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EDUCATION

M.SC. IN MATHEMATICS

Sofia University, Bulgaria
July 1974

Thesis: "Reliability of Aging Systems"

Ph.D. IN MATHEMATICS

Lomonosov University
Moscow, USSR. Faculty of
Mechanics and Mathematics,
October 12, 1979.

Dissertation: "The structure
of the metrics in the space of
random variables and their
distributions."

DOCTOR OF SCIENCE (Habilitation) in Physics and Mathematics, Steklov

Mathematical Institute,
Moscow, USSR. April 10, 1986.

Dissertation: "Probability
metrics and their applications
to the stability problems for
stochastic models"

ABOUT

DATE OF BIRTH: September 6, 1951

CITIZENSHIP: U. S. A.

CURRENT POSITION: Professor, Department of Mathematics & Statistics,
Texas Tech University

PREVIOUS APPOINTMENTS

2017 – CURRENT

Professor, Department. of Mathematics & Statistics, Texas Tech University

2012 – 2016

Professor, College of Business Program Director, Finance and Accounting
Stony Brook University
Research Professor, Department of Applied Math and Statistics

2011 – 2012

Frey Family Foundation Chair of Quantitative Finance
Department of Applied Mathematics and Statistics
Stony Brook University

1998 – 2010

Endowed Chair of Statistics
Econometrics and Mathematical Finance
School of Economics and Business Engineering
Karlsruhe Institute of Technology

1989 – 1998

Professor, Department of Statistics and Applied Probability
University of California at Santa Barbara (1994-1995, Department Chairman)

1988 – 1988

Visiting Associate Professor
Stony Brook University

1987 – 1987

John H. Van Vleck, Visiting Professor, Wesleyan University, Connecticut
and Visiting Associate Professor, Centre for Stochastic Processes
University of North Carolina at Chapel Hill

1984 – 1986

Senior Research Fellow, Bulgarian Academy of Sciences
and Visiting Senior Research Fellow
Steklov Mathematical Institute, Academy of Sciences of the USSR, Moscow

1980 – 1984

Research Fellow, Mathematical Institute, Bulgarian Academy of Sciences

1977 – 1979

Post-graduate Student, Lomonosov University, Faculty of Mechanics and
Mathematics, Department of Probability, Moscow, USSR

1974 – 1977

Mathematician, Mathematical Institute, Bulgarian Academy of
Sciences



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AWARDS

Fellow of the Institute of Mathematical Statistics
Elected Member of the International Statistical Institute
Foreign Member of the Russian Academy of Natural Sciences
Honorary Doctor of Science at St. Petersburg Technical University
Senior Humboldt Professor Award
Barney E. Rushing, Jr., Faculty Distinguished Research Award - STEM at Texas Tech University
Excellence in Innovation Award at Texas Tech University

PUBLISHED/BROADCAST INTERVIEWS

ZARI RACHEV. FACTBOX-TOOLS TO PREDICT MARKET SHOCKS, REUTERS, MAY 24, 2009

https://www.reuters.com/article/models-math/factbox-tools-to-predict-marketshocks-idUSL169274620090525_

<https://www.reuters.com/article/us-models-finanalytica/assessing-the-risk-of-a-cataclysm-idUSTRE54O00R20090525>

RISIKOMANAGER JOURNAL: Interview with Prof. Dr. Svetlozar Rachev, Chair of Statistics, Econometrics and Mathematical Finance at University of Karlsruhe (TH) and Prof. Stefan Mittnik (Ph.D.) Chair of Financial Econometrics at University of Munich New Approaches for Portfolio Optimization Parting with the Bell Curve

https://statistik.econ.kit.edu/download/doc_secure1/RM-Interview-RachevMittnik-EnglishTranslation.pdf

PATENTS

RACHEV ET AL. SYSTEM AND METHOD FOR THE VALUATION OF DERIVATIVES,

United States Patent, Serial No. 10/888,414, Filed July 9, 2004, Docket No. 031/0424:US.UTL, PATENT NUMBER 7,630,931, DATE OF PATENT: DECEMBER 8, 2009

RACHEV ET AL. SYSTEM AND METHOD FOR PROVIDING OPTIMIZATION OF A FINANCIAL PORTFOLIO USING A

PARAMETRIC LEPTOKURTIC DISTRIBUTION, United States Patent, Serial No. 10/888,414, Filed July 9, 2004, Docket No. 031/0424:US.UTL, May, 2010

