

## **DAVID K.A. MORDECAI**

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### **EDUCATION**<sup>1</sup>

University of Chicago Graduate School of Business, Ph.D. Economics and Econometrics/Statistics, 2004

New York University, Leonard N. Stern Graduate Business School, MBA Finance, 1987

The King's College, B.A. Philosophy/Humanities (Comparative Religion), 1983

### **PROFESSIONAL EXPERIENCE/EMPLOYMENT**<sup>2</sup>

Numerati<sup>®</sup> Partners LLC (<https://numeratipartnersllc.com/>), Co-Managing Member, 2012-Present

Risk Economics<sup>®</sup>, Inc. (<https://riskeconomicsinc.com/>), President, 1999-Present

Swiss Re Financial Markets, Managing Director – Relative-Value Market Strategies, 2007-2008

Clinton Group Inc., Managing Director – Structured Products, 2001-2003

American International Group (AIG), Vice President – Financial Engineering/Principal Finance, Global Investments Group/Structured Products 2000-2001; Vice President – Financial Engineering/Executive Committee, AIG Risk Finance Division 1998-2000

Fitch IBCA, Director, Commercial Asset-Backed Securities (ABS) Group, 1997-1998

Westdeutsche Landesbank, Vice President, Leveraged Capital Group, 1990-1991

Emanuel & Company, Vice President – Corporate Finance, 1988-1990

Bankers Trust Associate – Corporate Finance, 1987-1988

NatWest NJ Commercial Credit Analyst, 1984-1986

### **CONSULTING/ADVISORY ASSIGNMENTS**<sup>2</sup>

Analysis Group: Affiliated Expert 2022-Present

Colorado Attorney General Senate Bill 217 Pattern & Practice Investigation Technical Appendix, 2020-2021

FinTech Startup Technical Advisory Committees: ForwardLane 2018-Present; AlphaPoint 2016-Present

Compass Lexecon: Senior Advisor/Affiliate 2009-2014, 2022-Present; Advisory Committee 2011-2014

Swiss Re Financial Services and Capital Management Divisions, 2007

Shinsei Bank, 2006

Bartlit Beck Palenchar Herman & Scott, 2005-2006

S3 Asset Management/S3 Partners, 2005

HUD Diversified Mortgage CDOs, 2003

McDonald's Corporation USA, Technical Advisor to Chief Operating Officer North America Division, 1996

Credit Suisse First Boston (CSFB) High Yield, Leveraged Capital, and Financial Products, 1995

NYU Salomon Center for the Study of Financial Institutions, 1993

Bank of Montreal/Harris Bank and Trust, 1993

Pfizer; Hoffman-La Roche, 1992

Mutual Benefit Life; PSE&G/Deloitte; ADP, 1992

Asea Brown Boveri (ABB); Metromedia Communications, 1992

Den Norske Creditbank, 1986-1987

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<sup>1</sup> See Appendix I for a summary of relevant post-graduate education; University of Chicago GSB was renamed Booth in 2008; previously NYU GBA was renamed Stern in 1988.

<sup>2</sup> See Appendix II for highlights of technical and financial markets assignments  
David K.A. Mordecai, PhD

## PATENTS

### **US Patent # 7925581, 8032451, 8812397**

*System and method for dynamic path- and state-dependent stochastic control allocation:* The invention includes a system and process that employs contractual bargaining with agent-based computational methods for the dynamic allocation, optimization, and pricing of contingent rights and obligations between multiple counterparties with overlapping interests.

## EDITORIAL EXPERIENCE<sup>3</sup>

- Senior Editorial Advisory Board Member, *Journal of Risk Finance*, Emerald Publications, 2004-Present
- Founding Editor-in-Chief, *Journal of Risk Finance*, Euromoney Institutional Investor, 1998-2004
- Editorial Advisory Board, *Journal of Alternative Investments*, Euromoney Institutional Investor, 2004-2008
- Advisory Committee, *The Impact of Credit Derivatives on Securities Markets*, International Securities Markets Association (ISMA), 1998

## PROFESSIONAL ACTIVITIES

- American Bar Association (ABA) Science & Technology Law, Space Law Co-Chair 2022-24
- ABA Science & Technology Law, Nanotechnology Chair 2021-24; Vice Chair 2020-21
- ABA Science & Technology Law, AI & Robotics Committee Vice Chair 2018-2022
- ABA Technical Advisor Appointed to Uniform Law Commission (ULC) Study Committees: Use of Tokens or Other Similar Products in Real Property Transactions 2022-Present; Mitigation of Public Health Emergency Business Disruptions 2020; Event Data Recorders in Cars 2019-Present
- Advisory Board for the Institute for Data Science (IDAS) at Durham University 2019-Present
- National Institute of Standards & Technology (NIST) *Position Navigation and Timing (PNT) Profile Industry Workshop* on Vulnerability of GPS/GNSS as a Single Point of Failure, Invited Participant 2020
- New York Academy of Sciences (NYAS) Artificial Intelligence (AI) Initiative Discussion Group on Public-Sector AI and Advanced AI Policy, Invited Participant 2020
- Peer review of Sloan Foundation Grant Proposal for funding a Cyberphysical Security Evaluation Effort, Invited Referee 2019
- NSF Northeast Big Data Hub Cybersecurity Committee, Co-Chair, 2018-2019
- AIG-NYU Partnership on Innovation for Global Resilience, Steering Committee Member, 2013-Present
- FinTech Innovation Lab (Partnership Fund for New York City and Accenture), *Scientist-in-Residence*, 2013-Present
- NYU Stern Graduate School of Business, Senior Research Scholar, Computational Economics of Law, Commerce, and Geo-Politics, 2012-2015
- NYU Center for Data Science Faculty Working Group, 2012
- NYU Courant Institute of Mathematical Sciences, Visiting Scholar; RiskEcon<sup>®</sup> Lab for Decision Metrics (<https://wp.nyu.edu/riskeconlab/>), Primary Senior Research Advisor, 2011-Present
- NYU Courant Institute of Mathematical Sciences, Computational Economics and Algorithmic Data Analytics Initiative affiliated with RiskEcon<sup>®</sup> Lab, 2011-Present
- NYU Courant Institute of Mathematical Sciences, Advisory Board, Mathematical Finance, 2010-Present
- International Association of Financial Engineers (IAFE) Advisory Board, 2001-Present<sup>4</sup>
- Founding Co-Chair IAFE Liquidity Risk Committee, 2005-2013
- IAFE Investor Risk Committee Steering Group, 2001-2013

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<sup>3</sup> See Appendix III for a synopsis of relevant technical topics reviewed during tenure as Editor-in-Chief of *Journal of Risk Finance*.

<sup>4</sup> On October 13, 2013, the International Association of Financial Engineering (IAFE) announced that the organization had been renamed the International Association of Quantitative Finance (IAQF).

