JD Opdyke

JDOpdyke@gmail.com

EDUCATION

Massachusetts Institute of Technology, Advanced Study Program Fellow, Graduate Mathematics Department, 1999
Harvard University, Master in Public Policy, concentration: empirical methods (statistics/econometrics), 1992

- Kennedy Fellowship (3 of 170 students)
- Social Policy Research Fellowship (3 of 170 students)

Yale University, Bachelor of Arts, Sociology (Psychology minor) (with honors), 1987

SKILLS / EXPERIENCE SUMMARY

- **Building/Managing Masters/PhD-level Quant Teams**: For over 25 years, both in-house and at top consulting firms
- **Industries**: Capital Markets (Complex Derivatives/Structured Products, Sovereign Wealth Fund, Venture Capital), Insurance (Enterprise Portfolio Risk), Banking (Corporate, Retail Mortgage, Credit Card)
- **14 Peer Reviewed & Award-Winning Publications:** VaR-based capital estimation, number theory/combinatorics, robust & computational statistics, risk-adjusted market performance, statistical quality control, applied econometrics (SSRN Top 10% Authors – All-time by downloads)
- **Investment/Risk Analytics**: Operational Risk 13 capital estimation statistical projects for multiple Global/Fortune 50's, ***Journal of Operational Risk*** papers Voted **WINNER** of ORR Innovation Awards' "Paper of the Year," 2012 & 2015; Credit Risk (PD, LGD, EAD) for multiple Fortune 50 banks; Market Risk (developed widely-cited risk-adjusted performance metric); Model Risk.
- **SAS**: 30+ yrs, unrivaled expertise: multiple peer reviewed pubs of big data algos ***orders of magnitude faster than SAS Procs***
- Previous Experience with Mathematica, mathStatica, C++, C, FORTRAN, LISP, APL, Assembly Language

PROFESSIONAL EXPERIENCE

Sachs Capital Group Asset Management, LLC — 2022 – Present

Chief Analytics Officer, Senior Managing Director

Hiring senior quants optimally constructing/allocating portfolios of equities-based complex derivatives products. Derived firm's IP transforming discrete, infrequent "looks" into robust, continuous time series for forecasting & material, multi-period alpha capture.

ADIA – Abu Dhabi Investment Authority — 2020 – 2021

Quantitative Research and Development Lead, Strategy & Planning

Quant lead of the portfolio oversight function in a rapidly growing alpha factory; modeled alpha decay/structural breaks & alpha capture validation, contributed to portfolio construction & asset allocation (2 pub & 1 forthcoming paper implemented by the group)

Allstate — 2019 – 2020

Head of Enterprise Risk Analytics: Vice President, Enterprise-Level Financial Risk and Return Measurement

Reported directly to the firm's CRO; hired a risk team to develop & productionalize risk/return measurement of enterprise economic capital and quantitative scenario analytics/stress testing for the firm's portfolio, across all risk silos and business lines. Established firm's risk measurement center of excellence, implementing measurement science standards/practices for all risk areas (Insurance, Investment, Financial, Operational, Strategic). Designed & implemented multiple groups' model development & MRM policies.

GE Capital — 2013 – 2017

Managing Director, Head of Modeling: Operational Risk & Enterprise-level Capital Estimation, Aggregation & Allocation

Built and lead two teams responsible for 1) all operational risk modeling and quantification at GEC (enterprise-level RCap and ECap), CCAR (stress testing) and all related analytics and reporting (per SR11-7); and 2) enterprise-level model development for Economic Capital estimation, aggregation, and allocation across all business lines/risk types (operational, credit, market, industrial, & insurance); joint team received Dushman Award for "technical achievement with significant impact on a GE business."

DataMineit, LLC — www.DataMineit.com

Managing Director, Risk Analytics & Quantitative Investment Strategies — 2002 – 2013, 2018

Provided profitable investment and risk algorithm development to the banking, capital markets, & consulting sectors. Select clients:

