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Atanu Saha is a Managing Director at Econ One Research, Inc. and is the head of the firm's finance and security practice. He has over 20 years of experience in the area of litigation and business consulting. He specializes in the application of economics and finance to complex business issues, with a focus on data analysis.

In the area of litigation consulting, he has provided expert testimony in numerous securities matters, involving securities fraud, market manipulation, and 10b-5 claims; he has also served as an expert witness in matters involving antitrust issues, patent disputes, valuation of investment portfolios, and commercial damages. Dr. Saha's research on securities litigation issues has been cited by the 11th Circuit Court of Appeals. In the area of data analytics, Dr. Saha has undertaken various consulting engagements involving analyses of large and complex business datasets to discern patterns and predict trends. He has considerable expertise in the pharmaceutical, energy and financial industries, having provided consulting services for various corporations and multinational businesses.

Prior to joining Econ One, Dr. Saha co-founded Data Science Partners. Previously, he was an Executive Vice President of Compass Lexecon. Additionally, he was a tenure-track professor at Texas A&M University where he taught Ph.D.-level courses in econometrics and applied economics. Dr. Saha is the author of numerous refereed journal articles, monographs and book chapters. His research has been cited in various publications, including *The Wall Street Journal*, *The Economist*, and *The New York Times*. He is the recipient of the prestigious *Graham and Dodd Award* for financial research. Dr. Saha holds a Ph.D. from the University of California, Davis, and an M.A. from the University of Alberta, Canada.

PRIOR LITIGATION CONSULTING EXPERIENCE

Antitrust and Damage Analysis

- *Arthur Garabedian v. Los Angeles SMSA et al.* — Expert report and testimony regarding pricing conditions in the cellular communications industry. The class action lawsuit involved price fixing charges against LA Cellular and AirTouch.
- *Michael A. Lobatz, M.D. v. Airtouch Cellular Company and U.S. West Cellular of California, Inc.* — Expert analysis to evaluate the joint settlement between plaintiff class and AirTouch and US West.
- *Beer Antitrust Litigation* — Expert report and testimony regarding pricing conditions in the beer industry. Econometric analysis of beer prices charged by Anheuser Busch to its distributors.
- *Industrial Ferrosilicon Antitrust Litigation* — Expert report regarding the pricing conditions in the international ferrosilicon market. The litigation involved price-fixing allegations.
- *EMC Corporation v. Mann and Karrat* — Expert report and testimony based on economic analysis to determine whether or not the memory storage products of EMC and StorageApps compete in the same product market.
- *EMC Corporation v. D.Kempel* — Expert report determining whether or not the products of EMC and SANGate Systems compete in the same product market.
- *Liebel-Flarsheim Co. v. Medrad, Inc.* — Expert report and testimony regarding “Kodak-type” issues in the fore and after markets for power injectors.

Securities Pricing and Valuation

- *County of Orange v. McGraw-Hill Companies, Inc., d/b/a Standard & Poors* — Expert witness and testimony for the defendant, Standard & Poors. Assignment included evaluation of the investment strategy implemented by Orange County in its investment pool and the estimation of damages, if any, caused by the allegedly erroneous S&P ratings of Orange County’s debt.
- *Granite Partners et al. v. DLJ and ML et al.* — Expert witness and testimony to evaluate damages suffered by the Askin Funds (Granite Partners, Granite Corporation and Quartz Hedge Funds) as a result of the liquidation of assets composed of CMOs.
- *EMC Corporation v. Joanna T. Karwowksa* — Expert Report and testimony regarding the valuation of Employee Stock Options (ESOs).
- *Amado Lopez v. Lehman Brothers et al.* — Arbitration before NASD Panel; testimony

regarding the valuation of bonds.

