

CURRICULUM VITAE

Albert S. "Pete" Kyle

Date: March 21, 2018 (Some material updated to March 2015)

Current Position: Charles E. Smith Chair Professor of Finance, Robert H. Smith School of Business

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Personal: Born March 11, 1952, Memphis, TN; U.S. Citizen; married, four children

EDUCATION

- University of Chicago, 1977-1979, 1980-1981. Ph.D., Economics, 1981.
Dissertation: "An Equilibrium Model of Speculation and Hedging."
Advisors: José Scheinkman (chair), Robert E. Lucas, Lester Telser.
- Nuffield College, Oxford University, 1976-1977. Field: Economics. Advisor: James Mirrlees.
Met all requirements for B.Phil. degree (now called M.Phil.) except two-year residency requirement.
- Merton College, Oxford University, 1974-1976. B.A. and M.A., Mathematics and Philosophy, 2nd class honors, 1976.
- Davidson College, 1970-1974. B.S. Mathematics, summa cum laude.

CAREER

- Charles E. Smith Chair Professor of Finance (with tenure), Robert H. Smith School of Business, University of Maryland, August 2006 to Present.
- Olaf Stenhammar Visiting Professor, Stockholm Institute for Financial Research, September 2009.
- Professor of Finance and Economics (with tenure), Duke University, Fuqua School of Business and Dept. of Economics, January 2002 - 2006 (appointment predominantly in Fuqua School of Business)
- Visiting Professor, Said Business School, Oxford University (St. Edmund Hall), June 2004, June 2005, June 2006, June 2007, June 2008.
- Visiting Scholar, Princeton University, Department of Economics, Fall 2004 (while on sabbatical leave from Duke University).
- Consultant, Morgan-Stanley and Company, December 1996 - December 1998, full time while on unpaid leave from Duke University, Process Driven Trading (PDT) Group.
- Associate Professor of Finance (with tenure), Duke University, Fuqua School of Business, July 1992-July 2002 (on unpaid leave for calendar years 1997,1998).
- Associate Professor of Finance (with tenure), University of California at Berkeley, Haas School of Business, July 1990-June 1992.
- Visiting Scholar, Duke University, Fuqua School of Business, September 1991-June 1992 (on sabbatical leave from UC Berkeley, Fall 1991).
- Assistant Prof. of Finance, Univ. of California at Berkeley, Haas School of Bus., July 1987-June 1990.
- Assistant Prof. of Economics and Public Affairs, Woodrow Wilson School, Princeton Univ., 1981-87.
- Visiting Fellow, Yale School of Organization and Management, Spring 1984 (on sabbatical leave from Princeton University).
- Visiting Research Fellow, Centre of Policy Studies, Monash University, Australia, Fall 1983 (on sabbatical leave from Princeton University).
- Pit Trading and Risk Management, Goodman-Manaster and Company, Chicago, 1979-1980.
- Staff Economist, Chicago Board of Trade, part-time, 1978-1979.

PUBLICATIONS IN REFERRED JOURNALS

(In co-authored articles, all authors have equal seniority and approximately equal contribution.)