## **PROFESSIONAL ACTIVITIES (CONT'D)**

- Board on Mathematical Sciences and Their Applications Division on Engineering and Physical Sciences National Research Council of the National Academies, Invited Presenter 2011
- Office of the Directorate of National Intelligence Systemic Risk Working Group, Invited Participant 2010
- National Academy of Sciences Working Group on Systemic Risk 2009, Technical Capabilities Necessary for Systemic Risk Regulation (Board on Mathematical Sciences and Their Applications, Invited Participant)
- Santa Fe Institute, Systemic Risk Initiative Symposium/Workshop 2009, Organizing Committee, and Speaker
- World Economic Forum Working Group on Systemic Risk 2009, Invited Participant
- Family Office Association Palm Beach Forum, Invited Participant 2018
- Federal Reserve Bank of Atlanta/IAFE 2006 *Modern Financial Institutions, Financial Markets and Systemic Risk*, Organizing Committee, Session Chair, and Discussant
- GAIM/IAFE Systemic Risk Symposium 2006, Session Co-Chair/Organizing Committee Chair
- GAIM *Advanced Topics in Structured Credit*, Session Chair, 2004-2006
- GAIM USA *Advanced Topics in Structured Credit*, Session Chair, 2006
- University of Chicago GSB Geo-Political Finance Forum 2005 Session Chair *Financial Intermediation, Innovation and Global Financial Stability: The Role of Regulatory Policy, Derivatives, and Securities in Geo-Political Finance*
- Wharton Financial Institution Center/Mercer Oliver Wyman Financial Risk Symposia, Participant, 2001, 2002
- National Bureau of Economic Research (NBER) Insurance Industry Working Group, Participant, 1999-2009
- NBER Risk in Financial Institutions Working Group, Participant, 2005-2012
- New York Mercantile Exchange (NYMEX) Institutional Investment Management Advisory Board Steering Committee Member, 1998-2003

## **MEMBERSHIPS**

- American Bar Association 2010-Present; American Economic Association 1998- ; American Finance Association 1998- ; New York Association of Business Economists 2007- ; American Law & Economics Association 2013- , National Association of Business Economists, 2012-
- IEEE 1998-2001, 2013-Present; Association of Computing Machinery 2011-Present; New York Academy of Sciences 2012-Present; American Statistical Association 2012- Present; SIAM 2013-Present; NDIA 2018-Present; AFCEA 2018- ; International Society of Bayesian Statistics 2013-Present; INFORMS/NY 1998-2005

## **FELLOWSHIPS/HONOR SOCIETIES/AWARDS**

- *Who's Who in Finance and Industry* (Marquis), various editions
- *Who's Who in Business* (Marquis), various editions
- *Who's Who in the World* (Marquis), various editions
- *Who's Who in America* (Marquis), various editions
- *Who's Who Among African-Americans* (Gale)
- *Minority & Women Doctoral Directory*
- Sir Harold Acton Society (philanthropy in STEM and the establishment of RiskEcon<sup>®</sup> Lab at Courant NYU)
- Beta Gamma Sigma Honor Society
- University of Chicago Doctoral Fellowship, 1993-2004
- Salomon Center Research Fellowship, 1993
- NYU GBA Dean's Service Award 1987; Chase Manhattan Fellowship 1986
- The Society of Distinguished American High School Students, 1977

## EXPERT TESTIMONY

- Catapult IP Innovations, Inc. v. BlackBerry, Limited, JAMS No. 5425001101, technology intellectual property portfolio sale dispute, M&A reinsurance; expert report and rebuttal damages report filed (October 2023).
- Douez v. Facebook, Inc., In The Supreme Court of British Columbia, Vancouver Registry, VLC-S-S-122316. Expert testimony provided related to the determination of class size; expert report filed (August 2023).
- American Arbitration Association arbitration (confidential) re: VLSI supply-chain and volatility-based damages analysis for Bitcoin token mining ASIC rig capacity contract dispute; expert report filed (June 2023), testified at deposition (July 2023) and at arbitration (October 2023).
- Lehman et al. v. Transbay Joint Powers Authority (TJPA), Millennium Tower Association v. Mission Street Development, LLC et al, and related cases In the Superior Court of the State of California, County of San Francisco, Case Number: CGC 17-557830. TJPA joined by Millennium Tower Association (MTA) in opposing the summary judgment motion filed by the engineering related to successor liability from its 2010 acquisition via an asset purchase agreement (APA) of the geotechnical engineering firm for the Millennium Tower, expert report filed and testified at deposition (February 2019).
- MF Global Holdings Ltd., as Plan Administrator v. PricewaterhouseCoopers, In the United States District Court Southern District of New York Case No. 14-cv-2197 (VM), expert reports filed (August and November 2015).
- MF Global Holdings Ltd. Investment Litigation, Joseph Deangelis (Tavakoli) v. Corzine et al, In the United States District Court Southern District of New York 12 MD 2338 (VM), 11 Civ. 7886 (VM), expert reports filed August and September 2015, testified at deposition (November 2015).
- Microsoft v. Samsung, Civil Action No. 14-CV-6039; re: merger dispute related to intellectual property assignment; expert report filed (December 2014).
- Starr International Company v. United States, In the United States Court of Federal Claims, No. 11-CV-00779; re: evaluating the economic and market evidence corresponding to the financing extended to rescue AIG, expert report filed (April 2014), testified at deposition (June 2014) and at trial (November 2014).
- Offshore Exploration and Production, LLC v. Korea National Oil Corporation and Ecopetrol S.A., In the American Arbitration Association International Centre For Dispute Resolution; re: common market practice and convention for trading fixed income instruments within the context of a Stock Purchase Agreement and an Indemnification Escrow Agreement; the recognition of interest income as it relates to premium bonds; commercial reasonability of investor expectations regarding returns on Treasury-backed investments, expert report filed (December 2013), testified (February 2014) and supplement submitted (August 2015).
- Technical advisor in international arbitration involving Benelux bancassurance conglomerate; re: an econometric model, based upon well-established statistical methodology and generally accepted industry practice, to identify a portfolio of peer banks with comparable exposures, based upon contemporaneous market prices and relative returns, technical appendix submitted with report filed (November 2013).
- Anwar et al. v. Fairfield Greenwich Limited, et al., In the United States District Court Southern District of New York, Master File No. 09-CV-118; re: commercial reasonability of investor expectations re: due diligence and monitoring roles of manager relative to fund administrator and custodians, expert report filed (October 2013), testified at deposition (April and May 2014), supplemental report filed (September 2014).
- Retirement Housing Foundation et al v. ACA Financial Guaranty; Cain Brothers & Co. LLC and DOES 1-20 inclusive, Superior Court of Los Angeles County, California, Case No. BC404726, declaration filed in opposition to Cain Brothers' statute of limitations motion for summary judgement in a swap contract dispute (signed April 2013; filed May 2013).
- Ironshore Insurance Ltd v. Western Asset Management Company No. 11 Civ. 5954 (LTS)(JCF), In the Federal Court of Southern District of New York Case No: 1:2011cv05954; re: topics related to the valuation, performance attribution and stress testing of fixed income portfolio management assignment on behalf of a property-casualty insurer; expert report (March 2013) and rebuttal report filed (April 2013), testified at expert deposition.