- **Barclays Capital**: For the Group Operational Risk Team, researched, tested, and implemented robust statistical alternatives for more stable and reliable (heavy-tailed) severity distribution parameter estimation. Designed/implemented homogeneity analyses across nearly 100 UoMs and robustly combined internal and external loss data to statistically benchmark scenario analysis data.
- **Northern Trust**: For the Corporate Operational Risk Group, per Basel II guidelines, researched, tested, and developed robust statistical alternatives to MLE for more stable and reliable capital estimation and severity distribution parameter estimation (heavy-tailed & truncated). Gave statistical modeling presentations to inform and develop regulatory strategy; incorporated multivariate regression approaches to mitigate heterogeneity within units of measure and account for time-varying real truncation thresholds. Also developed fully data-driven (reverse) agglomeration algos (clustering/heterogeneity analyses) for unit-of-measure definition.
- **American Express**: For $1B+ liability in rewards points, a) ensured robust estimation of complex statistical measures by deriving and implementing an original, mathematically optimal algorithm for automating the re-aggregation of "thin data" segments in large-data production runs (method later published); b) recurrent events econometric modeling of points redemptions.
- **Wells Fargo**: For portfolios of 8 million mortgages and over half trillion USD, improved the estimation of creditworthiness by a) performing original econometric modeling of credit risk and delinquency behavior using proportional and non-proportional hazards, time series, count data and logistic regression models; b) increased the speed of established company SAS macros (from over a week to minutes) and created original statistical SAS Macros faster than SAS Procs, thus allowing the implementation of previously runtime-prohibitive analyses; c) analyzed complex credit class rules and quantified the impacts of proposed improvements; d) designed technical presentations and presented across multiple groups of senior management.

- **Correlation Ventures**: As the Director of Quantitative Strategies (2007-2010), developed from scratch and implemented the firm's portfolio selection investment algorithms using a proprietary dataset containing tens of thousands of exit-related financing rounds spanning 20 years. As the sole model developer, wrote over 400K lines of SAS code. Made detailed presentations of model performance to all sizeable potential investors (including 3 largest institutions (as of 4/10) prior to their commitments to invest).

- **Numerous Big 4 and Economic Consulting Firms**: On large litigations, developed econometric models (TSCS, GARCH, ARIMA, non-prop. hazards, nonlinear price elasticity); presented expert testimony in federal court arbitration ($0.4b damages).

Bates White LLC 2012 – 2013

Principal: As the sole Operational Risk Modeling Expert for the firm, brought in multiple Global 50 and Fortune 500 clients.

Bank of America, Corporate Investments Group 2010

SVP – Sr. Quantitative Finance Manager: Credit portfolio management vis-à-vis model development and application.

Andersen LLP, Economic Consulting Group

Senior Manager **1998 – 2002**

Conducted and supervised applied microeconomic, statistical, and econometric analyses in economic litigation consulting and the implementation of applied statistics / data science for diverse business consulting services. Provided key business development as one of the original senior managers building a new firm practice (1st hire into Boston office, 3rd team member nationally, fastest promotion to Sr. Mgr. directly under national partner). Growth to 30 team members upon departure 4 years later to start own firm.

ANDERSEN, LLP: TELECOMMUNICATIONS:

- Designed and implemented permutation test statistical software for a Regional Bell Operating Company (RBOC) to satisfy the Operations Support Services (OSS) performance measurement regulatory requirements of multiple states and §271 of the Telecommunications Act of 1996. Code is 5x faster than pre-compiled code from a top statistical software firm consulted on the project, and 80x faster than the implementation of a competing consulting firm
- Conducted a comprehensive statistical analysis and data audit of the retail and resale markets of an RBOC to satisfy state and federal (§271 of the Telecommunications Act of 1996) regulatory requirements
  - selected and implemented rigorous parametric and nonparametric statistical methods for parity testing on the full range of §271-related OSS performance measure data (hundreds of performance measures)
  - hired and managed a team of consultants during initial phase of data/statistical parity analysis
  - developed an original statistical algorithm for a mandated, computationally intensive statistical test (permutation test) which cut computer runtime from well over a week into hours
  - wrote a statistical affidavit detailing the appropriate implementation of permutation tests for OSS parity testing
  - performed root cause statistical analyses to determine causes of disparate service provision to CLECs
  - wrote technical appendix of a statistical affidavit filed with multiple state public service commissions
  - managed the implementation of strict quality control guidelines verifying data integrity
- For the audit of a large Bell Company, estimated cost of ISP traffic relative to CLEC local exchange revenue
- Determined and implemented a range of statistical sampling methods for an RBOC potentially facing large fines regarding its call-monitoring practices
- Employed many parametric and nonparametric statistical sampling and testing methods for two RBOCs requiring, under regulatory mandate, a performance measure sampling methodology

ANDERSEN, LLP: PRICING / RETAIL:

