

Professional Address

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Professional Experience

Education

1996 Dr. rer. nat. (PhD) in Mathematics, University of Bremen, Germany

1993 Diplom (MSc) in Mathematics, University of Bremen, Germany

Employment

- 2015/01 – Professor of Financial Economics, Department of Economics, University of Manchester, United Kingdom
- 2013/07 – Adjunct Professor, Department of Finance, NHH - Norwegian School of Economics, Bergen, Norway
- 2005/01 – 2014/12 Centenary Chair in Financial Mathematics, Professor, Leeds University Business School and School of Mathematics, University of Leeds, United Kingdom
- 2011/04 – 2013/01 Marie Curie Visiting Professor of Finance, NHH - Norwegian School of Economics, Department of Finance and Management Science, Bergen, Norway
- 2002/08 – 2004/12 Associate Professor, Institute of Economics, University of Copenhagen, Denmark
- 2002/04 – 2013/08 Associated Member, National Centre of Competence in Research *Financial Valuation and Risk Management* (project Behavioural and Evolutionary Finance), Switzerland
- 1999/10 – 2002/08 Assistant Professor ('Oberassistent'), Institute for Empirical Research in Economics, Department of Economics, University of Zurich, Switzerland

1999/03 – 1999/09	Assistant Professor (‘wissenschaftlicher Assistent’), Department of Economics, University of Bielefeld, Germany
1996/07 – 1999/02	Research Fellow (‘wissenschaftlicher Angestellter’), Department of Economics, University of Bielefeld, Germany
1993/07 – 1996/06	Research Fellow (‘wissenschaftlicher Angestellter’), Department of Mathematics, Institute for Dynamical Systems, University of Bremen, Germany
1990 – 1993	Research Assistant (‘studentische Hilfskraft’), Department of Mathematics, Institute for Dynamical Systems, University of Bremen, Germany
1988 – 1990	Teaching Assistant (‘Tutor’), Department of Mathematics, University of Bremen, Germany

Grants

2017/07–2023/08	Student Experience Internship (SEI) grants, in total about £24,000, University of Manchester, UK
2016/06	Conference on Market Microstructure: Current Issues and Challenges, June 2016 (granted to the Department of Finance, NHH), NOK 151,535, Financial Market Fund (Finansmarkedsfondet), Norway
2016/06	NFI Lecture Series Grant <i>sponsoring David Easley and Maureen O’Hara’s visit to NHH</i> (granted to the Department of Finance, NHH), \$30,000, Norwegian Finance Initiative, Norges Bank Investment Management, Norway
2013/05 – 2013/08	Trimester Program <i>Stochastic Dynamics in Economics and Finance—New Approaches to Modeling Market Dynamics and Equilibrium</i> (with Rabah Amir, University of Arizona, and Igor V. Evstigneev, University of Manchester), € 320,000, Hausdorff Research Institute for Mathematics, University of Bonn, Germany
2013/01 – 2013/12	Norwegian Government incentive grant for European-financed research, awarded by NHH (with Terje Lensberg, NHH), €95,000
2011/10	Leadership Chair in Insurance Mathematics and Actuarial Science (with Iain Clacher), new joint post between the School of Mathematics and Leeds University Business School, £400,000, University of Leeds
2011/06 – 2012/09	Marie Curie Fellowship (with Terje Lensberg, NHH), €190,307, European Research Council
2008/06 – 2012/06	NOTUR - The Norwegian Metacenter for Computational Science (with Terje Lensberg, NHH), 420,000 hours processor time
2008/05 – 2010/12	Stability of Financial Markets: An Evolutionary Approach (with Terje Lensberg, NHH), NOK 1.341 million, Finance Market Fund, Norway
2007/11 – 2009/10	Knowledge Transfer Partnership with Yorkshire Bank/National Australia Bank Group (with Barbara Summers), £134,989, EPSRC and Yorkshire Bank. Awarded the highest grade <i>outstanding</i> by the KTP Grading Panel in 2010 and the ESRC award for <i>Best Application of Social Science in a KTP 2011</i>
2006/10 – 2008/10	University of Leeds Fund for International Research Collaborations, £13,635, University of Leeds