- *Olson v. Halvorsen et al.* — Expert witness and testimony regarding fair value of Viking Global, a hedge fund, and rebuttal damage analysis.
- *Amaranth Natural Gas Commodities Litigation* — Expert analyses and testimony regarding class certification and merits issues in natural gas futures price manipulation claim.
- *Platinum and Palladium Commodities Litigation* — Expert analysis of platinum and palladium prices in response to commodity and futures price manipulation claims.
- *IRS v. Presidio Advisory Services et al.* — Expert witness and testimony regarding ‘economic substance’ of certain investment strategies.
- *SEC v. Hedge Fund* — Expert rebuttal analysis of SEC’s allegations regarding certain trading practices of a hedge fund.
- *SEC v. optionsXpress, Inc* — Expert analysis and testimony on behalf of Charles Schwab regarding options transactions and Reg SHO issues.
- *Street Retail Inc., et al. v. Vornado Realty Trust, et al.* — Expert analysis and testimony on behalf of Vornado regarding valuation of real estate assets.
- *MKP Master Fund v. Salomon Smith Barney (SSB)* — Analysis of damages arising from the liquidation of the portfolio which occurred as a result of the margin calls faced by the hedge fund from its prime broker, SSB.
- *Eagle Cayman Fund v. Salomon Smith Barney* — Analysis of damages arising from the liquidation of the portfolio when the hedge fund failed meet the margin calls by SSB.

Securities Pricing and Securities Class Action Matters

- *Charles Fargo, et al. v. Joseph McCartney, et al.* — Expert witness and testimony for counsel for the defendant, Osicom Technologies, in a Rule 10b-5 litigation.
- *Towers Securities Litigation* — Expert analysis and testimony; event study analysis of Tower’s share prices in a Rule 10b-5 class action litigation; rebuttal damage analysis.
- *Greenfield Online Securities Litigation* — Expert analysis regarding damage exposure in a Rule 10b- 5 matter.
- *Jabil Circuits Option Backdating Inquiry* — Expert analysis on behalf of the Special Committee investigating whether the stock options granted to the executives of the firm were backdated.
- *Robert Bains, et al. v. Moores, et al.* — Expert rebuttal analysis of damages arising from the

fall of Peregrine's share prices and event study analysis of Peregrine's stock price movement.

- *WorldCom Securities Litigation* — Analysis on behalf of defendant Citi Bank; event-study analysis of the impact, if any, of securities analysts' reports on the share prices of WorldCom in a Rule 10b-5 litigation.
- *Freddie Mac Securities Litigation* — Analysis on behalf of defendant Freddie Mac; event-study analysis and estimation of potential damages exposure in a Rule 10b-5 litigation.
- *Ahold Securities Litigation* — Analysis on behalf of defendant Ahold; event-study analysis and estimation of potential damages exposure in a Rule 10b-5 litigation.
- *Global Crossing Securities Litigation* — Analysis on behalf of defendant Citi Bank; event-study analysis of the impact, if any, of securities analysts' reports on the share prices of Global Crossing in a Rule 10b-5 litigation.
- *Bank of America Securities Litigation* — Analysis on behalf of defendant Bank of America; event-study analysis of the impact, if any, of alleged corrective disclosures in a Rule 10b-5 litigation.
- *DeMarco v. Lehman Brothers* — Analysis on behalf of defendant Lehman Brothers; event-study analysis of the impact, if any, of securities analysts' reports on the share prices of RealNetworks in a Rule 10b-5 litigation. Class certification was denied by Judge Rakoff of SDNY.
- *Madoff Litigation* — Expert analysis on behalf of Securities Investor Protection Corporation (SIPC) Trustee for the liquidation of Bernie L. Madoff Investment Securities. Data analyses to examine whether Madoff's investment returns were 'too good to be true'.
- *The International Projects Development v. Oxbo Carbon & Minerals, et al.* — Expert rebuttal report and damages analysis in an ICC Arbitration matter.
- *Pokomtel S.A. v. SiCap AG* — Expert analysis and testimony in an ICC Arbitration matter.
- *SEC v. Thomas Fisher, et al.* — Expert analysis of damages resulting from alleged inflation of Nicor stock prices.

Pharmaceutical Litigation

- *Warfarin Sodium Antitrust Litigation* — Expert report regarding pricing conditions and potential consumer savings in the market for Coumadin and its generic substitute.
- *Cardizem CD Antitrust Litigation* — Expert reports and testimony regarding pricing conditions, drug substitution rates and consumer savings in the market for brand name and generic pharmaceutical drugs.