- Created a comprehensive firm-wide pricing tool for a multibillion dollar global professional services firm. Project manager for the data analysis component requiring identification, cleaning, and merging of disparate internal financial and client data to perform modeling for price prediction and strategy. Methods used included hedonic regression, neural nets, and the application of resampling methods to tobit models. For each model, constructed GUI interfaces that accepted project and client characteristics as input, and as output, predicted prices with user-specified confidence intervals.
- Increased profit margins for the largest privately owned retail organization in the country as project manager of the data mining component of a comprehensive product, customer, and pricing and profitability analysis. Developed and implemented a data warehouse system linking point-of-sale data (half a billion records annually) with databases across multiple systems (store, merchandise, store account, and department) to perform: a) multivariate customer segmentation utilizing various classification algorithms; b) econometric modeling of purchasing behavior; and c) sales margin, price point, geographic, competitor, departmental, and product class analyses.
- For an audit of a retail manufacturer, estimated total dollars correctly invoiced by designing and implementing nonparametric stratified bootstrap algorithms applied to ratio estimators.
- Increased profit margins for a national retail department store as the project manager for the data mining component of a comprehensive product, customer, and pricing analysis. Performed multivariate customer segmentation utilizing various classification algorithms, as well as competitor, price point, profit margin, geographic, departmental and product class analyses.

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ANDERSEN, LLP: LITIGATION / REGULATION:

- Project manager of an evaluation of statistical sampling techniques of a Department of Justice audit of a city's administration of federally funded programs; case settled favorably based mainly on analysis.
- Project manager of a $0.5 billion litigation for a Fortune 50 global retailer. Critiqued opposing expert's time-series – cross-section econometric event study and assisted counsel in numerous depositions.
- Project manager of a 65,000 individual class action lawsuit requiring extensive database construction, statistical and data analysis, and damages scenario analyses.
- Project manager of an IRS binding arbitration case. Conducted all analysis for Expert Report and Decision
- Project manager of a personal injury litigation. Critiqued opposing expert's analyses, assisted counsel in depositions.
- Performed demographic analyses in support of smoking-related tobacco class action litigation.
- Performed statistical analyses for an electric utility estimating incremental benefits of improved metering accuracy from generation to transmission, and transmission to distribution.

Charles River Associates, Inc.

Senior Associate **1993 - 1998**

Project manager of large antitrust/merger/predatory pricing litigations requiring advanced statistical and econometric analyes.

National Bureau of Economic Research

Research Analyst – Performed statistical and econometric modeling as an applied empirical researcher **1991-1992**

Harvard University, John F. Kennedy School of Government

Teaching Assistant, Advanced Econometrics; **Research Assistant**, Wiener Center for Social Policy **1991-1992**

PEER REVIEWED PUBLICATIONS SSRN Top 10% Authors—All-time by downloads

- Beating the Correlation Breakdown: Robust Inference and Flexible Scenarios and Stress Testing for Financial Portfolios, *monograph forthcoming*, ***Cambridge University Press, Elements in Quantitative Finance***, 2023.
- "Fast, Accurate, Straightforward Extreme Quantiles of Compound Loss Distributions," ***Journal of Operational Risk***, pp.1-30, 12(4), December, 2017.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness" ***Journal of Operational Risk***, pp.3-78, 9(4), December, 2014. ORR Innovation Awards **WINNER – VOTED "PAPER OF THE YEAR"** by Operational Risk & Regulation staff in consultation with industry experts.
- "Bootstraps, Permutation Tests, and Sampling Orders of Magnitude Faster Using SAS®," ***Computational Statistics: WIREs Interdisciplinary Reviews***, *Vol. 5*, Issue 5, 391-405, 2013.
- "OpRisk Capital Estimation and Planning: Exact Sensitivity Analysis and Business Decision Making Using the Influence Function," with Alex Cavallo, pp.3-73, in Operational Risk: New Frontiers Explored, Davis. E., ed., Risk Books, London, 2012.
- "Estimating Operational Risk Capital: the Challenges of Truncation, the Hazards of MLE, and the Promise of Robust Statistics," with Alex Cavallo, ***Journal of Operational Risk***, pp.3-90, 7(3), 2012. ORR Innovation Awards **WINNER – VOTED "PAPER OF THE YEAR"** by Operational Risk & Regulation staff in consultation with industry experts.
- "Permutation Tests (and Sampling Without Replacement) Orders of Magnitude Faster Using SAS®," ***InterStat***, January, 2011.
- "Much Faster Bootstraps Using SAS®," ***InterStat***, October, 2010.
- "A Unified Approach to Algorithms Generating Unrestricted and Restricted Integer Compositions and Integer Partitions," ***Journal of Mathematical Modelling and Algorithms***, *Vol. 9*, No. 1, 53-97, March, 2010. (derived formulae define multiple OEIS Sloane sequences: A017898, A078012, A017899, A013982)
- "A Powerful and Robust Nonparametric Statistic for Joint Mean-Variance Quality Control," ***InterStat***, September, 2009.
- "Comparing Sharpe Ratios: So where are the *p*-values?," ***Journal of Asset Management***, *Vol. 8*, No. 5, 308-336, Dec., 2007.
- "A Single, Powerful, Nonparametric Statistic for Continuous-data Telecommunications 'Parity Testing'," ***Journal of Modern Applied Statistical Methods***, *Vol. 4*, No. 2, 372-393, November, 2005.
- "Misuse of the 'modified' *t* Statistic in Regulatory Telecommunications," ***Telecom.Policy***, *Vol. 28*, No. 11, 821-866, 2004.
- "Fast Permutation Tests That Maximize Power Under Conventional Monte Carlo Sampling for Pairwise and Multiple Comparisons," ***Journal of Modern Applied Statistical Methods***, *Vol. 2*, No. 1, 27-49, May, 2003. Earlier draft presented at National Conference (**PharmaSUG 2002), WINNER–VOTED BEST PAPER**, Statistics and Pharmacokinetics Section.
- "The Use of Regression Techniques in Transfer Price Analysis," with R. Hartman and D. Wright, ***European Taxation***, International Bureau of Fiscal Documentation, TP, Suppl. No. 18, July, 1996.