Research Visits

Department of Banking and Finance, University of Zurich, Switzerland (2012–), NCCR Fin-Risk and Swiss Banking Institute, University of Zurich, Switzerland (2007, 2008, 2010, 2011), Department of Finance and Management Science, Norwegian School of Economics, Bergen, Norway (2011–), Norwegian School of Economics and Business Administration, Bergen, Norway (2007-2010), Trento Summer School, PhD course Agent-Based Finance (invited lecturer), Italy (July 2007), Stanford University, Department of Economics (Visiting Scholar, sponsored by Mordecai Kurz, £20,000 grant awarded by Ecoscientia Stiftung, October 2001 to March 2002); University of Applied Sciences Merseburg, Department of Computer Science (September 2001); Università Cattolica del Sacro Cuore, Department of Economics (March 2001); Pennsylvania State University, Department of Economics (September 2000); University of Virginia at Charlottesville, Department of Economics (March and October 2000); Universidad de Alicante, Facultad de Ciencias Económicas (Guest lecturer, Erasmus grant of the European Union (September 1999); Hong Kong University of Science and Technology, Department of Mathematics (December 1998); Università di Pisa, Dipartimento Matematica Applicata, Italy (March 1998); University of Vienna, Department of Economics (March 1998); Universidad de Alicante, Facultad de Ciencias Económicas (Training and Mobility of Researchers grant of the European Union (September 1997); University of Illinois at Urbana-Champaign, Department of Aeronautical and Astronautical Engineering (October/November 1994, May 1997 and February 2000)

Professional Activities

External examiner, MSc Financial Technology, University of Nottingham, Nottingham University Business School, 2022/23–

External examiner, PG modules in Finance and related areas, University of Leicester, School of Business, 2022/23–

Internal examiner, PhD, University of Manchester, Alliance Manchester Business School, Mohammad Dehghani, 2022

External examiner, PhD, University of York, Department of Mathematics, Álvaro Guinea Juliá, 2022

External reviewer, Promotions Committee for Professor, University of Leicester, 2021

External reviewer, Appointment Committee for Professor, University of the Chinese Academy of Sciences, 2021

Associate editor, Journal of Optimization Theory and Applications, 2020–

Member, Air France and KLM Quality Observer panel, 2020–

External member, Midterm Evaluation Committee, Assistant Professor in Finance, Norwegian School of Economics (NHH), 2020

Editorial board member of *Sustainability* (Section Economic and Business Aspects of Sustainability), 2020–

Internal examiner, PhD, University of Manchester, School of Social Sciences, Sergei Belkov, 2018

Programme director, BSc Economics, University of Manchester, 2018–

- Member, Steering Committee, Conference on *Evolution and Financial Markets*, MIT, 2018
- External examiner, MSc Computational Finance, King's College London, Postgraduate Faculty of Natural and Mathematical Sciences, 2017/18–2021/22
- External examiner, Mathematical Finance, UG and PG modules, MSc Mathematical Finance and MSc Financial Engineering, University of York, 2015/16–2018/19
- External member, PhD committee, University of Zurich, Department of Banking and Finance, Anastasiia Sokko, 2018
- Reviewer for the *Austrian Science Fund* (FWF), 2017 and 2019
- External examiner, PhD, University of Liverpool, School of Management, Fei Su, 2017
- External member, PhD committee, University of Zurich, Department of Banking and Finance, Sabine Elmiger, 2016
- Chair of organizing committee, Jan Mossin Memorial Symposium on Financial Markets, Norwegian School of Economics (NHH), Bergen, June 9-10, 2016
- Organizer, PhD short course on Financial Market Microstructure, taught by Maureen O'Hara and David Easley (both Cornell University), Norwegian School of Economics (NHH), Bergen, June 6-7, 2016
- Programme external assessor for BSc Actuarial and Financial Mathematics, University of Malaya, Kuala Lumpur, Malaysia, 2013/14–2017/18
- External examiner, PhD, University of Manchester, School of Social Sciences, Faculty of Humanities, Mikhail Zhitlukhin, 2013
- Editorial board member of *Quantitative Finance Letters*, 2013–2016
- Organizer of the Trimester Program *Stochastic Dynamics in Economics and Finance—New Approaches to Modeling Market Dynamics and Equilibrium*, Hausdorff Research Institute for Mathematics, University of Bonn, Germany, May-August 2013 (with Rabah Amir and Igor V. Evstigneev)
- Editor of the Special Issue 'Behavioral and Evolutionary Finance' in *Annals of Finance*, Volume 9, Issue 2, 2013 (with Igor V. Evstigneev and William T. Ziemba)
- Organizer of the mini-symposium *Financial Mathematics and Financial Markets* at the British Applied Mathematics Conference, Leeds, UK, April 2013
- Editor of the Special Issue 'Stochastic Financial Economics' (Volume 1 and 2) in *Mathematics and Financial Economics*, Volume 5, Issues 3 and 4, 2011 (with Sjur D. Flåm)
- Organizer of the sessions *Evolutionary Finance I & II* at the conference of the Society for the Advancement of Economic Theory, Faro, Portugal, June/July 2011 (with Igor V. Evstigneev)
- Co-organizer of the International Conference *Stochastic Economics and Finance*, Bergen, Norway, June 2011
- External assessor, Chair in Economics and Finance, University of Leicester, February 2011
- Programme director, BSc Actuarial Mathematics, BSc Economics and Mathematics, BSc Economics and Statistics, BSc Management and Mathematics and BSc Mathematics with Finance at the School of Mathematics, University of Leeds (2010-2014), MSc Financial Mathematics at Leeds University Business School, University of Leeds (2005-2014)