- Avinash K. Dixit and Albert S. Kyle, "The Use of Protection and Subsidies for Entry Promotion and Deterrence," American Economic Review, Vol. 75, No. 1, 1985, pp. 139-152.
- Albert S. Kyle, "Continuous Auctions and Insider Trading," Econometrica 53, 1985, 1335-1355.
- Albert S. Kyle, "Improving the Performance of the Stock Market," California Management Review, 30:4, Summer 1988, 90-114.
- Peter R. Hartley and Albert S. Kyle, "Equilibrium Investment in an Industry with Moderate Investment Economics of Scale," The Economic Journal, 99:396, June 1989, 392-407.
- Peter R. Hartley and Albert S. Kyle, "Real Rates and Home Goods: A Two Period Model," The Economic Record, 64:186, September 1988, 168-177.
- Albert S. Kyle, "Informed Speculation with Imperfect Competition," Review of Economic Studies 56:3, No. 187, July 1989, 317-356.
- Albert S. Kyle and Jean Luc Vila, "Noise Trading and Takeovers," Rand Journal of Economics, Vol. 22, No. 1, Spring 1991, pp. 54-71.
- John Y. Campbell and Albert S. Kyle, "Smart Money, Noise Trading, and Stock Price Behavior," Review of Economic Studies 1993, 60 pp. 1-34.
- Albert S. Kyle and Albert Wang, "Speculation Duopoly with Agreement to Disagree: Can Overconfidence Survive the Market Test?" Journal of Finance, volume LII, number 5, December 1997, pp. 2073-2090.
- Albert S. Kyle and Wei Xiong, "Contagion as a Wealth Effect," Journal of Finance, volume LVI, No. 4, August 2001, pp. 1401-1440.
- Albert S. Kyle, Hui Ou-yang, and Wei Xiong, "Prospect Theory and Liquidation Decisions," Journal of Economic Theory, Elsevier, vol. 127 (1), July 2006, pp. 273-288.
- Albert S. Kyle, Hui Ou-yang, and Bin Wei, "A Model of Portfolio Delegation and Strategic Trading," Review of Financial Studies, 2011.
- Albert S. Kyle and Anna A. Obizhaeva, "Market Microstructure Invariance: Empirical Hypotheses," Econometrica, vol. 84, no. 4, July 2016, pp. 1345-1404 .
- Albert S. Kyle, Anna A. Obizhaeva, and Mark Kritzman, "A Practitioner's Guide to Market Microstructure Invariance," Journal of Portfolio Management, vol. 43, no. 1, Fall 2016, pp. 43-53.
- Andrei Kirilenko, Albert S. Kyle, Mehrdad Samadi, and Tugkan Tuzun, "The Flash Crash: High Frequency Trading in an Electronic Market," Journal of Finance, June 2017, pp. 967-998..
- Albert S. Kyle and Jungsuk Han, "Speculative Equilibrium with Differences in Higher Order Beliefs," Management Science, 2017.
- Albert S. Kyle and Jeongmin Lee, "Toward a Fully Continuous Exchange," Oxford Review of Economic Policy, 2017, Vol. 33, No. 4, pp. 650-675. IS-2017-105 Provisional Patent Application Appln. No.: 62/541,274, filed on August 4, 2017.
- Albert S. Kyle, Anna A. Obizhaeva and Yajun Wang, "Smooth Trading with Overconfidence and Market Power," Review of Economic Studies. 2018. Vol. 85, pp. 611-652..
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CHAPTERS IN BOOKS

- Albert S. Kyle, "Imperfect Competition, Market Dynamics, and Regulatory Issues," in Financial Markets and Incomplete Information: Frontiers of Modern Financial Theory: Vol. 2, edited by Suddipto Bhattacharya and George M. Constantinides, Rowman and Littlefield, 1989, 153-161.
- Albert S. Kyle, "A Theory of Futures Market Manipulations," The Industrial Organization of Futures Markets, edited by Ronald W. Anderson. Lexington, Mass., Lexington Books, 1984, pp. 141-173, also reprinted in Paul Weller (editor), The Theory of Futures Markets, Blackwell, 1992 pp. 272-303.
- Albert S. Kyle, "How to Implement Contingent Capital", in Apres le Deluge: Finance and the Common Good after the Crisis, edited by Ed Glaeser, Tano Santos, and E. Glen Weyl, 2017, University of Chicago Press, pp. 73-121.

