November 2007
- Public Lecture at Universidad Carlos III Madrid, Spain. October 30, 2007
- Master Lecture at Foundation Rafael Del Pino Madrid, Spain, October 29, 2007
- Keynote Speaker at the Multivariate Volatility Models Conference Faro, Portugal, October 26, 2007
- Keynote Address and Official Opening Remarks for the FMA 2007 Annual Meeting Orlando, Florida, October 17, 2007
- Lecture titled "Vector Multiplicative Error Models: Representation and Inference" at the Princeton Conference on Likelihood Methods – Princeton, NJ, October 2007
- Keynote Speaker for the Journal of Investment Management Conference Series Boston, MA., September 2007
- Invited talk "DECO: Dynamic Equicorrelation Models for Large Correlation Matrices" at the 2007 European meeting of the Econometric Society Budapest, Hungary, August 2007
- Keynote Speaker for the Conference 2007 International Symposium on Financial Engineering and Risk Management (FERM2007) - Beijing 11-12, June 2007
- Speaker Address titled "Volatility, Downside Risk, Portfolio Models, and VAR" Distinguished Lecture Series at KAIST Graduate School of Finance - Seoul, South Korea
- Lecture on "Global Financial Volatility" at the Chancellor's Distinguished Lecture Series at University of California – Riverside, May 2007
- Speaker at the Inaugural Rady School Finance Conference May 2007
- Public Lecture at University of Technology Sydney, Australia, April 12, 2007

- Speaker Address titled "Global Financial Volatility", European Central Bank Frankfurt, Feb. 5, 2007
- Speaker Address titled "Global Financial Volatility", Swiss National Bank Zurich, Feb. 2, 2007
- Lecture on "Anticipating Correlations", Manchester Business School Manchester, UK., Jan. 31, 2007
- Lecture on "Execution Risk", Morgan Stanley Conference London School of Economics, London, Jan. 30, 2007
- Panel Presenter at the World Economic Forum Davos, Switzerland, January 2007
- Lecture at the Econometrics Conference at Yale University New Haven, Connecticut, Dec. 2, 2006
- Keynote speech at Ukrainian National University Kiev, Ukraine, Oct. 13, 2006
- Lecture on "Measuring and Modeling Execution Cost and Risk", Time Series Conference Montreal, Quebec, Sept. 29, 2006
- Lecture at the University of Florence, Sept. 15, 2006
- Lecture on "Global Financial Volatility", Lindau Foundation Germany, Aug. 16, 2006
- Speaker at the International Symposium on Forecasting Santander, Spain, June 12, 2006
- Speaker at INSEAD Paris, France, June 9, 2006
- Lecture at Hautes Etudes Commerciales Université de Lausanne, June 8, 2006
- Lecture on "Execution Risk" Paris Microstructure, June 6, 2006
- Edmund R. Mechalik Distinguished Lecture in the Mathematical Sciences, "Global Volatility: It's Measurement, Interpretation, and Causes" - University of Pittsburgh, April 7-9, 2006.
- Speaker: "Downside Risk and its Implications for Financial Management", Q-Group Conference – Institute for Quantitative Research in Finance, West Palm Beach, Florida, March 31-April 3, 2006
- Speaker: "Financial Volatility Causes, Consequences, and Global Patterns", Midwest Economics Association – Chicago, March 24-25, 2006
- Will Mann Richardson Lectureship Austin College, March 3-5, 2006
- Lecture and Workshop on "Execution Risk" University of Toronto, Feb. 17-19, 2006
- Host, Monday Quantitative Finance & Econometrics Seminars: Stern School of Business NYU. On-going
- Keynote speaker "Allied Social Science Association's Annual Convention, KUU Conference, American Economic Association - Boston, MA., January 6-8, 2006
- Public Lectures at Chongquing University, Wuhan University, Huanzang University, National Taiwan University, TABF Inauguration, NBER Trio Conference, Tokyo University - December 2005
- "A Brief History of Time", Economics Roundtable for University of California San Diego, August 2005
- Keynote Speaker: "Underlying Dynamics of Credit Correlations", Risk Magazine Quant Congress - New York, NY, November 8, 2005.
- Hedge Fund Lecture Principal Speaker on "Measuring Downside Risk": IXIS NYU Banking Conference Series on Hedge Funds - September 2005
- Stern Honors Society Lecture, Stern School of Business New York University, November 3, 2005
- Opening Address: "The Spline GARCH Model for Unconditional Volatility and its Global Macroeconomic Causes", Statistical and Applied Mathematical Sciences Institute Conference -Duke University, North Carolina, September 2005
- "Downside Risk Econometric Models and Financial Implications", ASTIN AFIR Conference - Zurich, Switzerland, September 2005