## **EXPERT TESTIMONY (CONT'D)**

- Eastham Capital Appreciation Fund v. KPMG LLP, Arbitration; re: commercial reasonability of investor expectations re: due diligence and monitoring roles of manager relative to fund auditor duties, expert report filed (April 2013).
- City of Phoenix v. Ambac Assurance Corporation, MBIA Insurance Corporation, Inc., and Financial Guaranty Insurance Company, Case No. CV 2010-00555-PHX-TMB; re: insurance risk factors and comparative economics between financial guaranty insurance referencing municipal, corporate and structured finance; expert report and rebuttal report filed (April and May 2013).
- Sheila M. Gowan, Chapter 11 Trustee for Dreier LLP v. Amaranth Advisors L.L.C. and Amaranth Partners LLC. In the United States Bankruptcy Court Southern District of New York, Chapter 11 Case No. 08-15051 (SMB); re: commercial reasonability of due diligence performed; expert report filed on (November 2012), rebuttal report filed (January 2013), testified at deposition.
- HSH Nordbank AG, v. UBS AG and UBS Securities LLC, In the Supreme Court of the State of New York County, New York, Case No. 6000562/08; re: Actively Managed Synthetic CDO structure referencing RMBS; testified at deposition (July 2011).
- Genetically Modified Rice Litigation, Multidistrict litigation, In the United States District Court, Eastern District of Missouri, Eastern Division, Case No. 4:06 MD 1811 CDP; re: economic damages from alleged contamination of U.S. rice crop; testified at deposition (April 2011).
- API, Inc. Asbestos Settlement Trust and A.P.I. Inc. v. Zurich-American Insurance, In the United States District Court of Minnesota, Case No. 09-CV-00975 JRT/JJG et al.; re: finite reinsurance involving commercial liabilities of insurer in runoff, testified at deposition (March 2011).
- MAXXAM Inc. v. Timothy C. Ford and Kevin D. Laurie, FINRA Arbitration No. 09-5147CH; re: cause and foreseeability related to failure of Lehman sponsored Auction Rate Securities at arbitration; testified (on behalf of Ford and Laurie as respondents) at arbitration (January 2011).
- Scott Meins, et al. v. Bayer AG, et al., In the Circuit Court of Arkansas County, Arkansas, Stuttgart District, Civil Division, Case No. CV-2008-108; re: damages from alleged contamination of U.S. rice crop; reports filed, testified at deposition (January 2011).
- Amaranth LLC et al. v. J.P. Morgan Chase & Co. et al., In the Supreme Court of the State of New York County, New York, Case No. 603756/07; expert report filed, testified at deposition November 2010.
- Jesse Briggs, et al. vs. Bayer Cropscience, LP, et al., In the Circuit Court of Jefferson County, Arkansas, Case No. CV-2009-173-5; re: damages from alleged contamination of U.S. rice crop; reports filed, testified at deposition (September 2010).
- Doyle Sims, et al. v. Bayer Cropscience, LP, et al., In the Circuit Court of Desha County, Arkansas, Civil Division, Case No. CV-2009-118-3, (damages from alleged contamination of U.S. rice crop; reports filed, testified at trial on behalf of Bayer defendants (July 2010).
- Abu Dhabi Commercial Bank et al v. Morgan Stanley & Co. et al Civil Action No. 1:08-cv-07508 re: Cheyne SIV; rebuttal response declaration supporting plaintiff's motion for class certification (April 2010).
- Frontier Oil Corporation v. National Union Fire Insurance of Pittsburgh PA et al., In the Central District Superior Court of Los Angeles County, California, Case No. BC311259, (finite reinsurance case), declarations filed, testified at deposition (January 2010) and at trial (April 2010) on behalf of defendant RLI Insurance.
- Fifth Third v. TransAmerica Insurance Company, In the Southern District Court of Ohio, Western Division, Case No. 1:08 CV 269; re: Separate Account Bank-Owned Life Insurance (BOLI); expert report filed (December 2009), testified at deposition (January 2010).
- Tyson Partners, L.P. (f/k/a Altaris Partners), LLC vs. AIG Global Asset Management Holding Company, (re: industry practice with regard to private equity joint-venture capital call funding obligations and the economics of those obligations; expert report filed, testified at Arbitration (September 2009).

## ARTICLES/PUBLICATIONS

**Technical Pre-prints Posted** (2020- : See <https://wp.nyu.edu/riskeconlab/about/research/>)

Rohith G. Ganesan, Samantha Kappagoda, Giuseppe Loianno, and David K.A. Mordecai (2021) *Comparative Analysis of Agent-Oriented Task Assignment and Path Planning Algorithms Applied to Drone Swarms* (arXiv:2101.05161)

Ryan C. Saxe, Samantha Kappagoda, and David K.A. Mordecai (2020) *Classification of Pathological and Normal Gait: A Survey* (arXiv:2012.14465)

Mengheng Xue, Samantha Kappagoda, and David K.A. Mordecai (2020) *Energy Disaggregation with Semi-supervised Sparse Coding* (arXiv:2004.10529)

### **Doctoral Dissertation**

“*The Limits of Arbitrage: An Empirical Analysis of Evidence from Hedge Fund Performance*” developed and employed an application of multivariate principal component analysis to perform econometric tests of decision and control problems related to risk management and capital allocation for dynamic relative-value trading strategies. Examines how the performance and risk-based leverage of hedge funds pursuing diverse active trading strategies respond to volatility shocks. The decomposition of hedge fund performance into risk-based leverage factors, and the estimation of response functions of contingent liabilities to volatility shocks, also addresses broad market and policy implications regarding externalities, contagion effects, and systemic risk management across both diverse trading strategies and asset classes.

### **Published Chapters**

“Applications of Structured Correlation Products to Credit Risk Intermediation” in Tilman, L. M. (Ed.), *Asset Liability Management of Financial Institutions*, Institutional Investor Books, 2003

“The Role of Hedge Funds as Asset Managers in Pension Life Annuity and Property-Casualty Reinsurance Covers” in Lane, M. (Ed.), *Alternative Risk Strategies*, RISK Books, 2002

“Insurance Risk Securitization, Model Robustness, and the Convergence of Event and Credit Risk: A Rating Analyst’s View,” in Himmick, M, and S. Bouriaux (Eds.), *Securitized Insurance Risk: Strategic Opportunities for Insurers and Investors*, Glenlake Publishing Company, 1999

“The Use of Credit Derivatives in Credit-Enhanced and Credit-Linked Structured Notes: A Former Rating Analysts Perspective,” Francis, J., J. Frost, and G. Whittaker (Eds.), *The Handbook of Credit Derivatives*, McGraw-Hill, 1999

“Alternative Risk Transfer: Investing Directly in Insurance Risk as an Alternative Investment Strategy,” Schneeweis, T. and J.F. Pescatore (Eds.), *The Handbook of Alternative Investment Strategies*, Institutional Investor Books, 1999

“Event Risk Management and Arbitrage: Synthetic Credit Structures” in Lake, Ron (Ed.), *Credit Derivatives: Applications for Risk Management*, Euromoney Books, 1998

“Emerging Market Credit Derivatives and Default Estimation: Volatility, Business Cycle Correlation and Portfolio Diversification” (with S. Kappagoda) in Jameson, R. (Ed.), *Credit Derivatives: Applications for Risk Management, Investment and Portfolio Optimisation*, Risk Books, 1998

## **ARTICLES/PUBLICATIONS (CONT'D)**

### **Articles**

“The Critical Role of Transmission and Storage Capacity in Balancing Intermittent Generation and Transient Load” American Bar Association (ABA) *Natural Resources & Environment* Winter 2023

“Uncertainty and Reliability Implications of Computer Vision Depth Estimation for Vehicular Collision Avoidance and Navigation (Parts 1 & 2),” (with Samantha Kappagoda and John Y. Shin), ABA *SciTech Lawyer Unintended Consequences Issue*, Fall 2022 & Winter 2023

“Automated Personal Assistants with Multiple Principals: Whose Agent is it?” ABA *SciTech Lawyer* Winter 2020

“Weather Derivatives: A Tool for All Trades” *Energy and Power Risk Management* and RISK Special Issue, RISK Publications, 1998

“Limited Liability for Lloyd’s” *Barrons* (Editorial), 1985

### **Case Studies**

“Forward Pricing of Corresponding Aging, Mortality and Medical Trends” Swiss Re, 2008

“Finance for an Italian Library of Movies,” (with G. Pini) Fitch IBCA, 1998

“Swiss Re Earthquake Fund,” Fitch IBCA, 1998

“Residential Reinsurance Limited/United States Automobile Association,” Fitch IBCA, 1997

“The Restructuring of International Harvester into Navistar,” NYU Stern GBA, 1987

“Japan’s Big Bang: How Deregulation and Global Entry into the Japanese Securities Industry Contributed to the Revaluation of the Nikkei and Japanese Real Estate,” NYU Stern GBA, 1986

### **Working Papers Organized by Topic**

#### **Systemic Risk**

Consumption-Based Forward Pricing of Insurance and Pension Risk

A Comprehensive Framework for Consistent and Coherent Forward Pricing of Systemic Risk

#### **Risk Management and Risk Finance**

“Forging Best Practices in Risk Management” U.S. Treasury Office of Financial Research (OFR) Working Paper #2 (with Paul Glasserman, Cliff Rossi, and Mark J. Flannery), 2012

“Computational Limits of Arbitrage and Market Externalities: The Implications of Search and Matching Costs on the Market Dynamics of Carry Trades”

“To Search but (perhaps) Not Find: Systemic Risk, Network Externalities, and Counterparty Coordination Failure in a Multi-Agent Capacity Game with Random Shocks and Stochastic Arrival of Types”

“Risk Finance and Risk Shifting by Strategic Traders: A Multi-Period Model of Disintermediation with Information Asymmetry, Contingent Liability, and Asset Substitution”