External examiner, UG and PG modules in Mathematical Economics and Microeconomics 2011–2014, and Programme Examiner, MSc Financial Economics 2012–2014, School of Social Sciences, University of Manchester

External examiner, PhD, University of Manchester, Economics, Faculty of Social Sciences, Le Xu, 2010

External examiner, Centre for Computational Finance and Economic Agents, School of Computer Science and Electronic Engineering, University of Essex, 2008–2012

External advisor, MSc Financial Economics, School of Social Sciences, University of Manchester, 2009

Principal investigator, Knowledge Transfer Partnership (KTP) with Yorkshire Bank/National Australia Bank Group, November 2007–October 2009. Awarded the highest grade *outstanding* by the KTP Grading Panel in 2010. ESRC award for *Best Application of Social Science in a KTP 2011*

Organizer of the *Manchester-Leeds Conference on Mathematical Economics and Finance*, Manchester, UK, May 2008 (with Igor V. Evstigneev)

Doctoral courses and seminars on topics in Evolutionary Finance, NCCR FinRisk *Financial Valuation and Risk Management*, University of Zurich, Switzerland, 2006–2008. Invited speaker Trento Summer School, PhD course Agent-Based Finance, July 2007

Member of appointment committees (Professorships in Economics and Finance), University of Copenhagen 2006 and 2007

Reviewer for the *Programme of Excellence at University of Copenhagen*, 2007

Organizer of the workshop *Dynamic Interaction in Markets*, University of Leeds, UK, October 2006

External examiner, University of Manchester, Economics, Faculty of Social Sciences, Dhruv Kapoor (MPhil 2006)

Editor of the Special Issue ‘Evolutionary Finance’ in *Journal of Mathematical Economics*, Volume 41, Number 1-2, 2005 (with Thorsten Hens)

Co-organizer of the Dynamic Economic Theory workshop *Economic Growth and Institutions*, Copenhagen, Denmark, June 2005

Co-Director, CASIF–Centre for Advanced Studies in Finance, Leeds University Business School, 2005–2015

Chair of Ph.D. assessment committee: Thomas Harr (Copenhagen) *Essays in Banking Regulation and Financial Crises*, April 2004

Member of the *Dynamic Economic Theory* project, Copenhagen, 2002–2005

Member of the European Science Foundation project *Behavioural Models in Economics and Finance*, 2001–2004