PUBLICATIONS IN UNREFEREED CONFERENCE VOLUMES

- Albert S. Kyle, "Trading Halts and Price Limits," The Review of Futures Markets, 7:3, 1988, 426-434.
- Albert S. Kyle, "Market Structure, Information, Futures Markets, and Price Formation," in International Agricultural Trade: Advanced Readings in Price Formation, Market Structure, and Price Instability, ed. by Gary G. Storey, Andrew Schmitz, and Alexander H. Sarris, Boulder, Westview, 1984, pp. 45-64.
- Albert S. Kyle, "Discussion of 'The Pricing of Oil and Gas: Some Further Results'," (by Merton Miller and Charles Upton), The Journal of Finance, Papers and Proceedings, Vol. 40, No. 3, July 1985, 1018-1020.
- Peter R. Hartley and Albert S. Kyle, "The Economics of Medical Insurance," in Medical Care and Medical Ethics, edited by C.L. Buchanan and E.W. Prior. Winchester, Mass., Allen & Unwin Inc., 1985, pp. 77-104.
- Albert S. Kyle and S. Viswanathan, "How to Define Illegal Price Manipulation," American Economic Review Papers and Proceedings, 98:2, May 2008, pp. 274-279.
- Mark Flood, H. V. Jagadish, Albert Kyle, Frank Olken, Louiqa Raschid, "Using Data for Systemic Financial Risk Management," 5th Biennial Conference on Innovative Database Systems Research (CIDR 2011): January 9-12, 2011, Asilomar, California, USA.

MISCELLANEOUS PUBLISHED ARTICLES

- Albert S. Kyle and Terry A. Marsh, "Computers and the Crash: Is Technology the Problem or the Solution?" Institutional Investor Financial Technology Forum 2, June 1988, pp. 6-7.
- U.S. Securities and Exchange Commission, Office of Inspector General, Office of Audits, "SEC's Oversight of Bear Stearns and Related Entities: The Consolidated Supervised Entity Program," September 25, 2008 (Report No. 446-A). ("The OIG retained an expert, Albert S. (Pete) Kyle to provide assistance with this audit.")
- The Financial Economists Roundtable, "Statement of the Financial Economists Roundtable: Reforming the OTC Derivatives Markets," Journal of Applied Corporate Finance, Vol. 22, 2010 (drafting committee Albert S. Kyle, Chester Spatt, and Darrell Duffie).
- Albert S. Kyle, "A commentary on 'Déjà Vu All Over Again: The Causes of US Commercial Bank Failures This Time Around.'" Journal of Financial Services Research (2012): 1-4.
- U.S. Securities and Exchange Commission, Office of the Inspector General, Office of Audits, Follow-up Review of Cost-Benefit Analyses in Selected SEC Dodd-Frank Rulemakings. January 27, 2012. Report No. 499. (Note: As a consultant to the SEC, I drafted much of this document.)

UNPUBLISHED PAPERS

- Albert S. Kyle, "A Rational Expectations Model of Equilibrium in Speculative Markets with Imperfect Liquidity and Costly Information," Thesis seminar and job-market paper, 1980.
- Albert S. Kyle, "The Efficient Markets Hypothesis and the Supply of Speculative Services," manuscript, 1982.
- Albert S. Kyle, "An Equilibrium Model of Speculation and Hedging," University of Chicago Ph.D. Dissertation (Economics), 1981.
- Peter R. Hartley and Albert S. Kyle, "Equilibrium in a Model with Lumpy Investment," manuscript (now subsumed in "Equilibrium Investment in an Industry with Moderate Investment Economies," 1983.
- Avinash K. Dixit and Albert S. Kyle, "On the Use of Trade Restrictions for Entry Promotion and Deterrence," Economics Discussion Paper No. 56, Woodrow Wilson School, Princeton University, 1983.
- Albert S. Kyle, "Equilibrium in a Speculative Market with Strategic Informed Trading," (revised as "Informed Speculation with Imperfect Competition). 1983.
- Albert S. Kyle, "Informational Efficiency and Liquidity in a Continuous Auction Futures Market," Centre