RACHEV ET AL. RISK MANAGEMENT SYSTEM AND METHOD FOR DETERMINING RISK CHARACTERISTICS EXPLAINING HEAVY TAILS OF RISK FACTORS, U.S. Patent Trademark Office, Patent No. 7,778,897, August 17, 2010

RACHEV ET AL. SYSTEM AND METHOD FOR PROVIDING REALLOCATION AND REVERSE OPTIMIZATION OF A FINANCIAL PORTFOLIO USING A PARAMETRIC LEPTOKURTIC DISTRIBUTION, United States Patent, U.S. Patent Trademark Office, Patent No. 7,890,409, February 15, 2011

RACHEV ET AL. SYSTEM AND METHOD FOR GENERATING RANDOM VECTORS FOR ESTIMATING PORTFOLIO RISK,

United States Patent, U.S. Patent Trademark Office, Patent No. 8,170,941, May 1, 2012

MENTORED PH.D. STUDENTS

1. **PRACHI CHATURVEDI** (UCSB, DEPARTMENTS OF STATISTICS AND APPLIED PROBABILITY)
2. **BESSY ATHANASOPOULOS** (UCSB, DEPARTMENTS OF STATISTICS AND APPLIED PROBABILITY)
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62. **YUAN HU** (TEXAS TECH UNIVERSITY, DEPARTMENT. OF MATHEMATICS & STATISTICS)
63. **ALI MUQADAS JAFFRI** (TEXAS TECH UNIVERSITY, DEPARTMENT OF ECONOMICS)



SVETLOZAR (ZARI) TODOROV RACHEV

LIST OF SVETLOZAR RACHEV'S POSTDOCTORAL STUDENTS

1. **Dr. Young Shin Kim** (Karlsruhe Institute of Technology, School of Business and Economics)
2. **Dr. Jiho Park** (Texas Tech University, Department. of Mathematics & Statistics)
3. **Dr. Davide Lauria** (Texas Tech University, Department. of Mathematics & Statistics)

CURRENT TEACHING AT TTU

https://www.Departments.ttu.edu/math/teaching/current_schedules.php

SPRING 2026

MATH 4000-D02 ACTUARIAL MATHEMATICS FOR LIFE CONTINGENT RISKS

MATH 8000-006 DOCTOR'S DISSERTATION

MATH 6351 D01 QUANTITATIVE FINANCE

MATH 5099-D21 INDEPENDENT STUDY

MATH 7000-016 RESEARCH: ANALYTICS OF PORTFOLIOS OF EQUITY ETFs

STAT 7000-008 RESEARCH: BRIDGING TREASURY-BOND DISLOCATION

STAT 7000-009 RESEARCH: OPTION PRICING MODEL WITH DRIFTED LEVY SUBORDINATORS

STAT 7000-018 RESEARCH: TRINOMIAL TREES FOR MODERN STOCHASTIC INTEREST RATE MODELS

STAT 7000-022 RESEARCH: TECHNICAL ANALYSIS AND MARKET EFFICIENCY UNDER A RATIONAL-FINANCE LENS

PUBLICATIONS: BOOKS & MONOGRAPHS

Y He, WB Lindquist, SZ Rachev, D Lauria, Risk Management for Cryptocurrency Portfolios, Walter de Gruyter GmbH & Co KG 2025

W. Brent Lindquist, Svetlozar T. Rachev, Yuan Hu, and Abootaleb Shirvani, Advanced Tools for Risk Management, Springer series, "Dynamic Modeling and Econometrics in Economics and Finance," Springer, 2022.
<https://www.springer.com/series/5859/books?page=1>

Frank J. Fabozzi, Sergio M. Focardi, Svetlozar T. Rachev, and Bala Arshanapalli, Basics of Financial Econometrics: Tools, Concepts, and Asset Management Applications, Wiley, 2014.
<https://onlinelibrary.wiley.com/doi/book/10.1002/9781118856406.2>

Stoyan Stoyanov, Svetlozar Rachev, and Frank Fabozzi, Optimal Portfolio Management in Highly Volatile Markets, Scholars Press, 2013
<https://www.amazon.com/Optimal-Portfolio-Management-Volatile-Markets/dp/3639514130>