WORKING PAPERS

- "Getting Extreme VaR Right: Eliminating Convexity and Approximation Biases from Heavy-tailed, Moderately-sized Samples" *working paper*, 2019.

JOURNAL REFEREE: ***Review Editor: Artificial Intelligence in Finance***; ***Quantitative Finance***; ***The American Statistician***; ***J. of Operational Risk***; ***J. of Applied Statistics***; ***Communications in Statistics – Simulation & Computation***; ***Telecommunications Policy***; ***Intl. Journal of Economics & Business Research***; ***Behavior Research Methods***; ***A. Matematika***

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PRESENTATIONS / CONFERENCE CHAIRS

- "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **Columbia University, Invited Guest Lecture, Machine Learning for Risk Management**, NYC, 03/20/23.
- "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **QuantStrats, 10thed, Quantitative Strategy & Innovation**, Invited Speaker & Moderator, NYC, 03/14/23.
- "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **RiskMinds Intl / RiskFuse, AI & Machine Learning Applications for Risk Management & Modeling**, 12/22.
- "The Correlation Matrix Under General Conditions: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **QuantMindsEdge: Alpha & Quant Investing**, June 6, 2022.
- "Full Probabilistic Control for Direct and Robust, Generalized and Targeted Stressing of the Correlation Matrix (Even When Eigenvalues are Empirically Challenging)" **QuantMinds International 2020**, Hamburg, Germany, November 2-6, 2020.
- "Full Probabilistic Control for Direct and Robust, Generalized and Targeted Stressing of the Correlation Matrix (Even When Eigenvalues are Empirically Challenging)" **QuantMinds/RiskMinds Americas 2020**, Boston, MA, September 22-23, 2020.
- "Getting Extreme VaR Right: Eliminating Convexity and Approximation Biases from Heavy-tailed, Moderately-sized Samples" **RiskMinds International 2019**, Invited Speaker, Amsterdam, Netherlands, December 2-6, 2019.
- "Getting Extreme VaR Right: Eliminating Convexity and Approximation Biases from Heavy-tailed, Moderately-sized Samples" **QuantMinds/RiskMinds Americas 2019**, Invited Speaker, Boston, September 9-11, 2019.
- "If not AMA, or SMA, then What? MIAMA" **RiskMinds Americas 2016**, Invited Speaker, Chicago, September 20-23, 2016.
- "The Challenges of, and Practical Solutions to, Capital Aggregation and Allocation under Heavy-Tailed, Empirical Loss Distributions," **Quant Summit USA 2016**, Invited Speaker, NYC, July 12-13, 2016.
- "Operational Risk Modeling," **OpRisk North America-2016**, Invited Speaker-Chair: Quant Studies Stream, NYC, 03/15/16.
- "Operational Risk Modeling," **GARP-17th Annual Risk Management Convention**, Invited Speaker, NYC, March 1-2, 2016.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Marcus Evans Operational Risk Management Series**, Conference Chairman and Invited Presenter, NYC, NY, September 16-17, 2015.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Operational Risk eXchange (ORX) Analytics Forum**, Invited Presenter, Milan, Italy, May 21-22, 2015.
- "Extreme Losses & Operational Risk Capital: Myths & Realities," **OpRisk NA**, Invited Presenter & Moderator, NYC, 3/24/15.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Risk Week – Yale**, Invited Presenter, Yale University, New Haven, CT, December 9-12, 2014.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, & Robustness," **JSM 2014**, Boston, MA, 8/5/14.
- "From Loss Data to Capital: Implementing a Comprehensive Operational Risk Capital Estimation Framework Under the AMA-LDA," **OpRisk North America-2014**, Invited Workshop Leader, 4-session, 6 hour Workshop, NYC, March, 2014.
- "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness – OR – How to Prevent Jensen's Inequality from Inflating your OpRisk Capital Estimates," **Globally Attended Webinar**, Boston, MA, February 11, 2013.
- "Better Capital Planning via Exact Sensitivity Analysis Using the Influence Function," **American Bankers Association: ABA Operational Risk Modeling Meeting**, Invited Presenter, Washington, DC, July 18-20, 2012.