Reviewer for (*Economics/Finance*) *Annals of Finance*, *Annals of Operations Research*, *B.E. Journal of Theoretical Economics*, *Decisions in Economics and Finance*, *Econometrica*, *Economic Theory*, *Energy Journal*, *European Economic Review*, *Finance and Stochastics*, *Financial Markets and Portfolio Management*, *Games and Economic Behavior*, *Global Finance Journal*, *International Economic Review*, *International Journal of Theoretical and Applied Finance*, *International Journal of Game Theory*, *Journal of Economic Behavior and Or-*

ganization, Journal of Economic Dynamics and Control, Journal of Economic Interaction and Coordination, Journal of Economic Theory, Journal of Evolutionary Economics, Journal of Finance, Journal of Futures Markets, Journal of Mathematical Economics, Journal of Macroeconomics, Macroeconomics Dynamics, Mathematical Social Sciences, Mathematics and Financial Economics, Quantitative Finance, Research in Economics, Review of International Economics, Revue Finance, Scandinavian Journal of Economics, South African Journal of Economics, Sustainability, The Financial Review, The Manchester School, Theoretical Economics, Wiley; (Mathematics/other) Stochastic Processes and their Applications, Stochastics and Dynamics, Journal of Applied Mathematics and Stochastic Analysis, Mathematical Methods in the Applied Sciences, Administrative Sciences, Advances in Complex Systems, Applied and Computational Mathematics, Applied Mathematics-A Journal of Chinese Universities, Axioms, Discrete Dynamics in Nature and Society, Dynamical Systems, Dynamics and Stability of Systems, Entropy, Electronic Journal of Evolutionary Modeling and Economic Dynamics, Fluctuation and Noise Letters, Intelligent Systems in Accounting, Finance and Management, International Journal of Solids and Structures, International Journal of Technology Management, Journal of Bioeconomics, Journal of Computational and Applied Mathematics, Physics Letters A, PNAS (Proceedings of the National Academy of Sciences of the United States of America); and (Research Funding Agencies, Conferences) Bachelier Finance Society, European Finance Association, Leverhulme Trust, Natural Sciences and Engineering Research Council of Canada.

PhD Students

Dai Xi (rational herding in financial markets, expected completion 2026) with Michele Berardi, School of Social Science, University of Manchester

Michael Grebe (Machine learning, financial economics, expected completion 2023) with Ekaterina Kazak, School of Social Science, University of Manchester

Esmail Babaei Khezerloo, co-supervisor (von Neumann growth models in Finance, completed 2020) with Igor V. Evstigneev, School of Social Science, University of Manchester

Myroslav Pidkuyko (Housing, Durable Consumption, and Asset Prices, completed 2019) with Raffaele Rossi, School of Social Science, University of Manchester

Martin Anastasov (Modelling Investment Strategies: Bayesian Learning, Regime Switches and Evolutionary Finance, completed Autumn 2015) with Jan Palczewski, School of Mathematics, University of Leeds

James Fung (An Agent-based Model of the Interbank Market: Reserve and Capital Adequacy Requirements, completed Spring 2015) with Jan Palczewski, School of Mathematics, University of Leeds

Tongya Wang (Behavioural Biases and Evolutionary Dynamics in an Agent-Based Financial Market, completed Summer 2014) with Jan Palczewski, School of Mathematics, University of Leeds

Zhidi Du (Optimal Investment under Liquidity Costs, completed Spring 2014) with Jan Palczewski, School of Mathematics, University of Leeds

Huamao Wang (Optimal Portfolio Choice under Transaction Costs and Partial Information, completed Winter 2010) with Jan Palczewski, School of Mathematics, University of Leeds

Dan Ladley (Essays on Computational Finance, completed Summer 2008) with Netta Cohen, School of Computing, University of Leeds

Alena Audzeyeva (The Determinants of Yield Spreads on Sovereign Eurobonds: An Empirical Study, completed Spring 2008) with Nick Wilson, Credit Management Research Centre, University of Leeds

Yiling Xing (Banking Credit Risk in the Peoples Republic of China, completed Autumn 2006) with Nick Wilson, Credit Management Research Centre, University of Leeds

Teaching Experience

Economics (Financial, Micro, Mathematical, Growth, Industrial), Finance (Trading, Market Microstructure, Asset Pricing), Mathematics (Finance, Stochastics, Dynamics).

Research

Research Interests

Finance and Financial Economic Theory (in particular mathematical financial economics and evolutionary finance), dynamic economic theory, random dynamical systems.

Books

1. *Mathematical Financial Economics: A Basic Introduction* (with Igor V. Evstigneev and Thorsten Hens), Springer, 2015 (233 pages).
2. *Handbook of Financial Markets: Dynamics and Evolution*, editor (with Thorsten Hens), volume in the Handbooks in Finance series (edited by William T. Ziemba), North-Holland, 2009 (608 pages).