- for the Study of Futures Markets, Columbia Business School, Working Paper Series #CSFM-75, 1984.
- Albert S. Kyle, "An Explicit Model of Smart Money and Noise Trading," manuscript (now subsumed in "Smart Money, Noise Trading, and Stock Price Behavior), 1985.
 - Albert S. Kyle, "An Intuitive Introduction to Agency Theory with Applications to Money Management," Q-Group Talk, manuscript, April 1989.
 - Albert S. Kyle and Ailsa Roell, Comments on Recent Developments and Proposals Concerning Dealing Practices in the UK Equity Market," manuscript, 1989.
 - Albert S. Kyle and Terry A. Marsh, "On the Economics of Securities of Clearing and Settlement," manuscript, 1993.
 - Albert S. Kyle, "On Incentives to Acquire Private Information with Continuous Trading," manuscript, 1985.
 - Albert S. Kyle, "Dealer Competition Against an Organized Exchange," manuscript, June 1987.
 - Albert S. Kyle, "Market Failures and the Regulation of Financial Markets," manuscript, 1992.
 - Gerard Genotte and Albert S. Kyle, "Intertemporal Insider Trading with a Smooth Order Flow," manuscript, 1993.
 - Albert S. Kyle and Tao Lin, "Continuous Speculation with Overconfident Competitors," manu., 2002.
 - Albert S. Kyle and Tao Lin, "An Analysis of Excessive Trading Volume with Different Beliefs," manuscript, 2002.
 - Albert S. Kyle and Rujing Meng, "Strategic Acquisitions and Investment in a Duopoly Patent Race under Uncertainty," manuscript, 2003.
 - Ming Guo and Albert S. Kyle, "An Intemporal Asset Pricing Model with Strategic Informed Trading and Risk-Averse Market Makers," manuscript, 2004.
 - Albert S. Kyle, "A Two-Factor Model of Value and Growth with Adjustment Costs," manuscript, 2004.
 - Alex Boulatov and Albert S. Kyle, "Uniqueness of Equilibrium in the Single-Period Kyle-85 Model," manuscript, 2005.
 - Albert S. Kyle, "Cash Settlement, Price Manipulation, and the Modigliani-Miller Theorem," manuscript, 2008.
 - Mark D. Flood, Albert S. Kyle, and Louiqa Raschid, "Knowledge Representation and Information Management for Financial Risk Management: Report of a Workshop," November 29, 2010, Available at SSRN: <http://ssrn.com/abstract=1718808>.
 - Albert S. Kyle, Anna A. Obizhaeva, Nitish Ranjan Sinha, Tugkan Tuzun, "News Articles and Equity Trading," 2017, previously titled "News Arrival and Trading Game Invariance," First Draft: August 5, 2010; This Draft: March 14, 2011
 - Jungsuk Han, Mariana Khapko, and Albert S. Kyle, "Liquidity with High-Frequency Market Making," March 2014.
 - Albert S. Kyle, Anna A. Obizhaeva, Tugkan Tuzun, "Market Microstructure Invariance in U.S. Stock Market Trades," 2016, previously titled "Trading Game Invariance in the TAQ Dataset," May 9, 2011.
 - Albert S. Kyle and Anna A. Obizhaeva, "Market Microstructure Invariants: A Dynamic Model," original manuscript, 2010, most recent version 2016.
 - Albert S. Kyle and Anna A. Obizhaeva, "Large Bets and Stock Market Crashes," manuscript, first draft 2012, current version 2016.
 - Albert S. Kyle, Anna A. Obizhaeva, and Yajun Wang, "A Market Microstructure Theory of the Term Structure of Asset Returns" first draft 2013, current version 2014.
 - Kyoung-hun Bae, Albert S. Kyle, Eun Jung Lee, and Anna A. Obizhaeva, "An Invariance of Buy-Sell Switching Points," 2016.
 - Torben Andersen, Oleg Bondarenko, Anna A. Obizhaeva, and Albert S. Kyle, "Intraday Trading Invariance in the E-mini S&P 500 Futures Market," February 2015.
 - Albert S. Kyle and Jeongmin Lee, "Information and Competition with Symmetry," 2017.
 - Albert S. Kyle, Anna A. Obizhaeva, and Yajun Wang, "Beliefs Aggregation and Returns Predictability"

2016, revise and resubmit, Journal of Finance.