- *Lorazepam and Clorazepate Antitrust Litigation* — Expert reports and testimony regarding the economic impact of vertical supply agreements between a generic manufacturer of two pharmaceutical products and an active ingredient supplier for these products.
- *Vitamin Antitrust Litigation* — Expert analysis regarding the pricing conditions in the market for vitamin C. The litigation involved price-fixing allegations.
- *Medicis Pharmaceutical Corporation v. Actavis Mid Atlantic LLC* — Expert analysis and testimony regarding damages to brand franchise due to early generic entry.
- *Robert Bishop, et al. v. Kowa Pharmaceuticals America, Inc.* — Expert analysis regarding valuation of a privately held pharmaceutical firm.
- *Pharmaceutical Product Development, LLC v. TVM Life Science Ventures VI, L.P., et al.* — Expert analysis regarding valuation of privately held pharmaceutical firm.
- *Janssen Biotech et al. v. Celltrion and Hospira.* — Expert analysis and testimony on behalf of Pfizer regarding the entry of biosimilar substitute for the biologic drug Remicade in the U.S. market.

ERISA Litigation

- *Citi ERISA Litigation* — Analysis of behalf of Citi. Expert rebuttal report and testimony regarding class action claims.
- *Freddie Mac ERISA Litigation* — Expert analysis on behalf of defendant Freddie Mac. Comparative performance analysis of the retirement portfolio of Freddie Mac's employees. Rebuttal analysis of class action claims.
- *NUI ERISA Litigation* — Expert analysis on behalf of NUI. Rebuttal analysis of class action plaintiffs' damage claim.
- *The Southern Company ERISA Litigation* — Expert analysis on behalf of The Southern Company. Rebuttal damage analysis based on individual employee's investment decisions.
- *Bank of America ERISA Litigation* — Analysis on behalf of Bank of America. Rebuttal analysis of class action claims.

Contract Dispute

Dr. Saha has consulted in many cases involving contract disputes and failure to perform.

- Expert testimony at an arbitration on behalf of an interdealer broker regarding breach of contract and damage analyses.

- *Sinochem (USA), Inc. v. Ideal Rattan, Inc.* — Expert testimony regarding breach of contract damages.
- *Mihaylo v. Bank of America* — Economic analysis in connection with a loan dispute involving Bank of America.
- *Compton Commercial Development Renaissance Plaza Company v. East Coast Foods, Inc.* — Damages assessment regarding breach of lease contract.

REPRESENTATIVE BUSINESS CONSULTING ENGAGEMENTS

HealthCare/Pharmaceutical:

- Examination of the market dynamics and competitive landscape for various branded pharmaceutical products
- Analysis of market conditions for biologic drugs and the effect of biosimilar competition in European and Asian markets
- Impact of generic entry on brand franchise for various pharmaceutical products in the US
- Life cycle management for various branded drugs

Securities/Portfolio Analysis:

- Quantification of risk and return characteristics of a portfolio
- Analysis of mortgage backed securities and other structured debt obligations
- Valuation of exotic options, including barrier options
- Examination of deviations between market value and NAV for exchange traded funds

Trading/Market Dynamics:

- Analysis of trade execution costs
- Examination of price dynamics of commodities futures for natural gas, crude oil, precious metals
- Risk modeling

Corporate Asset Valuation:

- Valuation of public and privately-held Firms
- Analysis of stakeholder value under various financial structures and market conditions
- valuation of MBS, RMBS, and CDO portfolios held by major investment banks

General Data Analysis:

- Estimation of cigarettes purchased from NY Reservations
- Analysis of analyst report disclosure system at a major financial institution
- Analysis of financial institution client data and mutual fund share class holdings

REPRESENTATIVE CLIENTS

- Pharma/Healthcare: J&J, Kowa Pharmaceuticals, Medics, Blue Cross/Blue Shields
- Corporate: McGraw Hill, EMC Corp, Vornado, Jabil Circuits
- Financial Institutions: Citi, Bank of America, JP Morgan Chase, Schwab, Freddie Mac, American Stock Exchange
- Hedge funds: Viking Global, Amaranth, Moore Capital, MKP Capital Management

REFEREED PUBLICATIONS

“Strategic Deterrence: An Application to Biologic Pharmaceuticals,” under review.

“Has the VIX Index Been Manipulated?” with B. Malkiel and A. Rinaudo, *Journal of Asset Management*, accepted, December 2018.

“Option Writing: Using VIX to Improve Returns,” with B. Malkiel and A. Rinaudo, *The Journal of Derivatives*, Winter 2018, 38-49.

“Actively Managed versus Passive Mutual Funds: A Race of Two Portfolios,” with A. Rinaudo, *The Journal of Financial Transformation* 46, November 2017, 193-206.