- "Robust Statistics vs. MLE for OpRisk Severity Distribution Parameter Estimation (with and without truncation)" **Operational Risk eXchange (ORX) Analytics Modeling Forum**, Invited Presenter, San Francisco, California, September 27-29, 2011.
- "Robust Statistics vs. MLE for OpRisk Severity Distribution Parameter Estimation," **American Bankers Association: ABA Operational Risk Modeling Meeting**, Invited Presenter, Charlotte, North Carolina, August 10-12, 2011. Discussant: Bakhodir A. Ergashev, Ph.D., Lead Financial Economist, Federal Reserve Bank of Richmond.
- "Bootstraps, Permutation Tests, and Sampling With and Without Replacement Orders of Magnitude Faster Using SAS®," **JSM 2011 – Joint Statistical Meetings**, Miami, Florida, July 30-August 4, 2011.
- "Easily Implemented Hypothesis Tests for Sharpe Ratios," **Joint Statistical Meetings**, Seattle, WA, August 6-10, 2006.
- "A Nonparametric Statistic for Joint Mean-Variance Quality Control," **Joint Statistical Meetings**, Minneapolis, 8/8/2005.
- "Misuse of the 'modified' *t* statistic in Regulatory Telecommunications," **Joint Statistical Meetings**, San Francisco, 8/3/03.
- "Fast Two-Sample Permutation Tests, Especially for Multiple Comparisons and Even When One Sample is Large, That Efficiently Maximize Power Under Conventional Monte Carlo Sampling and Allow for Simultaneous Permutation-Style P-value Adjustments," **MCP 2002 – The 3rd International Conference on Multiple Comparisons**, Bethesda, MD, 8/5-7, 2002.
- "Fast Two-Sample Permutation Tests, Even When One Sample is Large, That Efficiently Maximize Power Under Crude Monte Carlo Sampling," **PharmaSUG 2002**, May 5-8, 2002, **WINNER–VOTED BEST PAPER**, Statistics and Pharmacokinetics.

PATENTS

- **Fast Two-Sample Permutation Tests**, Patent pending-US2003/0065477 A1, Filing Date: Aug. 30, 2001
  A statistical program for performing fast, multiple two-sample permutation tests, even when one of the samples is large.

PROFESSIONAL ASSOCIATIONS: ● Amer. Statistical Assoc. ● The Econometric Society ● Amer. Finance Assoc.

OTHER AWARDS / SCORES: ● GRE Quant: 800 ● LSAT: 99th Percentile ● Harvard Book Award ● Natl Merit Finalist

JD Opdyke, Senior Investment & Risk Analytics Executive

JD Opdyke is Chief Analytics Officer, Senior Managing Director at Sachs Capital Group Asset Management, LLC, where he is hiring a team of senior quants optimally constructing and allocating portfolios of equities-based complex derivatives products; he also derived the firm's IP for transforming discrete, infrequent "looks" into robust, continuous time series for forecasting and material, multi-period alpha capture. He comes to SCG from the Abu Dhabi Investment Authority where he was Quantitative Research and Development Lead of portfolio oversight, and previously from Allstate and GE Capital where he was, respectively, Head of Enterprise Risk Analytics and Head of Modeling for Operational Risk and Enterprise-level Economic Capital. JD has over 30 years of experience as an investment and risk analytics consultant, most of this in the banking and credit sectors where his Credit Risk and Operational Risk clients have included multiple Fortune and Global 50 banks. JD also is published in market risk (he developed a widely cited risk-adjusted performance metric placing him in the top 10% of all authors on SSRN), and has been invited to present his applied research as a guest lecturer at Columbia University, and at QuantStrats, QuantMindsEdge: Alpha-Investing, QuantMinds (Intl & Americas), RiskMinds (Intl & Americas), RiskFuse, GARP, Quant Summit USA, ABA OpRisk Forum, ORX Analytics Forum, OpRisk N America, Risk Week-Yale Univ., and Marcus Evans OpRisk Series as Conference Chair. JD earned his Bachelors, with honors, from Yale University, his Masters from Harvard University where he was awarded both Kennedy and Social Policy Research Fellowships, and he completed a post-graduate fellowship in MIT's graduate mathematics department.