- Albert S. Kyle and Anna A. Obizhaeva, “Dimensional Analysis and Market Microstructure Invariance,” 2016, revise and resubmit, American Economic Review.

RESEARCH CONTRACTS AND GRANTS

- Research Consultant, Bell Laboratories, 1982.
- Research Associate, Center for the Study of Futures Markets, Columbia Business School, two months of summer support, 1983.
- Principal Investigator, NSF Grant (Information Science): "Organized Exchanges, Dealer Markets, and Anonymous Trading," Princeton University, Two summers of summer support, 1985, 1986.
- Academic Visitor, Federal Reserve Bank, Washington, D.C., June 6-10, 1992.
- Academic Visitor, Federal Reserve Bank, Atlanta, GA, 5 days, 2003.
- Consultant, Commodity Futures Trading Commission, high frequency trading in stock index futures, 2009-2010.
- NSF, Co-Investigator, Workshop on Knowledge Representation and Information Management for Financial Risk Management (with Louiqa Raschid and Mark Flood), 2010-2011.

FELLOWSHIPS, PRIZES, AND ACADEMIC AWARDS

- Phi Beta Kappa, Davidson College, 1974.
- Honorary Postmastership, Merton College, 1976-1977.
- George Webb Medley Prize in Economics, Merton College, Oxford University, 1976.
- Rhodes Scholarship (Texas), Davidson College, 1974-1977.
- Schwabacher Fellowship, Haas School of Business, 1988-1989.
- Batterymarch Fellowship, 1990-1991.
- NSF Graduate Fellowship, University of Chicago, 1977-1979, 1980-1981.
- Keynote Speaker, Western Finance Association, Park City, Utah, June 25, 2002, “Market Microstructure.”
- Keynote Speaker, Twelfth Annual Conference on The Theories and Practices of Securities Markets, National Sun Yat-sen University, Kaohsiung, Taiwan, “Insider Trading and Corporate Governance,” December 17, 2004.
- Assurant Lecture, Assurant/Georgia Tech International Finance Conference, “Market Microstructure and Rational Expectations: A Primer,” April 8, 2005.
- Fellow, Econometric Society, 2002-present.
- Clarendon Lectures in Finance, Oxford University, June 2006.
- Member, Financial Economists Roundtable, 2007.
- First Prize, The Q-Group, Roger F. Murray Prize, for the paper “Market Microstructure Invariants” (with Anna Obizhaeva), 2009.
- University of Maryland, Graduate Faculty Advisor of the Year Award, 2010.
- First Prize, The Q-Group, Roger F. Murray Prize, for the paper “The Flash Crash: The Impact of High Frequency Trading on an Electronic Market (with Andrei Kirilenko, Mehrdad Samadi, and Tugkan Tuzun), 2012.
- Top 15 percent teaching award, 2012.
- Honorary Doctoral Degree, Stockholm School of Economics, 2013.
- Elected Fellow of the American Finance Association, 2014.