S. T. Rachev, L. B. Klebanov, S. V. Stoyanov, and F. Fabozzi, The Methods of Distances in the Theory of Probability and Statistics, John Wiley, 2013
<https://www.springer.com/gp/book/9781461448686>

S. T. Rachev, Y. Kim, M. Bianchi, and F. Fabozzi, Financial Models with Levy Processes and Volatility Clustering, Springer, 2011
http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470482354_descCd-tableOfContents.html

S. T. Rachev, S. V. Stoyanov, and F. Fabozzi, A Probability Metrics Approach to Financial Risk Measures, Wiley-Blackwell, 2011
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-1405183691.html>

Rachev, S. T., Hoechstetter, M., Fabozzi, F., Focardi, S., Probability and Statistics for Finance, John Wiley, Finance, 2010
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470400935.html>

L. Klebanov, S. T. Rachev, and F. Fabozzi, Robust and Non-Robust Models in Statistics, NOVA-Science Publishers, 2009
https://www.novapublishers.com/catalog/product_info.php?products_id=10251

S. Trueck and S. T. Rachev, Rating Based Modeling of Credit Risk: Theory and Application of Migration Matrices, Academic Press Advances Finance, 2008
http://www.elsevier.com/wps/find/bookdescription.cws_home/716895/description#description



SVETLOZAR (ZARI) TODOROV RACHEV

Rachev, S. T., Stoyanov, S., Fabozzi, F., Advanced Stochastic Models, Risk Assessment and Portfolio Optimization: The Ideal Risk, Uncertainty, and Performance Measures, John Wiley, Finance, 2007
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-047005316X.html>

S. T. Rachev, J. Hsu, B. Bagasheva, and F. Fabozzi, Bayesian Methods in Finance, John Wiley, 2007
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471920835.html>

S. T. Rachev, S. Mittnik, Frank J. Fabozzi, S. Focardi, and T. Jasic, Financial Econometrics: From Basics to Advanced Modeling Techniques, John Wiley, 2007
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471784508.html>

A. Chernobai, S. T. Rachev, and F. Fabozzi, Operational Risk: A Guide to Basel II Capital Requirements, Models and Analysis, John Wiley, 2007
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471780510.html>

L. Klebanov, T. Kozubowski, and S. T. Rachev, Ill-Posed Problems in Probability and Stability of Random Sums, NOVA Science Publishers, 2006
https://www.novapublishers.com/catalog/product_info.php?products_id=4546

S. T. Rachev, C. Menn, and F. Fabozzi, Fat-Tailed and Skewed Asset Return Distributions: Implications for Risk Management, Portfolio selection and Option Pricing, John Wiley, 2005
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471718866.html>

S. T. Rachev and S. Mittnik, Stable Paretian Models in Finance, Series in Financial Economics and Quantitative Analysis, John Wiley, 2000
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471953148.html>

S. T. Rachev and L. Rueschendorf, Mass Transportation Problems, Vol II: Applications, Springer, 1999
<http://www.springer.com/statistics/book/978-0-387-98352-3>

S. T. Rachev and L. Rueschendorf, Mass Transportation Problems, Vol I: Theory, Springer, 1998
http://www.springer.com/mathematics/probability/book/978-0-387-98350-9construction_of.html?id=2_V9AAAAIAAJ

S. T. Rachev, Probability Metrics and the Stability of Stochastic Models, Wiley, 1991
<http://www.springer.com/mathematics/probability/book/978-0-387-98350-9>

PUBLICATIONS: HANDBOOKS & SPECIAL VOLUMES

Rachev, S. T., Probability Metrics and the Stability of Stochastic Models, Wiley, Chichester, New York, 1991
http://books.google.com/books/about/Probability_metrics_and_the_stability_of.html?id=5grvAAAAIAAJ

V. Kashnikov and S. T. Rachev, Mathematical Methods for Construction for Queuing Models, Nauka, (in Russian) 1988; English translation, Wadsworth & Brooks/Cole Advanced Books, 1990.
http://books.google.com/books/about/Mathematical_methods_for_construction_of.html?id=2_V9AAAAIAAJ

A. Kakosyan, L. Klebanov, and S. T. Rachev, Quantitative Criteria for Convergence of Measures, Ajastan Press, 1978 (in Russian)