Investment/Risk Analytics Publications (SSRN Top 10% Authors – All-time by downloads)

- Opdyke, J.D., "Comparing Sharpe Ratios: So Where are the p-values?," ***Journal of Asset Mgmt***, Vol. 8, No. 5, Dec., 2007.
- Opdyke, J.D., Beating the Correlation Breakdown: Robust Inference and Flexible Scenarios and Stress Testing for Financial Portfolios, ***Cambridge Univ. Press, Elements in Quantitative Finance***, *monograph forthcoming*, 2023.
- Opdyke, J.D., "Fast, Accurate, Straightforward Extreme Quantiles of Compound Loss Distributions," ***Journal of Operational Risk***, pp.1-30, 12(4). December, 2017.
- Opdyke, J.D., "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," ***Journal of Operational Risk***, pp.3-79, 9(4), December, 2014.
- Opdyke, J.D. and Cavallo, A, "Operational Risk Capital Estimation and Planning: Exact Sensitivity Analysis and Business Decision Making Using the Influence Function," Chapter 1 in **Operational Risk: New Frontiers Explored**, Davis. E., ed., Risk Books, London, 2012.
- Opdyke, J.D. and Cavallo, A, "Estimating Operational Risk Capital: the Challenges of Truncation, the Hazards of MLE, and the Promise of Robust Statistics," ***Journal of Operational Risk***, pp.3-90, 7(3), 2012.

Selected Related Publications

(Number Theory/Combinatorics, Big Data/Computational Statistics, Statistical Quality Control)

- Opdyke, J.D., "A Unified Approach to Algorithms Generating Unrestricted and Restricted Integer Compositions and Integer Partitions," ***Journal of Mathematical Modelling and Algorithms***, Vol. 9, No. 1, 53-97, March, 2010.
- Opdyke, J.D., "Bootstraps, Permutation Tests, and Sampling Orders of Magnitude Faster Using SAS®," ***Computational Statistics: WIREs Interdisciplinary Reviews***, Vol. 5, Issue 5, 391-405, 2013.
- Opdyke, J.D., "A Powerful and Robust Nonparametric Statistic for Joint Mean-Variance Quality Control," ***InterStat***, 2009.

Risk Analytics Awards

- **WINNER**, 2015 ORR Innovation Awards, **Voted "Paper of the Year"** by Operational Risk & Regulation staff in consultation with Industry Experts: Opdyke, J.D. "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," ***Journal of Operational Risk***, pp.3-79, 9(4), 2015.
- **WINNER**, 2012 ORR Innovation Awards, **Voted "Paper of the Year"** by Operational Risk & Regulation staff in consultation with Industry Experts: Opdyke, J.D. and Cavallo, A, "Estimating Operational Risk Capital: the Challenges of Truncation, the Hazards of MLE, and the Promise of Robust Statistics," ***Journal of Operational Risk***, pp.3-90, 7(3), 2012.