PROFESSIONAL SERVICE

- NBER Research Associate, 1982-1985.
- Institute for the Study of Securities Markets, Member, Board of Directors, 1988-1992.
- Ecole Nationale des Ponts et Chaussees, Visiting Lecturer, two-week finance course, 1991, 1992, 1993.
- CEPR Summer Institute, Gerzensee, Switzerland, Participant, July 11-23, 1993.
- Frankfurt University, Guest Lecturer, Ph.D. lectures on market microstructure, Aug 13-15, 1999.
- Rhodes Scholarship Selection Committee, Illinois (1979, 1980), Florida (1998, 1999, 2000, 2001, 2002).
- American Finance Association, Board of Directors, Member, 2004-present.
- NASDAQ, Economic Advisory Board, Member, 2005-2007.
- FIRN (Australian Research Council Research Network on Financial Integrity), Melbourne Business School, Melbourne, Australia, one week Ph.D. course on market microstructure, May 30 to June 4, 2008.
- Financial Economists Roundtable, Member, 2007-present. Drafting committee, 2009, 2014.
- CFTC Technology Advisory Committee, 2010-2011.
- Financial Crisis Inquiry Commission, testimony and informal briefings, 2010.
- FINRA, Economic Advisory Board, member, 2009-2014
- Fellows Workshop for Law and Economics, Columbia University, Member, 2011-2014.
- Shadow Financial Regulatory Commission, Member, 2012-2014.
- Academic Visitor, U.S. Securities and Exchange Commission, one week, 2014.

SELECTED CONSULTING

- Goodman-Manaster and Company, 1981. Futures trading, risk management.
- Pepper, Hamilton, and Scheetz, 1984-1986, expert witness. Railroad deregulation. Reports with Robert Willig.
- Consultants in Industry Economics, Inc. 1983-1986, 1988, expert witness. Anti-trust.
- New York Stock Exchange, 1987, 1990, consultant. Market surveillance, insider trading.
- Commodity Futures Trading Commission, 1986-1989, expert witness. Hunt silver market manipulation. Report.
- Staff Member, Presidential Task Force on Market Mechanisms (Brady Commission), 1987-1988. Stock market crash of 1987, stock index futures, index arbitrage, portfolio insurance.
- Options Clearing Corporation, 1989. Clearing and settlement.
- Berkeley Financial Technologies, 1989-1991. Lectures on futures and options.
- Expert witness for Robert Griffin, 1991. Angelo et al vs. CFTC (Treasury Bond Futures tick size). Report and testimony.
- Law and Economics Consulting Group, 1991, manipulation.
- BARRA, 1991, measuring market liquidity.
- The Long Term Credit Bank of Japan, 1991-1996 interest rates and derivatives pricing.
- National Economic Research Associates, 1996, expert witness, securities fraud, damages.
- Salomon Brothers (Wachtell, Lipton, Rosen and Katz), 1991-1992, expert witness. Cocoa futures trading, damages. Deposition.
- Internal Revenue Service, 1996. Expert witness. Treasury Bond Futures trading.
- Justice Department, 1996. Expert witness. NASD market maker competition and tick size.
- Chase Securities, 2000, Foreign Exchange Order Flow
- Expert Witness, Alleged Price Manipulation of NYMEX Electricity Futures Involving Cash-Settled OTC Derivatives, 2003-2004. Report.
- Expert Witness, Barrick Gold Corporation, 2004-2005, 2008, price manipulation, damages.
- U.S. Department of Justice, consultant on merger of CME and CBOT, 2007

- Office of the Inspector General, Securities and Exchange Commission, external consultant on the collapse of Bear Stearns, 2008.
- U.S. Department of Justice, credit derivatives, 2009-2010.
- Office of the Inspector General, Securities and Exchange Commission, external consultant on the use of cost-benefit analysis in rulemaking for the Dodd-Frank Act, 2011.
- Non-executive Director, Arrowstreet Capital, Limited Partnership, 2013-present.

CURRENT RESEARCH INTERESTS

- Market Microstructure Invariance.
- Smooth Trading.
- Differences in Higher Order Beliefs.
- Measurement of Transactions Costs, Trading with Transaction Costs.
- Trading Volume and Overconfidence
- Industry Dynamics and Valuation of Firms: An Integration of Corporate Finance and Industrial Organization.
- Cash Settlement, Market Manipulation, and the Modigliani-Miller Theorem Applications of Numerical Techniques in Finance.
- Financial Contagion.
- Algorithms for Pricing Interest rates and Derivative Assets.