W. Lindquist and S. Rachev, Mathematical and Empirical Finance, a special issue of the Journal of Risk & Financial Management, 2023

S. T. Rachev, E. Sun, F. Fabozzi, O. Charchano, and Y. Kim, A Quasi-Maximum Likelihood Estimation Strategy for Value-at Risk Forecasting: Application to Equity Index Futures? Markets, Handbook of Financial Econometrics and Statistics, SpringerReference.com April 15, 2013

S. T. Rachev, A. Chernobai, and F. Fabozzi, Composite Goodness-of-Fit Tests for Left Truncated Loss Sample, SpringerReference.com April 15, 2013

S. T. Rachev and F., Fabozzi (Guest Editors), Special Issue on Studies in Mathematical and Empirical Finance, Mathematical Methods of Operations Research, Vol. 69/3, July 2009
<http://www.springerlink.com/content/1432-2994/69/3/>



SVETLOZAR (ZARI) TODOROV RACHEV

G. Bol, S. T. Rachev, and R. Würth (Editors), Risk Assessment: Decisions in Banking and Finance, Springer/Physika, 2009
<http://www.springer.com/business+%26+management/finance/book/978-3-7908-2049-2>

S. T. Rachev (Editor), Handbook of Computational and Numerical Methods in Finance, Birkhäuser, 2004
<http://www.springer.com/birkhauser/mathematics/book/978-0-8176-3219-9>

G. Bol, G. Nakhaeizadeh, S. T. Rachev, T. Rieder, and K. Vollmer (Editors), Credit Risk: Measurement, Evaluations and Management, Springer Verlag, Physika-Verlag Series, 2003
<http://www.springer.com/business+%26+management/finance/book/978-3-7908-0054-8>

S. T. Rachev (Editor), Handbook of Heavy Tailed Distributions in Finance, North Holland Handbooks of Finance, Elsevier, 2003
http://www.elsevier.com/wps/find/bookdescription.cws_home/622468/description#description

S. T. Rachev (Editor), Mathematical Models in Market and Credit Risk Editor, Mathematical Methods of Operations Research, Vol. 55/2, 2002, Springer
<http://www.springerlink.com/content/1432-2994/55/2/>

S. Mittnik and S. T. Rachev (Editors), Stable Non-Gaussian Models in Finance and Econometrics, Mathematical and Computer Modeling, 29(10–12), 1999
<http://www.sciencedirect.com/science/journal/08957177/29>

S. Mittnik and S. T. Rachev (Editors), Distributional Modeling in Finance, Mathematical and Computer Modeling, 29(10–12), 1999
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C. Heyde, Yu. Prohorov, R. Pyke, and S. T. Rachev (Editors), Athens Conference on Applied Probability and Time Series Analysis, Springer Verlag, 1995
<http://www.springer.com/mathematics/probability/book/978-0-387-94788-4>

G. Anastassiou and S. T. Rachev (Editors), Approximation, Probability and Related Fields, Plenum Press, 1994
<http://books.google.com/books?id=w-vuAAAAMAAJ&q=Approximation,+Probability+and+Related+Fields&dq=Approximation,+Probability+and+Related+Fields>

PUBLICATIONS: PAPERS (2026-2009)

2026

Option-Implied Probabilities and Bond Valuation, A Jha, A Jaffri, ST Rachev, FJ Fabozzi, The Journal of Fixed Income 35 (3), 6-17. (January 2, 2026)

2025

A Unified Financial Index for Geopolitical and Environmental Risks: Construction, Risk Management, and Derivative Applications, AM Jaffri, A Shirvani, A Jha, ST Rachev, FJ Fabozzi (June 01, 2025)

Misspecified Fear or Model Choice? Evidence from Financial Markets, A Jha, F Papazyan, ST Rachev, Evidence from Financial Markets. (November 04, 2025)

Hedging via Perpetual Derivatives: Trinomial Option Pricing and Implied Parameter Surface Analysis
J Gnawali, WB Lindquist, ST Rachev
Journal of Risk and Financial Management 18 (4), 192

Beyond the bid-ask: strategic insights into spread prediction and the global mid-price phenomenon
Y He, A Shirvani, B Shao, S Rachev, F Fabozzi
Econometric Reviews, 1-42