Recent working papers

1. BeVIXed: Trading Fear in the Volatility Complex (with Chakravarthy Varadarajan), SSRN Working Paper No. 4249320, 2022.
2. Strategic Complementarity and Substitutability of Investment Strategies (with Nikolay Dostkov and Thorsten Hens), SFI Working Paper 04-22, 2022.
3. Economic Growth in the UK: Rolling with the Punches (with Julia Wardley-Kershaw), University of Manchester, Economics Discussion Paper No. EDP-2108, 2021.
4. International Trade. Smarten up to Talk the Talk (with Levi Haas), University of Manchester, 2019.
5. The Resolution of Long-Run Risk (with Myroslav Pidkuyko and Raffaele Rossi), University of Manchester, 2019.

Publications

1. Non-Standard Errors (with Albert J. Menkveld and 341 other co-authors), *Journal of Finance*, forthcoming.
2. Perspectives on the Future of Growth (with Julia Wardley-Kershaw), *World*, 3(2), 299–312, 2022.
3. Bearing the Scars: Access to Growth and the Age of Knowledge (with Julia Wardley-Kershaw), *Histories*, 2(4), 405–425, 2022.
4. Economic Growth in the UK: Growth's Battle with Crisis (with Julia Wardley-Kershaw), *Histories*, 2(4), 374–404, 2022.

5. Economic Growth in the UK: The Inception (with Julia Wardley-Kershaw), *World*, 3(2), 162–174, 2022.
6. Evolution in Pecunia (with Rabah Amir, Igor V. Evstigneev, Thorsten Hens and Valeriya Potapova), *Proceedings of the National Academy of Sciences of the United States of America (PNAS)*, 118(26), Article e2016514118, 2021.
7. Cold Play: Learning Across Bimatrix Games (with Terje Lensberg), *Journal of Economic Behavior & Organization*, 185, 419–441, 2021.
8. Cryptocurrencies: Concept and Current Market Structure (with Octavian Nica and Karolina Piotrowska), in *Handbook Cryptofinance: A New Currency for a New Economy* (Goutte, S., Saadi, S., eds.), World Scientific, Chapter 1, 2021.
9. A Multidimensional Fatou Lemma for Conditional Expectations (with Esmaeil Babaei and Igor V. Evstigneev), *Positivity*, 25, 1543–1549, 2021.
10. Von Neumann-Gale Dynamics, Market Frictions, and Capital Growth (with Esmaeil Babaei, Igor V. Evstigneev and Mikhail V. Zhitlukhin), *Stochastics*, 93(2), 279–310, 2021.
11. Von Neumann-Gale Dynamics and Capital Growth in Financial Markets with Frictions (with Esmaeil Babaei, Igor V. Evstigneev and Mikhail V. Zhitlukhin). *Mathematics and Financial Economics*, 14(2), 283–305, 2020.
12. Behavioral Equilibrium and Evolutionary Dynamics in Asset Markets (with Igor V. Evstigneev, Thorsten Hens and Valeriya Potapova). *Journal of Mathematical Economics*, 91, 121–135, 2020.
13. Patience is a Virtue — In Value Investing (with Thorsten Hens). *International Review of Finance*, 20(4), 1019–1031, 2020.
14. Escaping the Backtesting Illusion (with Thorsten Hens and Mathis-Hendrik Woesthoff). *Journal of Portfolio Management*, 46(4), 81–93, 2020.
15. Pricing Defaulted Italian Mortgages (with Michela Pelizza), *Journal of Risk and Financial Management*, 13(2), Article 31, 2020.
16. Log-optimal and Rapid Paths in von Neumann-Gale Dynamical Systems (with Esmaeil Babaei and Igor V. Evstigneev). *Journal of Mathematical Analysis and Applications*, 481(2), Article 123489, 2020.
17. Herding in Smart-Beta Investment Products (with Eduard Krkoska). *Journal of Risk and Financial Management*, special issue ‘Risk Analysis and Portfolio Modelling’, 12, Article 47, 2019.
18. Front-Running and Market Quality: An Evolutionary Perspective on High Frequency Trading (with Thorsten Hens and Terje Lensberg), *International Review of Finance*, 18, 727–741, 2018.
19. Itchy Feet vs Cool Heads: Flow of Funds in an Agent-based Financial Market (with Jan Palczewski and Tongya Wang). *Journal of Economic Dynamics and Control*, 63, 53–68, 2016.
20. Evolutionary Behavioural Finance (with Igor V. Evstigneev and Thorsten Hens). In *The Handbook of Post Crisis Financial Modelling* (Haven, E., Molyneux, P., Wilson, J.O.S., Fedotov, S., Duygun, M., eds.), Palgrave MacMillan, Chapter 9, pp. 214–234, 2016.
21. Fragmentation and Stability of Markets (with Dan Ladley, Terje Lensberg and Jan Palczewski). *Journal of Economic Behavior & Organization*, 119, 466–481, 2015.