Invited Investment & Risk Analytics Research Presentations / Conference Chairs

- Opdyke, J.D., Invited Guest Lecture, "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **Columbia University, Machine Learning for Risk Management**, NYC, 03/20/23.
- Opdyke, J.D., Invited Presenter, "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **QuantStrats, 10th ed., Quantitative Strategy & Innovation**, NYC, March 14, 2023.
- Opdyke, J.D., Invited Presenter, "Beating the Correlation Breakdown: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **RiskMinds International / RiskFuse**, December 13, 2022.
- Opdyke, J.D., Invited Presenter, "The Correlation Matrix Under General Conditions: Robust Inference and Fully Flexible Scenarios and Stress Testing for Financial Portfolios," **QuantMindsEdge: Alpha & Quant Investing**, June 6, 2022.
- Opdyke, J.D., Invited Presenter, "Full Probabilistic Control for Direct and Robust, Generalized and Targeted Stressing of the Correlation Matrix" **QuantMinds International, 2020**, Hamburg, Germany, November 2-6, 2020.
- Opdyke, J.D., Invited Presenter, "Full Probabilistic Control for Direct and Robust, Generalized and Targeted Stressing of the Correlation Matrix" **QuantMinds/RiskMinds Americas, 2020**, Boston, MA, September 22-23, 2020.
- Opdyke, J.D., Invited Presenter, "Getting Extreme VaR Right: Eliminating Convexity and Approximation Biases from Heavy-tailed, Moderately-sized Samples," **RiskMinds International, 2019**, Amsterdam, Netherlands, Dec. 2-6, 2019.
- Opdyke, J.D., Invited Presenter, "Getting Extreme VaR Right: Eliminating Convexity and Approximation Biases from Heavy-tailed, Moderately-sized Samples," **QuantMinds/RiskMinds Americas, 2019**, Boston, MA, Sept. 9-11, 2019.
- Opdyke, J.D., Invited Presenter, "If not AMA, or SMA, then What? MIAMA: A Robust, Risk Sensitive, Internally Consistent OpRisk Capital Estimation and Stress Testing Framework," **RiskMinds America, 2016**, Chicago, IL, Sept. 20-23, 2016.
- Opdyke, J.D., Invited Presenter-Chairman of Quant Studies in OpRisk Stream, "Operational Risk Regulatory Capital Estimation," **OpRisk North America-2016**, NYC, NY, March 15-16, 2016.
- Opdyke, J.D., Invited Presenter, "Operational Risk Modeling," **Global Association of Risk Professionals (GARP)-17th Annual Risk Management Convention**, NYC, NY, March 1-2, 2016.
- Opdyke, J.D., Conference Chairperson and Invited Presenter, "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Marcus Evans – Operational Risk Management**, NYC, NY, September 16-17, 2015.
- Opdyke, J.D., Invited Presenter, "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Operational Risk eXchange (ORX) Analytics Forum**, Milan, Italy, May 21-22, 2015.
- Opdyke, J.D., Invited Presenter and Moderator, "Extreme Losses, EVT, and Related Models: OpRisk Regulatory Capital Under the AMA," **OpRisk North America-2015**, NYC, March, 2015.
- Opdyke, J.D., Invited Presenter, "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness," **Risk Week – Yale**, New Haven, CT, December 9-12, 2014.
- Opdyke, J.D., Invited Workshop Leader, "From Loss Data to Capital: Implementing a Comprehensive Operational Risk Capital Estimation Framework Under the AMA-LDA," **OpRisk North America-2014**, 4-session, 6 hour Workshop, NYC, March, 2014. Attendees included representatives from multiple federal regulatory agencies.
- Opdyke, J.D., Invited Presenter, "Better Capital Planning via Exact Sensitivity Analysis Using the Influence Function," **American Bankers Association: ABA Operational Risk Modeling Meeting**, Washington, DC, July 18-20, 2012.
- Opdyke, J.D., Invited Presenter, "Robust Statistics vs. MLE for OpRisk Severity Distribution Parameter Estimation (with and without truncation)" **ORX Analytics Modeling Forum**, San Francisco, California, September 27-29, 2011.
- Opdyke, J.D., Invited Presenter, "Robust Statistics vs. MLE for OpRisk Severity Distribution Parameter Estimation," **American Bankers Association: ABA Operational Risk Modeling Meeting**, Charlotte, North Carolina, August 10-12, 2011. Discussant: Bakhodir A. Ergashev, Ph.D., Lead Financial Economist, Federal Reserve Bank of Richmond.

Risk Analytics Webinar

Opdyke, J.D., "Estimating Operational Risk Capital with Greater Accuracy, Precision, and Robustness … OR … How to Prevent Jensen's Inequality from Inflating your Operational Risk Capital Estimates," February, 11, 2013. Over seven dozen registrants included 41% bankers, 29% consultants, 10% investors, 7% regulators, 6% academics, and about 3% each from insurance and risk management associations.

