

Tibor Jánosi

RISK MANAGEMENT · ECONOMIC ANALYSIS AND DECISION-MAKING · INVESTMENT MANAGEMENT · ADVANCED FINANCIAL ANALYTICS AND DATABASES · AI

Cornell University - Ithaca, NY

✉ tj13@cornell.edu

“Rational economic analysis and quantitative modeling relying on large volumes of data are the future of Finance.”

Summary of Qualifications and Areas of Responsibility

Unique combination of expertise in investment management and quantitative analysis.

DYNAMIC, FLEXIBLE, INQUISITIVE

- Responsible for risk management at Cornell University's Office of University Investments (OUI), an endowment managing approximately \$7.2 billion. Part of the senior investment team, contributing to decisions on investments, at times with a determinant role in areas of particular expertise (e.g. strategies involving government bonds, derivatives, quantitative trading strategies, the technology sector). Experienced reviewer of risk management systems at select investment managers on behalf of the OUI, including at some of the largest hedge funds in the world. Responsible for organizing, cleaning up, and organizing the OUI's historical financial databases and developing software to facilitate the development of complex models and reporting systems based on the resulting databases. Evaluated, and worked with external financial data, computation, and document management vendors, to assess their systems, establish correctness and consistency of results, and guide them through fixing the errors in their processes. Provided general internal OUI modeling support, coordination, and supervision, as well as occasional professional development lectures.
- Experience working with members of the Board of Trustees of Cornell University, particularly members of the Board's Investment Committee and its subcommittees, among whom are numerous nationally and internationally known business figures.
- Experience in working with the most senior Cornell University leadership, both in reporting and updates on OUI matters and special projects going beyond regular duties.
- Possessing a rare combination of skills covering in depth areas of theoretical and practical financial modeling, enhanced by a strong academic background.
- Extensive teaching experience at Cornell University, in areas related to theoretical, applied, and computational financial modeling, risk management, advanced programming, and other areas. Taught at three elite universities on two continents, both at graduate and undergraduate level.
- Strong research background in Finance, Computer Science, and areas of Applied Mathematics. Published peer-reviewed papers, including seminal work on credit risk. Published derivatives-modeling software as a companion to a textbook authored by one of the world's foremost experts in the field. Performed innovative research in a corporate (hedge-fund) environment, not publicly released due to NDAs.
- Joint holder of a patent on the valuation of commercial mortgage-backed securities (CMBS).
- Familiar with the workings of both buy and sell side of the financial world, including entities with net asset values in the multi-billion range. Excellent understanding of the endowment world, and the dilemmas and limitations of investing in a variety of economic environments. Thoroughly familiar with the due diligence needed to evaluate investment managers in up to the multibillion dollar range of assets under management. Capability of interacting with world-famous investment managers and debate investment decisions on their merits, without yielding or deferring to the professional, social, or financial status of the person interviewed. Possesses an understanding of the complexities of investing in an international environment.
- Experience implementing financial models for big investment firms. Proficient at developing, implementing, testing, and using complex financial models involving large databases and complex numerical computations, both in corporate and academic settings. Extensive experience evaluating such models when evaluating potential or existing investments. Insight into aspects of financial modeling and risk management as performed at some of the biggest Wall Street banks.
- Consulting experience for a variety of financial firms. Experience in working in a finance-oriented start-up environment.
- Deep expertise in overcoming data errors in commercial vendor's financial databases, and • implementing methods for maintaining the consistency of financial data sets.
- Extensive experience in implementing, debugging, and performance tuning of financial computations. Ability to design and implement systems while maximizing the correctness of generated results, and the detection of potentially subtly anomalous inputs.
- Participated in the development of large-scale software systems. Extensive background in a large variety of Computer Science areas (e.g. systems, hardware and software performance optimizations, functional/imperative/logic programming, error testing/elimination).
- Supervised projects by students of Cornell's School of Operations Research and Industrial Engineering Financial Engineering Center in Manhattan and some of Wall Street's biggest firms.
- A continued interest in Artificial Intelligence, going back to a Master's Thesis on knowledge representation and inference systems.
- Proficient to various degrees in five languages.

Research

ENDOWMENT Management, RISK Management

- Developed innovative ways to manage and validate databases of financial information within the OUI.
- Worked on financial models meant to overcome the limitations of investing in an endowment environment, such as the existence of hard-to-value, illiquid assets in a private-partnership structure, big lags and uncertainties in reported financial results by investment managers, as well as partial lack of control on the timing of investment cash flows (such as in the case of the drawdown of unfunded commitments by investment managers).
- Implemented models beyond the traditional ones pervasive in the endowment world, allowing for non-normal distribution of asset-class returns, non-linear effects (such as abrupt rebalancing when asset class holding limits are reached), an evolving correlation structure between asset class returns, and the algorithmic correction of empirical correlation matrices (which tend not to be true positive semi-definite correlation matrices when computed based on time series of non-uniform length).

Reinsurance

- Worked on modeling expected losses, valuation, and the hedging of catastrophe reinsurance portfolios. We applied our insights to a portfolio close to one billion dollars.

Residential Mortgage-Backed Securities

- Was involved in a major project related to the modeling, hedging, and (to a lesser extent) structuring of residential mortgage-backed securities, for one of the major issuers of such securities at the time of my involvement.
- The total value of the securities involved in these deals was of tens of billions of dollars (with a much smaller net exposure).

Options on Commodity Futures

- Performed the (non-trivial) gathering and analysis of historical price data for options on commodity futures. Worked on models for the evolution of such options and contributed to the design of related trading strategies.