- Key Note Speaker, International Conference on Finance University of Copenhagen, Denmark, September 2005
- Chair Speaker, Econometrics Society World Congress London, England, August 2005
- "MBS and Credit Derivatives The Recent Development", 13<sup>th</sup> annual PBFAE Conference -Rutgers University, New Brunswick, June 10, 2006
- Lecture: Changing Structures in International and Financial Market ant the Effects on Financial Decision Making - Venice, Italy, June 2 & 3, 2005
- Lecture on "Frontiers in Time Series Analysis", Journal of Applied Econometrics Annual Conference, Sardinia, Italy - May 29-31, 2005
- Financial Econometrics Conference University of Montreal, May 19th, 2005
- Induction Ceremony Key Note Speaker, Penncrest High school May 18<sup>th</sup>, 2005
- Keynote Speaker, Morgan Stanley Equity Market Microstructure Research Conference May 12<sup>th</sup>-13<sup>th</sup>, 2005
- Paper presentation on Microstructure, National Bureau of Economic Cambridge, MA., May 6, 2005
- "Stern Scholar in the Parlor", Hosted by Leonard Stern, Stern School of Business April 20<sup>th</sup>, 2005
- "Statistics Day", University of Maryland Conference on Statistics April 15th, 2005
- Federal Reserve System's Fourth Annual Community Affairs Research Federal Reserve Bank of New York, April 8<sup>th</sup>, 2005
- Lecture: Citigroup Conference April 6<sup>th</sup>, 2005
- "Dean's Roundtable Luncheon", Stern Executive Board, Stern School of Business NYU, April 5<sup>th</sup>, 2005
- Presentation on "Testing and Valuing Dynamic Correlations for Asset Allocation", Research Conference for Corporate Associates. Stern School of Business – NYU, April 2005
- Public Lecture: Budapest Collegiums, "Downside Risk: Implications for Financial Management", European Cultural Foundation - March 23, 2005
- Lecture on "Downside Risk: Implications for Financial Management", the Czech National Bank, Czech Economic Society and CERGE-EI - March 17, 2005
- Lecture: "A Simple GARCH Approach to Default Correlations", International Association of Financial Engineers - New York, NY., March 2, 2005
- "Cutting Edge Innovations and Derivatives", Credit Suisse First Boston First Annual Meeting, March 2005
- Joint lunch of the AEA/AFA Annual Meeting Philadelphia, 2004
- Econometric Institute/Princeton University Press lecture series Erasmus University, 2003
- Nobel Lecture Stockholm, 2003
- Fields Lecture University of Toronto, 2001
- Conference Honoree and Keynote Address, "International Conference on Modeling and Forecasting Financial Volatility" - Perth, Australia, 2001
- Lecture Series, Finnish Statistical Association Meeting Vassa, Finland, 2001
- Journal of Applied Econometrics Lecture Series Cambridge, England, 2001
- Lecture Series, Academica Sinica Taiwan, 2000
- A.W. Phillips Lecture, Australasian Meetings of the Econometric Society Melbourne, 1997
- Fisher Schultz Lecture, European Meeting of the Econometric Society Istanbul 1996
- Frank Paish Lecture, Annual Meeting of the Royal Economic Society Swansea 1996
- Pareto Lecture, Annual Meeting of ASSET Istanbul, 1995