“Market Conditions and the Limits of Arbitrage: Hedge Fund Performance and the Leverage Implicit in Dynamic Trading Strategies,” University of Chicago, 2000

## **ARTICLES/PUBLICATIONS (CONT'D)**

“A Model of Debt Capacity and Borrowing Capacity for Performance-Based Arbitrage,” University of Chicago, 2000

“When Does Size Matter? The Role of Collateralized Financing in the Performance of Hedge Funds and CTAs,” University of Chicago, 2000

“The Race to Exit: A Three Period Model of Arbitrageur Leverage Changes in a Competitive Dealer Market with Costly Monitoring,” University of Chicago, 2000

“The Efficient Pricing, Allocation and Distribution of Event Risk in the Reinsurance and Capital Markets,” University of Chicago, 1999

“Event Uncertainty, Price Dispersion, and the Quality of Risk Premia: The Equilibrium Pricing of Event Risk in the Reinsurance Markets,” University of Chicago, 1998

“The Pricing of Intermediated Event Risk: An Analysis of the Dual Market Pricing of Comparable Risks,” University of Chicago, 1998

“Criteria for Rating Catastrophic Risk Securities,” Fitch IBCA, 1997

### **Bayesian Approach to Option Valuation**

“A Hierarchical Model of Black-Scholes with Stochastic Volatility: Monte Carlo Tests of Pricing Bias Sensitivity to Model Parameters,” University of Chicago, 1997

“A Hierarchical Model of Black-Scholes with Stochastic Volatility” (with C. Harris and D. Pelleg), University of Chicago, 1994

### **Statistical Credit Risk and Default Estimation**

“A Cash Flow Volatility Based Characteristics Model for Estimating Default Proximity of Franchise Loan Syndication,” Fitch IBCA, 1998

“Fundamental Determinants of High Yield Bond Yields,” University of Chicago, 1996

“An Analysis of the Capital Market Response to HLT lending Regulation: Evidence from Abnormal Returns,” University of Chicago, 1996

“The Application of the Stein Estimator to Predicting Industry Distress for Pricing and Asset Allocation Within a Portfolio” (with D. Glickman), University of Chicago, 1995

“Industry-Driven Determinants of Default for Asset Sale LBO’s in the 1980’s,” University of Chicago, 1994

“The Default Premium and the Role of High Yield Debt in the 1980’s,” University of Chicago, 1994

“A Review of the Methodology and Selected Results from ‘Business Conditions and Expected Returns on Stocks and Bonds by Fama-French (1989)’” (with D. Glickman), University of Chicago, 1994

“An Analysis of the Impact of HLT lending Regulation on Distress Costs for Highly Levered Firms” (with Berg, Goulet, Lyman and Whitney), University of Chicago, 1994



## **ARTICLES/PUBLICATIONS (CONT'D)**

### **Empirical Corporate Finance/Capital Structure Theory**

“A Model of Interdependence and Conflicting Incentives Between Bankers and Analysts,” University of Chicago, 1996

“The Five Percent Rule: Stigler’s Capture Theory and the Ownership of Non-Financial Firms by Banks,” University of Chicago, 1995

“An Experimental Framework for Testing the Relationship Between Commitment Escalation and Coalition Formation with Sunk Cost”, University of Chicago, 1995

“Evidence That Takeover Targets Overinvest: The Implications for Organizational Escalation of Commitment,” University of Chicago, 1995

“An Analysis of Overinvestment and Diversification by Takeover Targets,” University of Chicago, 1994

“Voluntary Corporate Spinoffs,” University of Chicago, 1994

## **INVITED PRESENTATIONS/PLENARY ADDRESSES**

- Transformative Impact of AI on the Legal Profession, *Generative AI Tools: How Transformation Occurs*, and *Navigating the Future: Including AI and the Changing Regulatory Landscape*, Invited Panelist 2023
- NYU School of Law, The Future of AI & the Law: Risks, Opportunities and Challenges, *Artificial Intelligence (AI) in Financial Services: Cementing Industry Gains Through Governance and Guardrails*, Invited Panelist 2023
- Cournot Centre *The Modeling of Markets with Complex and Rough Regimes*, Session Chair 2022
- Colorado Bar Association Panel *Perspectives from an Expert Witness* moderated by Eric Olson, Solicitor General, Office of the Colorado Attorney General, Invited Panelist 2021
- Institute of International Bankers (IIB) Panel *Climate Change Scenario Analyses*, Invited Panelist 2021
- Courant Institute for Mathematical Sciences NYU Center for Atmosphere Ocean Science (CAOS) Atmosphere Ocean Science Colloquium Presentation *Multi-resolution Remote-Sensing and Data Fusion for Multi-Modal Estimation of Mesoscale Terrestrial Atmospheric Scattering Fields: Statistical Models and Applications to Risk Domains*, Invited Presenter 2021
- American Bar Association (ABA) Artificial Intelligence and Robotics National Institutes Conference (AINI) *Data Dump: How to Deal with a Heap of AI Big Data Liability and Compliance Issues* Invited Panelist, 2021
- ABA AINI Conference *Investigations in the Era of AI*, Invited Panelist 2020
- ABA SciTech Section Virtual CLE Panel, Invited Panelist 2019
- ABA-IPL Annual Meeting and 34<sup>th</sup> Intellectual Property Law Conference, Invited Panelist 2019
- ABA-IPL Privacy Committee Dinner (discussing topics in cybersecurity), Invited Keynote 2019
- W3C Workshop on Data Models for Transportation *Digital Forensics for Measurement and Control and the Vehicle Testimony and Behavior Implications for Cyberphysical Risk Reliability and Security of Internet of Things (IoT)*, Invited Presenter 2019
- U.S. Department of Defense/ONR HacktheMachine Lightning Presentation, Invited Presenter 2019
- U.S. Commodity Futures Trading Commission’s (CFTC) Second Annual Fintech Forward Conference Panel (discussing frameworks and criteria to enable reliable Artificial Intelligence), Invited Panelist 2019
- Center for Strategic and International Studies (CSIS) Defense Industrial Initiatives Group (DIIG) Senior-Level Discussion Workshop Sessions, *Artificial Intelligence (AI) and Applications to National Security*, on tactical and strategic issues of data ownership, software acquisition and network risk management for trust, verification and reliability of AI systems, Invited Participant 2018