“Downside Risk Protection of Retirement Assets: A New Approach,” with A. Rinaudo, *The Journal of Financial Transformation* 45, March 2017, 111-120.

“A Tale of Two Anomalies: Higher Returns of Low-Risk Stocks and Return Seasonality,” with C. Fiore, *The Financial Review* 50(2), 2015, 257-273.

“An Intraday Event Study Methodology for Determining Loss Causation,” with A. Rinaudo, *The Journal of Financial Perspectives* 2(2), July 2014, 161-172.

“Calculating Damages in ERISA Litigation,” with A. Ferrell, *The Journal of Financial Perspectives* 1(2) (2013), 93-103.

“Valuation of Cash Flows with Time-Varying Cessation Risk,” with B. Malkiel, *Journal of Business Valuation and Economic Loss Analysis*, 7(1) (2012).

“Detecting Price Artificiality and Manipulation in Futures Markets: An Application to Amaranth,” with H. Petersen, *Journal of Derivatives and Hedge Funds*, 18 (2012), 254-271.

“Forward-Casting 10b-5 Damages: A Comparison to Other Methods,” with A. Ferrell, *Journal of Corporation Law*, 37(2) (Winter 2012), 365-387.

“DCF Valuation with Cash Flow Cessation Risk,” with B. Malkiel, *Journal of Applied Finance*, 1 (2012), 175-185.

“Securities Litigation and the Housing Market,” with A. Ferrell, *Journal of Corporation Law*, Fall 2009, 92-122.

“The Clustering of Extreme Movements: Stock Prices and the Weather,” with B. Malkiel and A. Grecu, *The Journal of Investment Management* (2009), 20-35.

“The Loss Causation Requirement for Rule 10b-5 Causes-of-Action: The Implication of *Dura Pharmaceuticals v. Broudo*,” with A. Ferrell, *The Business Lawyer*, November 2007.

“Why Do Hedge Funds Stop Reporting Their Performance?” with A. Grecu and B. Malkiel, *Journal of Portfolio Management*, Fall 2007, 119-126.

“To Bundle or Not To Bundle: Firms’ Choices Under Pure Bundling,” with G. Hubbard and J. Lee, *International Journal of the Economics of Business*, February 2007, 59-83.

“Complementary Goods: Prices and Consumer Welfare Under Duopoly and Monopoly,” with A. Girnius and O. Andriychenko, *International Journal of the Economics of Business*, November 2006, 373-386.

“Generic Competition in the U.S. Pharmaceutical Industry,” with H. Grabowski, H. Birnbaum, P. Greenberg, and O. Bizan, *International Journal of the Economics of Business*, April 2006, 15-38.

“Hedge Funds: Risk and Return,” with B. Malkiel, *Financial Analysts Journal*, December 2005, 80-88. Recipient of the Graham and Dodd “*Best Perspectives Paper*” Award, 2005.

“Predicting The Price Effect of Mergers with Polynomial Logit Demand,” with P. Simon, *International Journal of the Economics of Business*, Antitrust Special Issue, 7, (2000), 149-157.

“The Economics of Crime and Punishment: An Analysis of Optimal Penalty,” with G. Poole, *Economics Letters*, 68 (2000), 191-196.

“A New Approach to Estimating Damages in Mass Torts,” with L. Hilton, *International Journal of the Economics of Business*, 7 (2000), 27-46.

“He Came, He Saw, [and] He Waited: An Empirical Analysis of Inertia in Technology Adoption,” with D. Dong, *Applied Economics*, 30 (1998), 893-905.

“Refutable Implications of the Firm Model Under Risk,” with R. Shumway, *Applied Economics*, 30 (1998), 441-448.

“Risk Preference Estimation in the Nonlinear Mean Standard Deviation Approach,” *Economic*

Inquiry, 35 (1997), 770–782.

“Estimating Nested Count Data Models,” with D. Dong, *Oxford Bulletin of Economics and Statistics*, 59 (1997), 423–430.

“Expo-Power: A Flexible Hazard Function for Duration Data Models,” with L. Hilton, *Economics Letters*, 54, July 1997, 227–233.

“Stochastic Production Function Estimation: Small Sample Properties of ML versus FGLS,” with A. Havenner and H. Talpaz, *Applied Economics*, 29 (1997), 459–469.