## **RESEARCH PUBLICATIONS**

Engle has published well over 100 academic research papers, four books and many other scholarly works. These are mostly in the broad area of time series econometrics with the most important applications to financial markets. Over the years, Engle's authored influential papers analyzing macro economics, energy markets, urban economies and emerging markets as well as the main financial asset classes: equities, currencies, fixed income and derivatives. Two of his papers have reached milestones in citations: the paper introducing the *ARCH* model in 1982 and the paper coauthored with Clive Granger introducing *Cointegration*, in 1987. These two papers were honored in "Citation Classics" as two of the most cited of all papers in economics. They were also the two papers forming the basis for the 2003 Nobel Prize.

The most heavily cited papers are listed below. For more listings, see sections <u>Working Papers</u>, <u>Expository Papers</u>, <u>Books & Book Chapters</u> and a <u>Complete Listing of Chronological Publications</u>.

- "Dynamic Conditional Correlation A Simple Class of Multivariate GARCH Models," Journal of Business and Economic Statistics (July 2002), V20N3 (cited by 2,898 as of September, 2014)
- "Multivariate Simultaneous Generalized ARCH," (with Kenneth F. Kroner), *Econometric Theory*, Vol. 11, No. 1 (1995) (cited by 2,988 as of September, 2014)
- "Measuring and Testing the Impact of News on Volatility", *The Journal of Finance*, Vol. 48, No. 5 (Dec, 1993) (cited by 3,088 as of September, 2014)
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- "Aspects of Regional Financial Stability: A Policy Approach," (with Fariborz Moshirian and Bohui Zhang) (October 2014)
- "The Conditional CAPM Explains the Value Premium," (with Turan G. Bali) Social Science Research Network (SSRN) (November 2012)
- "Liquidity, Volatility, and Flights to Safety in the U.S. Treasury Market: Evidence from a New Class of Dynamic Order Book Models," (with Michael Fleming, Eric Ghysels, and Giang Nguyen), (June 2012)
- "And Now, The Rest of the News: Volatility and Firm Specific News Arrival," (with Martin K. Hansen and Asger Lunde), (March 2012)

- "Volatility, Correlation and Tails for Systemic Risk Measurement," (with Christian T. Brownlees), (2011)
- "When Is Noise Not Noise A Microstructure Estimate of Realized Volatility," (with Zheng Sun) (2007)
- "Fitting and Testing Vast Dimensional Time-Varying Covariance Models," (with Kevin Sheppard and Neil Sheppard) (2007)
- "Forecasting Variance of Variance: The Square-root, the Affine and the CEV GARCH Models," with Isao Ishida under revision
- "Theoretical Properties of Dynamic Conditional Correlation Multivariate GARCH," (with Kevin Sheppard) (2005)
- "Evaluating the Specification of Covariance Models for Large Portfolios," (with Kevin Sheppard) (2005)
- "Time-Varying Betas and Asymmetric Effects of News: Empirical Analysis of Blue Chip Stocks," (with Young-Hye Cho) - under revision
- "Modeling the Impacts of Market Activity on Bid-Ask Spreads in the Option Market," (with Young-Hye Cho) - under revision
- "Macroeconomic Announcements and Volatility of Treasury Futures," (with Li Li) under revision
- "Conditional Volatility of Exchange Rates Under a Target Zone," (with Yin-Feng Gau) under revision

## **EXPOSITORY PAPERS**

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- "Risk and Volatility: Econometric Models and Financial Practice," Nobel Lecture, (2004) American Economic Review, V94M3 pp 405-420
- "Grappling with GARCH," (with Joseph Mezrich), RISK (1995): 112-117
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- Robert Engle, Turan G. Bali and Scott Murray, "Empirical Asset Pricing: The Cross Section of Stock Returns (Wiley Series in Probability and Statistics," (Wiley Publishers, 2016)
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- Robert Engle, "What is Happening with Financial Market Volatility and Why?," in *Volatility Risk and Uncertainty in Financial Markets* (Zicklin School of Business Financial Markets Series, Springer Science + Business Media, 2011), chapter 3.
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