## INVITED PRESENTATIONS/PLENARY ADDRESSES (CONT'D)

- Day Pitney Family Office Forum 2018, Invited Panelist 2018
- InsurTech Alliance Science and Engineering Innovation Expo, Keynote Speaker 2018
- New England Conference of Public Utilities Commissioners (NECPUC) Symposium, *Hair-Raising Hazards; Analytical Frameworks for Risk & Catastrophic Events. Hair Raising Hazards from AI, ML & IoT: Adaptive Response to Cyberphysical Risks*, Invited Panelist 2018
- Armed Forces Communications and Electronics Association (AFCEA) 2018 Internet of Things (IoT) Summit, *IoT Procurement: Assembling the Pieces*, Invited Panelist 2018
- NYU Joint Quantum Symposium, *Future of Quantum Information*, Invited Panelist 2018
- AFCEA, *Artificial Intelligence: The Next Line of Defense*, Invited Panelist 2018
- Accenture Insurtech Summit, *Big Data: The Oxygen of Life Underwriting*, Invited Panelist 2017
- Family Office Association Annual Conference, Invited Keynote Speaker 2017
- National Governors Association *Industrial Internet of Things* (“IIoT”) Forum, Invited Participant 2017
- Global Association of Risk Professionals (GARP) Panel, *What Blockchain Means for Risk Management*, 2016
- SwissNex New York Outpost *The Power of Big Data: Shaping the Future of FinTech*, Invited Panelist 2016
- RIMS 2016 Annual Conference, *Adaptive Response to Cyberphysical Infrastructure Risk: The State of the Art Cyber Terrorism: Protecting Critical Infrastructure*, Invited Panelist 2016
- Accenture Technology Vision, *People First: The Primacy of People in the Digital Age*, Invited Panelist 2016
- American Association of State Compensation Insurance Funds (AASCIF) Annual CEO Conference, Invited Presenter 2015
- Workers Compensation Fund (WCF) Senior Management Annual Meeting, Invited Presenter 2015
- AASCIF Annual Conference *Bridging the Future*, Invited Presenter 2015
- AASCIF Mid-Year CEO Conference, Keynote 2015
- Reinsurance Association of America *Supply-Chain Risks and Contingent Business Interruption: Forensic RiskTech for Reinsurers as the Strategic Response to Opportunities and Threats from Disruptive Technology*, 2014
- SCOR Americas Regional Partners *Navigating the Emergent Risk Landscape: Scalable Data Analytics*, 2014
- Director's Roundtable, A Dialogue with Nobel Laureate Harry Markowitz: Opportunities & Challenges in Applying Financial Techniques During a Crisis, (UCLA) *The Good, Bad & Ugly Redux: Risk Governance and Understanding the Implications of When, Why, and How Models Fail*, Invited Panelist 2013
- Director's Roundtable, Key Issues for Boards of Directors: Opportunities & Challenges in CyberTech (NYC) *The Computational Economics of Data Forensics, Cybersecurity and Digital Discovery: Opportunities and Threats of Cyborg Commerce for Corporate Risk Governance and Liability on the Wild Frontier*, Invited Panelist 2013
- National Association of Business Economists (NABE) Annual Conference 2012, Bridging the Gap Between Finance and the Real Economy, *Computational Economics and Big Data: How Technology is Transforming Business Decision Making*, Invited Panelist/Presenter 2012
- The Department of Treasury Office of Financial Research (OFR) & Financial Stability Oversight Council (FSOC) Conference *The Macroprudential Toolkit: Measurement and Analysis, Risk Management: What's the Frontier?, Forging Best Practices in Risk Management*, Invited Panelist/Presenter 2011
- National Academy of Sciences: Summit for Managing Extreme Events, Invited Panelist 2011
- Fidelity Center for Applied Technology/Santa Fe Institute Business Network Symposium, *Software Complexity: Implications for the Capability, Integrity, and Security of Large-Scale Software Systems, Implications for the Financial Industry*, Invited Presenter 2011
- Society of Casualty Actuaries Conference, *Harnessing Large Datasets to Navigate the Emerging Risk Landscape*, Invited Panelist 2011
- HB (formerly Mealey's) 18th Annual Insurance Insolvency & Reinsurance Roundtable, *Economic and Business Implications of a Changing Business Environment*, Keynote Panelist 2011

## INVITED PRESENTATIONS/PLENARY ADDRESSES (CONT'D)

- Federal Reserve Day Ahead Conference on Financial Markets and Institutions, Discussion of *Stock or Options: Risk Choices and Compensation Design*, Invited Discussant 2011
- The Reactions Conference: Risk and Capital Management in the North American Insurance Industry, *The Longevity Problem and Long-Tailed Risk Mitigation*, Invited Presenter 2010
- HB 17<sup>th</sup> Annual Insurance Insolvency & Reinsurance Roundtable, *Litigation and Regulatory Implications of Environmental, Economic, Life, Health and Casualty Exposures*, Session Chair/Panelist 2010
- HB 16<sup>th</sup> Annual Insurance Insolvency & Reinsurance Roundtable, Regulatory Modernization: *Understanding the Economics of Systemic Risk Underlying Insurance Surplus and Reserves*, Invited Panelist 2009
- Food Security Stakeholder Discussion Session (hosted by Pew Charitable Trusts and sponsored by United Health Foundation, MIT Collaborative Initiatives and Earth Institute at Columbia University Urban Design Lab), *Refocusing the Food System*, Invited Participant 2010
- Santa Fe Institute Systemic Risk Initiative Symposium, *Information Cascades and Statistical Implications of Networks with Bayesian Agents*, Joint Presentation (with Nicholas G. Polson), Invited Presenter 2009
- World Economic Forum, London, *Managing Population Demographic Risks*, Invited Presenter 2008
- ISDA Annual General Meeting, *Emergent Longevity/Mortality Derivatives*, Invited Presenter 2008
- Deloitte Global Financial Services Conference, *Managing Population Demographic Risks*, Invited Presenter 2008
- Oliver Wyman Institute London, *Emergent Longevity/Mortality Derivatives*, Invited Presenter 2008
- Federal Reserve Bank of Atlanta Financial Markets Conference, *Credit Derivatives: Where's the Risk, The Good, The Bad and The Ugly: Liquidity Risk in the \$27 Trillion Credit Derivatives Market*, Invited Presenter 2007
- Federal Reserve Bank of Richmond Credit Markets Symposium, *The Good, The Bad and The Ugly: Liquidity Risk in the \$27 Trillion Credit Derivatives Market*, Invited Presenter 2007
- Federal Reserve Bank of Atlanta, Modern Financial Institutions, Financial Markets, and Systemic Risk Symposium, *Discussion of Carry Trades and Speculative Dynamics*, Discussant 2006
- Wharton Club of New York, *Reinsurance and Hedge Funds*, Session Chair 2006
- Wharton Investment Management Conference *Fixed Income Investments*, Invited Panelist 2005
- Federal Reserve Bank of New York/Princeton, *Liquidity Risk Conference*, Practitioner Discussant 2005
- Commodity Futures Trading Commission Roundtable on Hedge Funds and Commodity Pool Operators, Invited Presenter 2005
- IRC Conference Hedge 2005 *When Volatility Shocks Occur and Bad Things Happen to Good Managers: Risk-Based Leverage, Market Liquidity and the Funding Gap*, Invited Presenter 2005
- Day Robinson *Structured Commodity/Trade Credit Conference*, Practitioner Panel 2005
- Euromoney Structured Trade and Export Finance in the Americas, Invited Presenter 2005
- 100WHF 4<sup>th</sup> Annual Risk Management Panel *When Shocks Occur: Risks, Threats and Opportunities for Hedge Funds Related to the Current and Future State of Global Financial Markets and Institutions* Chair
- GAIM 2005 Research Paper of the Year *When Bad Things Happen to Good Managers: Risk-Based Leverage, Volatility and the Limits of Arbitrage*, Keynote Address 2005
- GAIM 2004 *The Changing Role of Structured Credit in the ALM of Financial Intermediaries*, Invited 2004
- GAIM 2003/IAFE Investor Risk Committee Panel on *Hedge Fund Risk Transparency and Valuation*
- GAIM 2003 *An Examination of the Linkages Between Hedge Funds and Insurers*, Invited Presenter 2003
- IAFE Investor Risk Committee Panel *Hedge Funds at the Crossroads*, Invited Panelist 2003
- Euromoney ALM Conference 2003 *ALM and Credit Risk Intermediation*, Invited Presenter 2003
- GAIM 2002 *The Role of Credit Derivatives in Alternative Investment Strategies and Advanced Structured Credit Products Seminar*, Invited Faculty 2002