“Calculating Marginal Effects in Models for Zero Expenditures in Household Budgets Using a Heckman-type Correction,” with O. Capps and P. Byrne, *Applied Economics*, 4 (1997), 181–185.

“Calculating Marginal Effects in Dichotomous-Continuous Models,” with O. Capps and P. Byrne, *Applied Economics Letters*, 4 (1997), 181–185.

“The Economics and Econometrics of Damage Control,” with C. R. Shumway and A. Havenner, *American Journal of Agricultural Economics*, 79 (1997), 773–785.

“Analysis of Food Away from Home Expenditure Patterns for US Households, 1982–1989,” with P. Byrne and O. Capps, *American Journal of Agricultural Economics*, 78 (1996), 614–627.

“The Role of Information in Technology Adoption: The Case for rbST in the California Dairy Industry,” with C. Klotz and L. J. Butler, *Review of Agricultural Economics*, 17 (1995), 287–298.

“Production and Savings Under Uncertainty,” with R. Innes and R. Pope, *International Review of Economics and Finance*, 2 (1994), 365–375.

“A Two-Season Agricultural Household Model of Storage and Savings Under Uncertainty,” *Journal of Development Economics*, 45 (1994), 245–269.

“Adoption of Emerging Technologies Under Uncertainty,” with A. Love and R. Schwart, Jr., *American Journal of Agricultural Economics*, 76 (1994), 836–846.

“A Household Model of On-farm Storage Under Price Risk,” with J. Stroud, *American Journal of Agricultural Economics*, 76 (1994), 522–534.

“Joint Estimation of Risk Preference and Production Technology Using the Expo-Power Utility Function,” with R. Shumway and H. Talpaz, *American Journal of Agricultural Economics*, 76 (1994), 173–184.

“Compensated Optimal Response Under Uncertainty in Agricultural Household Models,” *Agricultural Economics*, 11 (1994), 111–123.

“Expo-Power Utility: A Flexible Form for Absolute and Relative Risk Aversion,” *American Journal of Agricultural Economics*, 75 (1993), 905–913.

MONOGRAPHS, BOOKS, AND OTHER PUBLICATIONS

“Conditional Option Writing: Using VIX to Improve Returns,” with A. Rinaudo and B. Malkiel, *Seeking Alpha*, October 26, 2018.

“Has the VIX been Manipulated? Economic Evidence Does Not Suggest So,” with A. Rinaudo, *DSP Newsletter*, June 2018.

“Should Pension Funds Divest Gun Stocks? The Answer is Not Cut and Dry,” with A. Rinaudo, *DSP Newsletter*, April/May 2018.

“Are Traditional Valuation Models Flawed? The Art–Science of Choosing the Appropriate Discount Rate,” with A. Rinaudo, *DSP Newsletter*, March 2018.

“Record Levels of Leveraged Loans and Margin Debt: Gathering Dark Clouds on the Horizon,” with A. Rinaudo, *DSP Newsletter*, February 2018.

“ERISA Litigation: Is the Inclusion of High-Fee Funds a Breach of Duty?,” with A. Rinaudo, *DSP Newsletter*, January 2018.

“Commentary: Inclusion of High-Fee Funds not Necessarily a Breach of Fiduciary Duty,” with A. Rinaudo, *Pensions & Investments*, May 14, 2018, 12.

“Are Traditional Valuation Models Flawed? An Illustrative Example: Valuing a Hedge Fund,” with B. Malkiel, *ValueWalk*, March 2018.

“Hedge Funds Today: Caveat Emptor,” with B. Malkiel, *Wall Street Journal*, July 26, 2005.

“A Game Theoretic Model of Crime and Punishment,” with G. Poole. Paper presented at the 73rd Annual Western Economic Association International Conference in Lake Tahoe, CA (July 1998).

“A New Duration Model with a Flexible Hazard Function,” with L. Hilton and A. Havenner. Paper presented at the 72nd Annual Western Economic Association International Conference in Seattle, WA (July 9–13, 1997).

“Expo-Power: A Flexible Hazard Function for Duration Data Models,” with L. Hilton. Paper presented at the American Agricultural Economic Association’s Annual Conference in Toronto, ON (1997).

“The Projected Effects of rbST and MOET on World Dairy Markets,” with L. Jarvis. Chapter in *The Potential Effect of Two New Biotechnologies on the World Dairy Industries*: Westview Press (1996).