Forward-Rate Smoothing

- Investigated the non-parametric smoothing of Treasury bond data by imposing intra-day and inter-day arbitrage considerations. This work has been developed in my Ph.D. dissertation. Research later extended to include corporate bonds.

Commercial Mortgage-Backed Securities

- Implemented and empirically validated complex models for a state-of-the-art commercial mortgage-backed securities valuation system.

Credit Risk

- Seminal research in credit risk. Published the first estimates of expected losses and liquidity discounts inferred from corporate debt pricing data. Published one of the first estimates of the same parameters inferred from equity prices.

Valuation of Non-Maturity Demand Deposits

- Published the first estimates of banks' non-maturity deposit values based on the Jarrow-van Deventer model.

Automated Trading Systems

- Investigated the hardware and software infrastructure requirements for building large-scale automated trading systems.

Other Computer Systems

- TCL-DP: a toolkit for distributed programming written as an extension to the Tool Command Language. Used in a variety of applications, including critical industrial and satellite control systems.
- Dali: Participated in the initial development phases of the first high-performance toolkit for Multimedia programming that allowed for the modular development of complex applications, e.g. MPEG decoders, previously coded only as monoliths.

Inventor

Structured finance securities option pricing architecture and process - US8788404B1

A PATENT ON THE VALUATION OF STRUCTURED-FINANCE SECURITIES, INCLUDING COMMERCIAL MORTGAGE-BACKED SECURITIES (CMBS).

Teaching

FINANCE, QUANTITATIVE FINANCE & BUSINESS

Applied Finance Research

Cornell University

- Ran a successful, technically-oriented financial internship program at the Office of University Investments, focused on providing students with an economics/science/engineering background a fast-paced introduction to advanced financial modeling and computations.

Credit Risk (ORIE 5620)

Cornell University

- Graduate-level course in quantitative credit risk.

Financial Models and Computational Issues (NBA 528)

Cornell University

- Innovative quantitative course exploring the application of advanced numerical techniques to financial problems. Taught jointly with Robert Jarrow.

Derivatives I and II (NBA673 and NBA 674)

Cornell University

Computational Tools and Methods in Finance (CS 522)

Cornell University

Business Modeling with Advanced Excel (NBA 629)

Cornell University

- Based on student feedback, one of the most appreciated courses in the business school at the time it was offered.

Advanced Spreadsheet Modeling (NBA 647)

Cornell University

Managerial Spreadsheet Modeling (NBA 643)

Cornell University

COMPUTER SCIENCE

Data structures and Functional Programming (CS 312)

Cornell University

Introduction to Theory of Computing (CS 381)

Cornell University

- A course on theoretical models of computation and the limitations of computers.

Multimedia (CS 631)

Cornell University

- Co-taught the course; covered image and video compression standards and general compression algorithms.

Numerical Analysis (CS 421) - partially

Cornell University

Multimedia (CS 631)

Cornell University

- Teaching Assistant

Structure and Interpretation of Computer Programs (CS 312)

Cornell University

- Teaching Assistant

Practicum in Advanced Object-Oriented Programming in C++

Practicum in Compilers and Interpreters.

Employment (Selected)

CONSULTING

Risk management and analytics, economic decision-making, quantitative modeling

CORNELL UNIVERSITY

Professor of the Practice (V)

SC JOHNSON COLLEGE OF BUSINESS

Senior Investment Officer, Risk and Portfolio Analytics

OFFICE OF UNIVERSITY INVESTMENTS

- Managing Director, Risk and Portfolio Analytics
- Director, Risk and Portfolio Analytics
- Consultant

Assitant Professor of Finance (V)

SC JOHNSON GRADUATE SCHOOL OF MANAGEMENT

Assistant Professor of Computer Science (V)

COLLEGE OF ENGINEERING, DEPARTMENT OF COMPUTER SCIENCE

MAGNETAR CAPITAL

Researcher, Quantitative Finance

WORKED ON SPECIAL PROJECTS WITH TOP MANAGEMENT; CMBS; REINSURANCE; COMMODITIES; STRUCTURED

PRODUCTS

- Developed investment/trading strategies (e.g. in reinsurance, futures trading).
- Extensive work on CDOs/CMBS.

Awards, Prizes, & Honors

Awards & Honors

- Past Fellow of the Federal Deposit Insurance Corporation's Center for Financial Research (2005-2006).
- Recipient of several departmental awards from the Computer Science Department at Cornell University.
- Held an 18-month honorary fellowship of the Hungarian Academy of Sciences awarded to outstanding young graduates. The fellowship financed research and study at the Technical University of Budapest, Hungary.

Prizes

- Established a national record in college by winning 12 National Prizes, including several first prizes, at National University Student Olympiads in Informatics, Mathematics, and Physics. Won two national first prizes in Computer Programming and Physics at National Student Olympiads before college. Won numerous other regional-level prizes in Physics, Informatics, and Mathematics.

Education

Ph.D. in Computer Science / Finance (2004)

Ithaca, NY

CORNELL UNIVERSITY

Master of Science in Computer Science

Ithaca, NY

CORNELL UNIVERSITY

Technical Skills

- Advanced automation of business analytics software.
- Excellent software audit capabilities.
- Developed and wrote domain-oriented programming languages. Familiar with Lex/Yacc parser generator tools. Capable of writing lexers and parsers by hand.
- Advanced capability for debugging and performance tuning, including in numerical computations. E.g., understands how microprocessor cache architecture influences program performance.
- Mathematical programming languages: Matlab, R, Octave.
- Functional programming languages, including F#, SML, Lisp, Dylan.
- A large family of imperative programming languages: C++, C#, C; Java.
- Numerous scripting languages and environments.
- Relational and non-relational databases. Excellent knowledge of SQL.