## INVITED PRESENTATIONS/PLENARY ADDRESSES (CONT'D)

- IAFE Investor Risk Committee *A Proposed Methodology for Factor-Based, Strategy-Specific Aggregate Risk Measurement for Highly Leveraged Institutions*, Invited Presenter 2002
- IAFE/IQPC Investor Risk Committee *Transparency and Disclosure for Hedge Funds and Funds-of-Funds*, Invited Panelist 2002
- IAFE/RISKinvest Investor Risk Committee, Invited Panelist 2002
- IAFE Investor Risk Committee Industry/Regulatory Panel *Hedge Funds at the Crossroads*, Invited Panelist 2002
- ICBI Risk Management and Derivatives Conference, Invited Panelist/Presenter 2002, 2003
- IQPC Hedge Funds for Pension Funds ALM 2002 *The Role of Dynamic Trading Strategies and State-Dependent Nonlinear Payoffs in Pension Liability Management*
- IMN/Fabozzi 2<sup>nd</sup> Annual Forum on Credit Derivatives and Synthetic Securitization, *Overview of the Credit Default Swap Market*, Invited Panelist 2002
- RISK ALM 2002 *The Role of Hedge Funds in ALM for Pensions and Insurers*, Invited Presenter 2002
- RISK Europe 2002 *Estimating Risk-Based Leverage and the Skewness and Kurtosis of Statistically Uncorrelated Returns*, Invited Panelist/Presenter 2002
- RISK Asset Liability Management Conference 2002 *The Role of Dynamic Strategies in ALM for Pensions and Insurers*, Invited Presenter 2002
- RISK ALM 2001 *Aggregating and Modeling Imbedded Optionality in the Balance Sheet*, Invited Presenter 2001
- IQPC Hedge Funds for Pension Funds ALM 2001 *ALM Considerations in Allocating to Alternative Investment Strategies*, Invited Presentation 2001
- IIR Risk Management Forum 2001, *Customizing Structured Products to Meet Investors' Risk Profiles: Using Swaps and Options to Target Specified Risk/Return Profiles for an Underlying Basket of Hedge Funds*
- Managed Funds Association Forum 2001 *How to Structure Tax-Efficient Hedge Fund Products*
- RISK Europe 2001 *Performance Measurement, Portfolio Insurance and Portable Alpha: Excess Return or Unpriced Risk*, Invited Panelist/Presenter 2001
- RISK USA 2001 *Risk-Based Leverage Factors Underlying Hedge Fund Linked Securities*
- RISK Asset Liability Management Conference 2001 *Aggregating and Modeling Imbedded Optionality in the Balance Sheet*, Invited Presenter 2001
- OpRISK 2001 *Coordination Failures: Sources of Operational Risk in Financial Intermediation*, Invited Presenter
- Credit RISK Summit 2000 *Assessing the Counterparty Credit Exposures of Banks and Securities Firms to Highly Leveraged Institutions*, Invited Presenter 2000
- RISK Europe 2000 *Identifying Embedded Optionality in Structured Notes and Hedge Fund Financing*
- RISK USA 2000 *Principal Components Analysis of Risk Factors Underlying Dynamic Trading Strategies*
- Credit RISK Summit 1999 *The Risks of Structured Credit Products and Collateralized Investment Obligations Linked to Alternative Asset Classes*, Invited Presenter 1999
- Energy & Power Risk Management 1998 *Hedging with Weather and Insurance Derivatives*, Invited 1998
- RISK Catastrophe Risk Securities 1998 *Assessing Model Risk Underlying Catastrophe Risk Securities*
- IFR Credit Derivatives Conference, 1998
- Strategic Research Institute (SRI) Structured Finance Industry Conferences, 1997-2003
- IMN/Fabozzi Structured Finance Industry Conferences, 1997-2003

## **Industry Seminars**

- InsurTech Alliance (ITA) Quarterly Industry Technology Consortium Technical Presentations 2019-2020
- Practising Law Institute *Emergent Longevity/Mortality Derivatives*, 2007, 2008
- FinTuition Seminar *Structured Credit Relative-Value Strategies*, 2004
- Financial Research Associates Technical Conference *Hard-to-Value Assets*, 2004
- Financial Research Associates Technical Conference *Hedge Fund Analytics*, 2001-2004
- International Center for Financial Asset Management and Engineering (FAME), 2002
- GAIM Technical Seminar Advanced Topics in Structured Products, 2001-2002

## **APPENDIX I - POST-GRADUATE EDUCATION**

### **Primary Ph.D. Concentrations**

#### Industrial Organization/Applied Game Theory

- Industrial Organization
- Economics of Financial Regulation
- Advanced Industrial Organization
- Economics of Information and Uncertainty

#### Econometrics/Mathematical Statistics

- Probability and Bayesian Statistics
- Bayesian Statistical Inference
- Econometric Theory and Methods
- Multivariate Econometric Analysis

#### Bayesian Decision Theory

- Bayesian Computational Methods

### **Secondary Ph.D. Concentrations/Coordinated Course Sequences**

- Asset Pricing, Continuous Time Finance, Option Theory, Financial Intermediation and Regulation, and Corporate Finance
- Behavioral Decision Theory/Decision Analysis
- Experimental/Behavioral Game Theory
- Theory and Empirical Analysis of Economic Social Networks

## APPENDIX II – SELECTED TECHNICAL/FINANCIAL ENGINEERING ASSIGNMENTS

**Numerati® Partners:** Industry-commissioned proprietary research (2018-2020), including over (a) 104 technical peer reviews and (b) 14 in-depth technical evaluations/assessments of functionality, reliability, and security, as well as red team testing and edge-case analysis, across the following use-case application domains: automotive telematics; computer vision (e.g., range imaging, RGB-D, *optical character recognition* (OCR), object detection, optical defect detection); virtual/augmented reality; wearable technology; remote-sensing/satellite imaging; geo-fencing; mobile fleet, commercial (e.g. fault detection) and residential *internet-of-things* (IoT) sensor networks (e.g., electricity, fire, water intrusion monitoring); IoT cybersecurity; anomaly/outlier analytics (e.g., fraud detection); data warehousing, search/information retrieval; *natural language processing* (NLP)/text recognition; distributed ledger/blockchain technology; workflow *robotic process automation* (RPA)

**Compass Lexecon:** Technical advisor to a valuation team conducting independent analysis of the \$15 Billion notional Lehman EMTN structured notes portfolio on behalf of the creditor committee; Technical oversight of bank stress-testing methodology during regulatory investigation of US subsidiary of SIFI-designated EU-based global bank; Technical advisor in international arbitration involving Benelux bancassurance conglomerate. Other technical oversight/advisory and subject matter assignments include: contingent equity forwards; leveraged credit-linked auction-rate securities structure; ABX-index CDOs; Dark pool liquidity; Asset-backed commercial paper (ABCP) residential mortgage backed securities (RMBS) warehouse facility; ethanol refining spread; american depository receipts (ADRs)

**Swiss Re:** Development of market-consistent, dynamic economic frameworks (benchmarks, indices, metrics, best practice) for relative-valuation of surplus and reserves corresponding to environmental and geo-political risks, demographics and market volatility regime changes; longevity/mortality, population aging, and medical consumption models of underlying long-dated, contingent liabilities related to life, health, and pension exposures

**S3 Asset Funding:** Development and implementation of term financing vehicle for convertible bond and equity securities inventory of hedge funds

**Risk Economics®:** Technical oversight of systematic empirical analysis conducted in connection with SB-217 pattern and practice investigation conducted by Colorado Attorney General of Aurora Police and Fire Rescue. Technical oversight of forensic financial analysis of complex structuring and intercreditor financing arrangements for an insurance industry regulatory investigation of a Ponzi scheme involving a Cayman Islands reinsurer and a hedge fund; Contingent liability analysis of LNG volumetric prepaid forwards; Subject matter expert assignment regarding rating agency securitization policies and practices; Evaluated the feasibility of two HUD agency sponsored municipal mortgage collateralized debt obligations (CDOs)

**Clinton Group:** Managed the structuring and placement of liabilities of \$2.5 billion of investment-grade synthetic and funded asset-backed CDOs, as well as the development of two scalable derivative product investment and financing facilities

**AIG:** Evaluated M&A, structured private equity and structured credit proposals; managed the quantitative analytical team and structuring process for diverse structured transactions related to medium term note structures linked to commodity indices and hedge fund returns, commercial mortgage-backed interest-only financings, and asset-backed commercial paper financing conduits; managed the valuation of Algorithmics based upon technical review of the company's valuation, risk modeling, and asset-liability management technology

**Fitch:** Led structural development and document review, model audit/validation, hazard function/damage model assessment, and statistical/econometric analysis for insurance-linked securities/insurance and weather derivatives, esoteric commercial asset-backed securities (synthetic leases, operating company securitizations, etc.), structured credit derivatives and structured equity-, credit-, commodity-, mortgage/interest rate- and hedge fund- linked notes, multi-issuer medium-term note vehicles; comparative analysis of reduced-form versus structural credit models; rating transition/credit migration models; refinement of cash-flow volatility based default estimation model