Selected Investment & Risk Analytics Client Projects

- For the Enterprise and Operational Risk Group, designed and implemented a comprehensive Operational Risk Capital Estimation Framework. Based on statistically rigorous methods designed to withstand regulatory review, the framework allows for i) the proper treatment of truncated distributions; ii) capturing diversification benefit by estimating dependence across units of measure; iii) statistically benchmarking scenario analysis data; iv) robustly combining internal and external loss data where appropriate; and v) utilizing multivariate KRI-to-capital regression models (frequency, severity, and both concurrently) when translating loss data into Basel II–AMA capital estimates.
- Designed and implemented a comprehensive operational risk capital estimation framework covering almost 100 units of measure. Statistical code explicitly employed data combining methodologies to use both internal and external data, thus increasing statistical power and at least partially overcoming data paucity issues; utilized a wide range of truncated severity distributions to account for data collection thresholds where appropriate; and robustly incorporated scenario analysis data into the parameter estimation process using internally consistent statistical methods. Estimates of both regulatory and economic capital were consistent with expectations and passed "reasonableness" tests.
- Researched, tested, and developed robust statistical alternatives to MLE for more stable and reliable capital estimation and (truncated) severity distribution parameter estimation.
- Designed and Implemented an original capital estimator designed to eliminate the capital overstatement bias caused by Jensen's Inequality; the estimator also dramatically increased the precision and robustness of capital estimates, ceteris paribus, making it unambiguously better than LDA-MLE-based capital estimates.
- Development, testing, comparison, and implementation of agglomeration and reverse agglomeration algorithms for the data-driven determination of units-of-measure.
- Designed and implemented homogeneity analyses and testing of external versus internal loss data.
- Incorporated multivariate regression approaches to mitigate heterogeneity within units of measure and account for time-varying real truncation thresholds. Regression methodology utilized both discrete and continuous KRIs in estimating parameters of the severity distribution(s), unarguably the largest drivers of capital.
- Conducted a comprehensive review and comparison of severity and frequency distribution estimation methodologies; data combining methodologies for combining internal and external loss data; competing methods for selecting severity distributions; and methods for incorporating scenario analysis data into severity and frequency estimation process that were internally consistent with data combining and estimation methods employed.
- Robust severity estimators tested, compared to non-robust alternatives (e.g. MLE), and implemented under constrained optimization with scenario analysis data.
- Conducted comprehensive testing / agglomeration of internal, external, and combined loss event data across dozens of units of measure.
- Extensive PD, LGD, and EAD credit risk modeling and model validation for multiple banks and multiple portfolios.
- Designed and implemented numerous copulae models for portfolio risk modeling; multivariate Poisson and Negative Binomial regression; and Scale and GAMLSS regression of severity distribution parameters identifying KRI's.

Selected Investment & Risk Analytics Client Testimonials

- "In addition to scientific rigor, the project also required creative problem solving to effectively develop statistical solutions to problems previously unsolved in the banking industry within a highly scrutinized regulatory arena. …From a pool of candidates that included a number of highly specialized economics and statistics consulting firms and senior academic statisticians and actuaries from leading universities, I selected J.D. for the project. I hired J.D. in part because of his academic background in robust statistics, but mainly because of his reputation for solving difficult, previously unsolved analytical and statistical problems in non-academic commercial settings. On the job, under tight deadlines, J.D. did not disappoint. …I would hire him again as a consultant for high stakes, complex, or large scale projects that involve creative solutions to complex mathematical or statistical problems, quantitative modeling, data management, or advanced statistical/econometric analytics."

- "JD demonstrated that he is an expert in statistical analysis techniques for operational risk modelling … I am very pleased with the outcome, and would readily employ JD for future engagements of this type."

- "J.D.'s work ethic is especially suited towards client needs. … [his] attitude allowed him to complete what others thought impossible. The infectious enthusiasm about the work helped improve morale in the office. Simply, JD provided us with a dedication that not only exceeded our highest expectations, but also exceeded what we knew was possible to expect from a consultant. In value provided to the firm, he has been worth every dollar spent."

- "J.D. was one of the very few consultants out of many that we re-signed for a second six-month term. J.D.'s SAS expertise is quite literally beyond guru-level. He has written statistical SAS code that is faster than SAS's own pre-compiled procedures (SAS Procs), and I understand he has done this routinely. He also has dramatically improved the efficiency of our own internal, time-tested and validated SAS macros, increasing speed by orders of magnitude (e.g. from over a week down to just 90 minutes). This made possible the generation of essential econometric results that otherwise simply would have been runtime prohibitive, even on a fast and powerful Unix system. J.D.'s consulting is characterized not only by the speed of his deliverables, but also by the speed of his work. He is an extremely efficient statistical programmer in both senses of the term "efficient" – his code is efficient, as described [above], and he gets the code written quickly (without ever sacrificing careful, thorough data management and validation, as well as internal logic checks). J.D. has performed a wide range of statistical analysis and econometric modeling for the group, including proportional and non-proportional hazards, logistic, count data, and time series models. This work has made significant original contributions beyond what we had in-house previously. As just one example, the econometric results generated from one of the extremely efficient SAS macros he wrote have become a centerpiece of an essential monthly tracking report. J.D. has designed and delivered PowerPoint presentations to senior management across multiple divisions of our office. The presentations were extremely well organized, well delivered, and very well received, serving as the basis for significant project scope increases. …J.D. has always been a pleasure to work with, and his work ethic, an inspiration."