Optimizing portfolios with Pakistan-exposed exchange-traded funds: Risk and performance insight
A Jaffri, A Shirvani, A Jha, ST Rachev, FJ Fabozzi
Journal of Risk and Financial Management 18 (3), 158

Environmental, Social and Governance-Valued Portfolio Optimization and Dynamic Asset Pricing, D Lauria, WB Lindquist, S Mittnik, ST Rachev, Journal of Risk and Financial Management 18 (3), 153



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Alternatives to Classical Option Pricing, WB Lindquist, ST Rachev, Annals of Operations Research 346 (1), 489-509

Editorial for the Special Issue of Journal of Risk and Financial Management: Featured Papers in Mathematics and Finance
SZT Rachev, WB Lindquist, Journal of Risk and Financial Management 18 (1), 43

2024

Y Hu, WB Lindquist, ST Rachev, FJ Fabozzi, Option Pricing Using a Skew Random Walk Binary Tree, Journal of Risk and Financial Management 17 (4), 138

T. V. Mahanama, A. Shirvani, S. Rachev, and F. J. Fabozzi. The financial market of indices of socioeconomic well-being, Journal of Risk and Financial Management 17 (1), 35,
<https://doi.org/10.3390/jrfm17010035>. (2024)

A. Jha, A. Shirvani, S. T. Rachev, F. J. Fabozzi. Beyond the Traditional VIX: A Novel Approach to Identifying Uncertainty Shocks in Financial Markets. Journal of Risk and Financial Management, 18(1), 11.

S. Rachev, N. Asare Nyarko, B. Omotade, P. Yegon. Bachelier's market model for ESG asset pricing. Journal of Risk and Financial Management, 17(12), 553.

D. Lauria, J. Park, Y. Hu, W. B. Lindquist, S. T. Rachev, F. J. Fabozzi. An Empirical Implementation of the Shadow Riskless Rate. Risks, 12(12), 187.

W. B. Lindquist, S. T. Rachev. Alternatives to classical option pricing. Annals of Operations Research, 1-21.

J. R. Bailey, W. B. Lindquist, S. T. Rachev. Hedonic Models Incorporating Environmental, Social, and Governance Factors for Time Series of Average Annual Home Prices. Journal of Risk and Financial Management, 17(8), 375.

Shirvani, A., Rachev, S.T., and Fabozzi, F.J. (2024). A rational finance explanation of the stock predictability puzzle. Review of Financial Economics, 42(3), 316–327.

Shirvani, A., Mittnik, S., Lindquist, W.B., and Rachev, S. (2024). Bitcoin Volatility and Intrinsic Time Using Double-Subordinated Lévy Processes. Risks, 12(5), 82.

Abudurexiti, N., He, K., Hu, D., Rachev, S.T., Sayit, H., and Sun, R. (2024). Portfolio analysis with mean-CVaR and mean-CVaR-skewness criteria based on mean-variance mixture models. Annals of Operations Research, 336(1), 945–966.

Hu, Y., Lindquist, W.B., Rachev, S.T., and Fabozzi, F.J. (2024). Option Pricing Using a Skew Random Walk Binary Tree. Journal of Risk and Financial Management, 17(4), 138.

Hu, Y., Lindquist, W.B., and Rachev, S.T. (2024). Sustainability-valued discrete option pricing in complete markets. Journal of Sustainable Finance & Investment, 1–35.

2023

Y. He, Y. Hu, and S. Rachev The implied views of bond traders on the spot equity market, Frontiers in Applied Mathematics and Statistics 9, 1324079,
<https://doi.org/10.3389/fams.2023.1324079> (2023)

N. A. Nyarko, B. Divilgama, J. Gnawali, B. Omotade, S. T. Rachev, and P. Yegon. Exploring dynamic asset pricing within Bachelier's market model, Journal of Risk and Financial Management 16 (8), 352. (2023)

L. B. Klebanov, Y. V. Kuvaeva-Gudoshnikova, and S.T. Rachev. Heavy-tailed probability distributions: Some examples of their appearance, Mathematics 11 (14), 3094.(2023)

Y. He and S. Rachev. Exploring implied certainty equivalent rates in financial markets: Empirical analysis and application to the electric vehicle industry, Journal of Risk and Financial Management 16 (7), 344. (2023)

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