## **APPENDIX II – SELECTED TECHNICAL/FINANCIAL ENGINEERING ASSIGNMENTS (CONT'D)**

**McDonald's Corporation USA:** Co-developed a proprietary statistical benchmarking model for forecasting the performance of 900 McDonald's/WalMart joint-venture locations. The development of the model was commissioned by the Chief Operating Officer of McDonald's USA

**Credit Suisse First Boston:** Developed the Structured Multi-tranche Enhanced Loan Term Securitization (SMELTS) first emerging market corporate collateralized loan obligation; conducted econometric analysis of high yield bond yields; researched structured finance applications of credit derivatives

**Bank of Montreal/Harris Bank:** Conducted extensive statistical analysis of risk-based performance for proprietary trend-following currency trading program and optimization of position management overlay

**NYU Salomon Center:** Research for “Financial System Design for Formerly Planned Economies”

**WestLB:** Operational risk/liability analysis and cashflow modeling for non-recourse highly leveraged transactions (HLTs)

**Den Norske Creditbank:** Operational risk/liability analysis and cashflow modeling for non-recourse project financings

**Emanuel & Company:** Caribbean cross-border debt/equity swap, LBO/leveraged recapitalization, leveraged lease

## **APPENDIX III – RELEVANT TOPICS REVIEWED AS EDITOR OF JOURNAL OF RISK FINANCE**

- Stochastic Default Rate Models and Factor-Based Contingent Claims Analysis of Risky Debt
- Computing Risk Aversion Parameters and the Optimal Hedge Ratio/Capital Reserve Policy for Corporations Based upon Cash Flow Volatility
- Risk Capital Allocation for Pension Funds as a Function of Correlation Estimates, Risk Aversion, and Tail Probabilities
- Testing the Impact of Leverage and Volatility on Terminal Wealth for Index Investment Strategies
- Computing Risk-Adjusted Return on Capital (RAROC) for Property-Casualty Insurers
- Relative Risk-Adjusted Value Analysis for Catastrophic Risk Instruments
- Commercial Paper Default Estimation and Credit Rating Transitions
- Reduced Form Interest Rate Models
- Valuation of Dual-Triggered Contingent Contracts Based Upon Reservation Pricing of Residual Variance
- Role of Weather Derivatives as Power Market Hedging Contracts
- Applications of Extreme Value Theory to Risk Management Employing Hill (1975) Estimation
- Generalized Pareto Distribution Approximations of Operational Risk
- Factor Estimation of Conditional Credit Exposure
- Insurance Hedges Based Upon Linear Combinations of Reinsurance Indemnity and Index Contracts
- Estimating Portfolio Basis Risk of Insurance Industry Loss Warranty Contracts
- Comparative Analysis of Actuarial versus Financing Pricing of Insurance
- Value at Risk (VaR) Estimation
- Quadratic Approximations for Calculating VaR
- Liquidity Risk Estimation Applied to Risk-Based Capital Allocation
- Extreme Price Variation Method of Computing Risk-Based Capital
- Asset Allocation Applications of Variance Gamma Processes
- Leveraged Dynamic Hedging Policies
- Estimating Failure/Ruin Probabilities for Financial Institutions

## **APPENDIX III – RELEVANT TOPICS REVIEWED AS EDITOR OF JOURNAL OF RISK FINANCE**

- Applications of Multinomial Distribution Functions and Probit Regression to Factor Models of Correlated Credit Risks
- Applying Conditional VaR to Pension Fund Asset-Liability Management
- Design and Pricing of Equity-Linked Life Insurance Under Stochastic Interest Rates
- Utility of Wealth and Coherent Risk Measures for Risk-Based Capital Allocation
- Static Hedging of Installment Premium Options
- Monte Carlo Simulation of Incremental VaR Properties
- Market Valuation of Insurance Contracts with Profit Sharing Features
- Pricing Insurance-Linked Securities Under Interest Rate Uncertainty
- Assessment of Liquidity Risk in the Pricing of Swaps with Default Risk
- Dimension Reduction in Computing VaR and Incremental VaR
- Simulation of Static versus Dynamic Hedging of Exotic Options
- Decision and Game Theoretic Techniques for Modeling Terrorism Risk
- Multivariate and Semivariance approaches to VaR
- Constant Elasticity of Variance and Variance Gamma Models for Barrier Option Valuation
- Seasonal Single-Factor Stochastic Weather Derivative Models
- Simulated Prepayment Bounds for Match Funding Prepayable Assets with Callable Liabilities
- Merton Model Parametric Credit Risk Disaggregation
- Properties of Stochastic Volatility Processes
- Employing L- Estimators to Calculate Quantile Based Risk Measures
- Extreme Value Theory Approaches to Fat Tails, Scaling, and Stable Laws
- Copula Approach to Valuing Options Exposed to Counterparty Default Risk
- Quantile-Fitting Approach to VaR for Options

## **APPENDIX IV – HIGHLIGHTS OF PROFESSIONAL EXPERIENCE: 1983-2008**

▪ From 1983 through 1990, I was engaged in credit analysis across a wide range of industries including financial institutions. During 1991 through 1993, I served as a consultant to Mutual Benefit Life on various financial matters, to Bank of Montreal/Harris Bank on the statistical analysis of its currency trading models, and also participated in research on the structure of the Eastern European banking system being conducted by the Salomon Center at NYU Stern Graduate School of Business. During 1995, as a consultant with Credit Suisse First Boston (CSFB), developed structured products in collaboration with professionals at Credit Suisse Financial Products.

▪ From April 1997 through September 1998, as a Director within the Commercial Asset-Backed Group at Fitch IBCA, Inc. ("Fitch"), I was responsible for rating \$50 Billion of structured note programs, linked to diverse reference portfolios and indices, including municipal bonds and hedge funds, as well as asset repackaging transactions which included benefit responsive wraps. While at Fitch, in addition to leading the structured notes rating program, I also led the insurance derivatives, insurance-linked securities, and catastrophe bond rating programs, as well as any insurance structures within esoteric asset-backed securities.

▪ From October 1998 through July 2001, as Vice President of Financial Engineering/Principal Finance for American International Group, Inc. ("AIG"), I was engaged in a wide range of structured insurance transactions, including structured finite insurance and financial reinsurance to provide collateral enhancement to support ratings of both Medium-Term Note ("MTN") programs and Structured Investment Vehicles ("SIVs"). I worked on diverse corporate assignments with senior management, including the pre-acquisition analysis of specialty insurer Hartford Steam Boiler, and the preliminary valuation of American General that led to its subsequent acquisition for \$26 Billion, as well as participating in the \$1 Billion private equity investment in General Atlantic Partners.



## **APPENDIX IV – HIGHLIGHTS OF PROFESSIONAL EXPERIENCE: 1983-2008 (CONT'D)**

- While at AIG, I was recruited to join the Clinton Group, a large fixed income arbitrage and multi-strategy hedge fund management firm, as Managing Director for Structured Products. During my tenure at Clinton Group which lasted until my departure in April 2003, I was responsible for \$5 Billion of CDO assets under management, and I evaluated diverse ABS, CMBS, CDO and SIV liabilities as collateral for Clinton Group managed CDOs. Development of SIV liabilities SIV structures. Subsequent to Clinton Group, developed term financing facilities for hedge fund investment portfolios employing similar models as those capital models employed for rating and managing SIVs and derivative product companies.

- Subsequent to my tenure at Clinton Group, I advised on development of hedge fund financing facilities, and served at Swiss Re, first from February through August 2007 as Senior Advisor to Roger W. Ferguson (the former Vice Chairman of the Federal Reserve), Head of Financial Services, until his April 2008 departure from Swiss Re to become the CEO of TIAA-CREF, and then from September 2007 through December 2008, as Managing Director of Relative-Value Market Strategies, reporting to the Swiss Re Executive Committee on development of comprehensive, enterprise-wide and market-consistent valuation frameworks and strategies related to hedging demographic, socioeconomic, and longevity/mortality exposure, as well as environmental and geo-political risks, underlying the life, health, casualty, and pension liabilities. I was technical advisor/subject matter expert for the formation of the Life and Longevity Markets Association (LLMA), loss index vendor PERILS AG and risk retention group Terra Firma.