22. Costs and Benefits of Financial Regulation: Short-Selling Bans and Transaction Taxes (with Terje Lensberg and Dan Ladley). *Journal of Banking and Finance*, 51, 103–118, 2015.
23. Dynamic Portfolio Optimization with Transaction Costs and State-dependent Drift (with Jan Palczewski, Rolf Poulsen and Huamao Wang). *European Journal of Operational Research*, 243, 921–931, 2015.
24. Hedging without Sweat: A Genetic Programming Approach (with Terje Lensberg). *Quantitative Finance Letters*, 1, 41–46, 2013.
25. Introduction: Behavioral and Evolutionary Finance (with Igor V. Evstigneev and William T. Ziemba). *Annals of Finance*, 9, 115–119, 2013.
26. Asset Market Games of Survival: A Synthesis of Evolutionary and Dynamic Games (with Rabah Amir and Igor V. Evstigneev). *Annals of Finance*, 9, 121–144, 2013.
27. Forecasting Customer Behaviour in a Multi-service Financial Organisation: A Profitability Perspective (with Alena Audzeyeva and Barbara Summers). *International Journal of Forecasting*, 28, 507–518, 2012.
28. Introduction to the special issue *Stochastic Financial Economics, Volume 2* and Preface (with Sjur D. Flåm). *Mathematics and Financial Economics*, 5(4), 231–232 and 229, 2011.
29. Local Stability Analysis of a Stochastic Evolutionary Financial Market Model With a Risk-free Asset (with Igor V. Evstigneev and Thorsten Hens). *Mathematics and Financial Economics*, 5, 185–202, 2011.
30. Introduction to the special issue *Stochastic Financial Economics, Volume 1* and Preface (with Sjur D. Flåm). *Mathematics and Financial Economics*, 5(3), 159–160 and 157, 2011.
31. An Evolutionary Explanation of the Value Premium Puzzle (with Thorsten Hens, Terje Lensberg and Peter Woehrmann). *Journal of Evolutionary Economics*, 21, 803–815, 2011.
32. Consumption Paths under Prospect Utility in an Optimal Growth Model (with Reto Foellmi and Rina Rosenblatt-Wisch). *Journal of Economic Dynamics and Control*, 35, 273–281, 2011.
33. Linearization and Local Stability of Random Dynamical Systems (with Igor V. Evstigneev and Sergey A. Pirogov). *Proceedings of the American Mathematical Society*, 139, 1061–1072, 2011.
34. Survival and Evolutionary Stability of the Kelly Rule (with Igor V. Evstigneev and Thorsten Hens). In *The Kelly Capital Growth Investment Criterion: Theory and Practice* (Leonard C. MacLean, Edward O. Thorp and William T. Ziemba, eds.), Chapter 20, pp. 273–284, World Scientific, 2011.
35. Growing Wealth with Fixed-mix Strategies (with Michael A. H. Dempster and Igor V. Evstigneev). In *The Kelly Capital Growth Investment Criterion: Theory and Practice* (Leonard C. MacLean, Edward O. Thorp and William T. Ziemba, eds.), Chapter 29, pp. 427–455, World Scientific, 2011.
36. The Role of Country, Regional and Global Market Risks in the Dynamics of Latin American Yield Spreads (with Alena Audzeyeva). *Journal of International Financial Markets, Institutions & Money*, 20, 404–422, 2010.
37. From Discrete to Continuous Time Evolutionary Finance (with Jan Palczewski). *Journal of Economic Dynamics and Control*, 34, 913–931, 2010.