- I have been an active member of the International Association of Financial Engineers (IAFE) Advisory Board. I was also the founding Co-Chair of the IAFE Liquidity Risk Committee and a member of the Steering Committee of the IAFE Investor Risk Working Group. I have been a participant in the Institutional Investment Management Committee of the NYMEX, the National Bureau for Economic Research, and the Wharton Financial Institutions Center Working Group, where I was involved in discussions regarding the role of timely and robust funding and operating procedures for highly leveraged institutions and leveraged investment vehicles. In a similar capacity, I have chaired and participated in conferences organized by the Federal Reserve banks of New York, Atlanta, and Richmond, on liquidity and systemic risk.

- I have also been a guest lecturer on these topics at Columbia University, New York University (Courant Institute of Mathematical Sciences), as well as speaker at the CFTC Commodity Pool Roundtable about hedge fund related market risks and at the Shadow Regulatory Committee on systemic risk implications related to hedge funds, OTC derivatives, structured products, and structured investment vehicles. I also contributed to the development of hedge fund valuation guidelines by the Standing Committee-5 of the International Organization of Securities Commissions (IOSCO), and participated in high-level discussions on systemic risk within financial markets at the invitation of the National Academy of Sciences and the World Economic Forum, as well as on systemic risk and National Security at the invitation of the Office of the Directorate of National Security.

- Furthermore, as the founding Editor-in-Chief of *The Journal of Risk Finance* (a quarterly peer-reviewed periodical which addresses topics in financial risk intermediation), and as a senior member of this journal's advisory board, as well as a member of the editorial advisory board for the *Journal of Alternative Investments*, I reviewed articles on risk management, derivatives and structured products.

## **APPENDIX V – ACADEMIC ACTIVITIES**

### **ACADEMIC RESEARCH INTERESTS**

Statistical interpretability of machine testimony and machine behavior; Statistical and forensic analysis of scientific evidence; Forensic economic and statistical analysis of fault detection/diagnostics applied to representation, warranty, indemnity and product liability; Economic analysis of data and algorithmic bias, collusion and predation liability risk; Artificial Intelligence/Machine Learning validation testing and verifiability analysis; Digital/signal forensics, technology and software liability; Operational risk and cyberphysical risk liability; Reliability engineering for cyber security and safety risk of industrial controls and distributed autonomous systems.

Law and economics of financial institutions and markets; Computational economics, market externalities, and the economics of systemic risk; Supply-Chain disruption, contingent business interruption and political risk/trade credit disputes; M&A/reorganization, successor liability and fraudulent conveyance in the context of the contingent liabilities and Workouts, Bankruptcy and Financial Distress; Risk-shifting and principal-agent problems in financial markets/firms and in technology adoption; Legal, regulatory, and policy implications for forensic valuation of complex contingent instruments; Common pool resources and natural resource economics; Population and consumption dynamics and application of spatio-temporal mapping and modeling to risk analysis and monitoring/surveillance; Empirical analysis of evolving demographics, consumption dynamics, and socioeconomic conditions for geo-political risks; Population demographics and valuation of contingent liabilities in financial markets; Environmental finance; Economics of epidemiology and environmental toxicology.

### **ACADEMIC TEACHING EXPERIENCE/INTERESTS**

General teaching interests include: statistical signal processing and process control applied to remote and compressed sensing, anomaly detection, forensic analytics; governance, legal, regulatory, and economic policy implications of complex contingent instrument valuation for financial intermediaries and capital markets; applications of data analytics/machine learning to forward pricing of environmental and geo-political risks; applications of dynamic computational statistical models to socio-technical economic and geo-political systems.

#### **PhD Dissertation Committees**

- Zhu Wang *Virtual Reality for Human Balance Assessment* (May 2021)
- Sebastian Herscher *Scaling Multi-User Virtual and Augmented Reality* (January 2020)
- Connor DeFanti *Co-Located Augmented and Virtual Reality Systems* (May 2019)

#### **Academic Teaching/Advising**

- University of Chicago Booth School of Business Adjunct Professor of Econometrics & Statistics (2022- )
- NYU Center for Urban Science and Progress (CUSP) Capstone Project Team Co-Advisor: *Behavior Modeling Using Multi-Modal Mobility Data* (2022), *Developing Autonomous Drone Swarms with Multi-Agent Reinforcement Learning for Scalable Post-Disaster Damage Assessment* (2021); *Applying Multi-Agent RL to SLAM with Graph Pose for Sampled-Data MPC and CPN of Autonomous Drone Swarms* (2020)
- Faculty Independent Study Research Co-Advisor: Mayukh Ghosh, *Active Object Tracking with a Drone for Stationary Targets* (2022)
- Faculty Independent Graduate Study Research Advisor: John Y. Shin, Physics-inspired Machine Learning Algorithms and application of spectral graph theory, statistical physics, non-asymptotic random matrix theory, and computational learning theory to Graph Neural Networks (GNNs), heavy-tailed weight matrix compression and localization, as well as Jacobian matrix tail properties (Winter 2021); Mengheng Xue, Blind Source Separation (BSS) of non-intrusive electricity load monitoring (Spring 2019)
- Primary Senior Technical Oversight Advisor to RiskEcon<sup>®</sup> Lab Team Research Activities (2012- )
- NYU Tandon Cybersecurity Awareness Week (CSAW) Applied Research Competition, Judge (2012, 2017-2019)

## **Academic Teaching/Advising (Cont'd)**

- NYU Tandon CSAW HackML Competition Judge 2019
- NYU Law School Patent Litigation Simulation 3L/LLM Course, Invited Guest Expert (Fall 2016, Spring 2019)
- Co-Advisor (with Dr. A. Michael Spence): Senior honors thesis by Stern Undergraduate Do Heon Koo, *The Supercharger Effect: Comparison of Hybrid, Plug-In Hybrid, and Battery Electric Vehicle Adoption in New York State* (2017)
- NYU Center for Data Science (NYUCDS), Capstone Project Team Co-Advisor: Preliminary Exploration of Natural Language-Oriented Topical Recommendation System for Financial Research and News (2018)
- NYU Center for Data Science (NYUCDS), Adjunct Professor; Capstone Course Director, M.Sc. Data Science, 2014-2015 (See Course Syllabus: <https://cds.nyu.edu/wp-content/uploads/2014/09/syllabus-1.pdf>)
- NYU Courant Institute of Mathematical Sciences, Lecturer, Advanced Topics in Applied Math: *Dynamic Computational Statistics Models for Socioeconomic & Geopolitical Systems*, 2012
- NYU Courant Institute of Mathematical Sciences, M.Sc. Program in Financial Mathematics; Guest Lecturer 2005, 2006, 2010; Fellow, 2011-Present
- Baruch University, Valuation and Financial Engineering Course, Guest Lecturer, 2009
- Columbia University GSB, Introduction to Derivatives Markets, Guest Lecturer, 2007
- Columbia University SIPA, Guest Lecturer 2005 *Mark-to-Model versus Mark-to-Market: Liquidity, Correlation, and the Pricing of Structured CDS Trades*
- Drew University, Wall Street Semester (Undergraduate), Guest Lecturer, 2005
- University of Chicago, Graham School, Continuing/Executive Education, 1995-1996
- Nyack College ADCP, Continuing/Executive Education, 1991-1993

## **APPENDIX VI – HIGHLIGHTS OF BOARD LEADERSHIP EXPERIENCE**

I currently serve, or have previously served, on the boards of the following not-for-profit organizations: New York Academy of Sciences Board of Governors (2016-Present); Black Rock Forest Consortium Leadership Council (2013-Present); Hudson Highlands Land Trust Board of Directors (2007-2016); Scenic Hudson (2009-2015); Clearwater (2008); Hudsonia (2008).