38. Market Selection of Constant Proportions Investment Strategies in Continuous Time (with Jan Palczewski). *Journal of Mathematical Economics*, 46, 248–266, 2010.
39. An Explicit Expression to the Locally R-minimizing Hedge of a European Call in the Hull and White Model (with Christian-Oliver Ewald and Zhaojun Yang), *Quantitative and Qualitative Analysis in Social Sciences*, 4(1), 1–18, 2010.
40. Risk Minimization in Stochastic Volatility Models: Model Risk and Empirical Performance (with Rolf Poulsen and Christian-Oliver Ewald). *Quantitative Finance*, 9, 693–704, 2009.
41. Do Stylised Facts of Order Book Markets Need Strategic Behaviour? (with Dan Ladley). *Journal of Economic Dynamics and Control*, 33, 817–831, 2009.
42. (Un)anticipated Technological Change in an Endogenous Growth Model (with Bruce A. Conway and Rina Rosenblatt-Wisch). *Studies in Nonlinear Dynamics & Econometrics*, 13:(1), Article 3, 2009.
43. Evolutionary Finance (with Igor V. Evstigneev and Thorsten Hens). In *Handbook of Financial Markets: Dynamics and Evolution* (Thorsten Hens and Klaus R. Schenk-Hoppé, eds.), Chapter 9, pp. 507–566, North-Holland, 2009.
44. Globally Evolutionarily Stable Portfolio Rules (with Igor V. Evstigneev and Thorsten Hens). *Journal of Economic Theory*, 140, 197–228, 2008.
45. Stochastic Equilibria in von Neumann–Gale Dynamical Systems (with Igor V. Evstigneev). *Transactions of the American Mathematical Society*, 360, 3345–3364, 2008.
46. Financial Markets. The Joy of Volatility (with Michael A. H. Dempster and Igor V. Evstigneev). *Quantitative Finance*, 8, 1–3, 2008.
47. Pure and Randomized Equilibria in the Stochastic von Neumann–Gale Model (with Igor V. Evstigneev). *Journal of Mathematical Economics*, 43, 871–887, 2007.
48. The Great Capitol Hill Baby Sitting Co-op: Anecdote or Evidence for the Optimum Quantity of Money? (with Thorsten Hens and Bodo Vogt). *Journal of Money, Credit and Banking*, 39, 1305–1333, 2007.
49. Volatility-induced Financial Growth (with Michael A. H. Dempster and Igor V. Evstigneev). *Quantitative Finance*, 7, 151–160, 2007.
Reprinted in: *Introduction to Quantitative Fund Management* (M.A.H. Dempster, G. Mitra and G. Pflug, eds.), Chapter 4, pp. 67–84, Chapman & Hall/CRC Financial Mathematics Series, Taylor and Francis, 2008.
50. On the Evolution of Investment Strategies and the Kelly Rule – A Darwinian Approach (with Terje Lensberg). *Review of Finance*, 11, 25–50, 2007.
51. The von Neumann-Gale Model and its Stochastic Generalizations (with Igor V. Evstigneev). In *Handbook on Optimal Growth 1. Discrete Time* (Rose-Anne Dana, Cuong Le Van, Tapan Mitra and Kazuo Nishimura, eds.), Chapter 12, pp. 337–379, Springer, 2006.
52. Evolutionary Stable Stock Markets (with Igor V. Evstigneev and Thorsten Hens). *Economic Theory*, 27, 449–468, 2006.
53. Markets Do Not Select For a Liquidity Preference as Behavior Towards Risk (with Thorsten Hens). *Journal of Economic Dynamics and Control*, 30, 279–292, 2006.
54. Poverty Traps and Business Cycles in a Stochastic Overlapping Generations Economy with S-shaped Law of Motion. *Journal of Macroeconomics*, 27, 275–288, 2005.

55. Market Selection and Survival of Investment Strategies (with Rabah Amir, Igor V. Evstigneev and Thorsten Hens). *Journal of Mathematical Economics*, 41, 105–122, 2005.
56. Evolutionary Stability of Portfolio Rules in Incomplete Markets (with Thorsten Hens). *Journal of Mathematical Economics*, 41, 43–66, 2005.
57. Evolutionary Finance: Introduction to the Special Issue (with Thorsten Hens). *Journal of Mathematical Economics*, 41, 1–5, 2005.
58. Resuscitating the Cobweb Cycle. *Journal of Forecasting*, 23, 621–624, 2004.
59. Survival of the Fittest on Wall Street (with Thorsten Hens). In *Institutioneller Wandel, Marktprozesse und dynamische Wirtschaftspolitik (Proceedings of the VI. Buchenbach Workshop)* (M. Lehmann-Waffenschmidt, A. Ebner and D. Fornahl, eds.), Metropolis-Verlag, Marburg, pp. 339–367, 2004.
60. Financial Markets and Stochastic Growth (with Leonard J. Mirman). *Review of International Economics*, 11, 219–236, 2003.
61. Exponential Growth of Fixed-Mix Strategies in Stationary Asset Markets (with Michael A. H. Dempster and Igor V. Evstigneev). *Finance and Stochastics*, 7, 263–276, 2003.
62. An Application of Evolutionary Finance to Firms Listed in the Swiss Market Index (with Thorsten Hens and Martin Stalder). *Swiss Journal of Economics and Statistics*, 138, 465–487, 2002.
63. Sample-Path Stability of Non-Stationary Dynamic Economic Systems. *Annals of Operations Research*, 114, 263–280, 2002.
64. From Rags to Riches: On Constant Proportions Investment Strategies (with Igor V. Evstigneev). *International Journal of Theoretical and Applied Finance*, 5, 563–574, 2002.
65. Market Selection of Financial Trading Strategies: Global Stability (with Igor V. Evstigneev and Thorsten Hens). *Mathematical Finance*, 12, 329–339, 2002.
66. Is There a Golden Rule for the Stochastic Solow Growth Model? *Macroeconomic Dynamics*, 6, 457–475, 2002.
67. Economic Growth and Business Cycles: A Critical Comment on Detrending Time Series. *Studies in Nonlinear Dynamics and Econometrics*, 5, 75–86, 2001.
68. Random Fixed Points in a Stochastic Solow Growth Model (with Björn Schmalfuss). *Journal of Mathematical Economics*, 36, 19–30, 2001.
69. Random Dynamical Systems in Economics. *Stochastics and Dynamics*, 1, 63–83, 2001.
70. An Evolutionary Model of Bertrand Oligopoly (with Carlos Alós-Ferrer and Ana B. Ania). *Games and Economic Behavior*, 33, 1–19, 2000.
71. The Evolution of Walrasian Behavior in Oligopolies. *Journal of Mathematical Economics*, 33, 35–55, 2000.
72. Bounds on Sample Paths of Stochastic Nonlinear Systems – A Lyapunov Function Approach. In *IUTAM Symposium on Nonlinearity and Stochastic Structural Dynamics (Chennai 1999)* (S. Narayanan and R. N. Iyengar, eds.), pp. 249–260, Kluwer Academic Publishers, Dordrecht, 2001.
73. Random Attractors – A Brief Introduction and Some Applications. *ZAMM - Journal of Applied Mathematics and Mechanics*, 79 Suppl. 3, S831–S834, 1999.

74. The Stochastic Brusselator: Parametric Noise Destroys Hopf Bifurcation (with Ludwig Arnold and Gabriele Bleckert). In *Stochastic Dynamics* (H. Crauel and V. M. Gundlach, eds.), Chapter 4, pp. 71–92, Springer, New York, 1999.
75. Random Attractors – General Properties, Existence and Applications to Stochastic Bifurcation Theory. *Discrete and Continuous Dynamical Systems*, 4, 99–130, 1998.
76. Toward an Understanding of Stochastic Hopf Bifurcation: A Case Study (with Ludwig Arnold and N. Sri Namachchivaya). *International Journal of Bifurcation and Chaos*, 6, 1947–1975, 1996.
77. Stochastic Bifurcation: Concept and Examples (with V. M. Gundlach). Proceedings of the International Conference on Nonlinearity, Bifurcation, and Chaos: The Doors to the Future (J. Awrejcewicz and C.-H. Lamarque, eds.), pp. 28–33, 1996.
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