


# Marco Bee

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## Personal details

Born February 1st, 1969.

Italian citizen.

Married, one daughter.

## Education

B.A. in Economics, 1993, University of Trento - Italy. Thesis: *La Relazione fra Tassi di Cambio Spot e Forward: un Approccio di Cointegrazione*. Advisors: R.G. Avesani and G. Passamani. Summa cum laude.

Ph.D. in Theoretical Statistics, 1998, University of Trento - Italy. Thesis: *Misure Normali Multivariate: Inferenza con Dati di Dimensioni Diverse*. Advisors: B. Flury and M.N. Gorla.

Visiting Research Associate, Department of Mathematics, Indiana University (August 1996 - June 1997).

## Previous Employment

September 1998 - March 1999: Expert in data processing at Informatica Trentina SpA, Trento.

April 1999 - January 2005: financial researcher at the Banca Intesa Risk Management & Research department. Promoted to the senior staff in July 2001. Head of the credit risk quantitative methods group since February 2003.

## Academic positions

January 2005 - September 2012: Assistant professor in Economic Statistics, Faculty of Economics, University of Trento.

October 2012 - December, 2020: Associate professor in Economic Statistics, Department of Economics and Management, University of Trento.

December 2020 - : Full professor in Economic Statistics, Department of Economics and Management, University of Trento.

April 2015 - : Member of the board of the PhD program in Economics and Management, University of Trento.

September 2019 - : Director of the Master in Finance, Department of Economics and Management, University of Trento.

National Scientific Qualification to full professor in:

Economic Statistics (scientific sector SECS-S/03, competition sector 13/D2), March 30, 2017;

Econometrics (scientific sector SECS-P/05, competition sector 13/A5), March 20, 2018.

## Funded research projects

Member of the project “Evaluation models and tools for assessment of innovation and sustainable development at the EU level”, College of Europe, Bruges, European Commission, December 2005 - September 2006. Senior expert: G. Espa.

Member of the PRIN project “The role of financial fragility and of default risk in the contagion processes of the systemic crises”. PI: D. Delli Gatti, 2007.

Junior expert in the project “Analysis of e-Inclusion impact resulting from advanced R&D based on economic modelling in relation to innovation capacity, capital formation, productivity, and empowerment”, College of Europe, Bruges, funded by the European Commission, August 2009 - September 2010.

Member of the project “Emerging methods for high-dimensional and geo-coded data with financial and economic applications” Department of Economics and Management, University of Trento, December 2019. PI: Emanuele Taufer.

PI of the PRIN project “Prediction and causal inference on the tail index for policy decisions”, June 2023 - June 2025.

## Grants and Awards

Fund for Basic Research (Fondo per le Attività Base di Ricerca) 2017, issued by the Italian Ministry of Education, University and Research.

The paper: Bee M., Dupuis, D.J. and Trapin, L. (2018), “Realized Extreme Quantile: A Joint Model for Conditional Quantiles and Measures of Volatility with EVT Refinements”, *Journal of Applied Econometrics*, 33, 398-415 is one of the top 20 most read papers in *Journal of Applied Econometrics* in 2017-18.

## Other scientific and professional activities

Consultant for the “Procura della Repubblica presso il Tribunale di Trento” for technical assessments concerning public auctions (2005).

Consultant for ANIA, Telespazio SpA and Agriconsulting SpA for the construction of “SIGRA - Sistema Integrato per la Gestione del Rischio assicurativo da Alluvione”. In charge of the development and implementation of models for forecasting and simulating flood events (September 2005 - September 2006).

Consultant for “CIR Food scarl” in the verification ordered by the Tribunale Regionale di Giustizia Amministrativa, concerning the announcement for the catering service for Provincia Autonoma di Trento, University of Trento, municipalities and other local authorities (March 2014).

## Programming languages

High level languages: R, Matlab, Gauss, T<sub>E</sub>X. Basic knowledge of High Performance Computing.

## Teaching

Teaching assistant for the course “Statistica”, Faculty of Sociology, University of Trento, 1997-1998.

Teaching assistant for the course “Statistica Aziendale”, Laurea in Economia e Gestione Aziendale, University of Trento, 2004-2005.

Teaching assistant for the course “Statistica”, Faculty of Economics, University of Trento, academic years 2005-2006 to 2007-2008.

**Ingegneria Finanziaria**, Master in Banca, Impresa e Mercati Finanziari, University of Trento, academic years 2004-2005 to 2010-2011.

**Laboratorio 3: Simulazione Finanziaria**, Master in Banca, Impresa e Mercati Finanziari, University of Trento, academic years 2005-2006 to 2010-2011.

**Risk Management S**, Master in Scienze Statistiche ed Economiche, University of Milano - Bicocca, 2006-2007 and 2007-2008.

**Quantitative Methods I**, Master in International Management, University of Trento, academic years 2008-2009 to 2015-2016.

**Quantitative Models for Business Decision Making**, Master in Innovation Management, University of Trento, academic years 2010-2011 to 2013-2014.

**Data Analysis and Forecasting**, Master in Innovation Management, University of Trento, academic years 2014-2015 and 2015-2016.

**Statistics (intensive course)**, Master in Economics, University of Trento, academic years 2012-2013 to 2016-2017.

**Analisi dei Dati e Statistica**, bachelor in Amministrazione Aziendale e Diritto, University of Trento, academic years 2016-2017 and 2017-2018.

**Financial Markets**, PhD in Economics and Management, Interdepartmental Centre for Training to Research in Economics and Management, University of Trento, 2005.

**Methods and Concepts in International Studies II**, PhD in International Studies, School of International Studies, University of Trento, April-May 2013.

**Statistics and Regression**, Doctoral Programme in Economics and Management, Doctoral School of Social Sciences, University of Trento, academic year 2017-2018.

**Laboratorio: Simulazioni Finanziarie**, Master in Finance, University of Trento, academic years 2011-2012 to 2018-2019.

**Data Analysis and Forecasting**, Master in Innovation Management and Master in International Management, University of Trento, academic years 2016-2017 to 2023-2024.

**Quantitative Methods for Market Analysis**, Master in International Management and Master in Innovation Management, University of Trento, academic years 2018-2019 to 2021-2022.

**Time Series (advanced)**, Master in Social Foresight, Department of Sociology and Social Research, University of Trento, academic year 2019-2020.

**Workshop on Financial Simulation**, Master in Finance, University of Trento, academic years 2019-2020 to 2023-2024.

**Data Analysis and Statistics**, Bachelor in Economics and Management, University of Trento, academic years 2020-2021 to 2023-2024.

## Other courses

“Modelli di portafoglio per la gestione attiva del rischio di credito ed il Credit VaR”, ABI Formazione - Area Credit, percorso Misurazione, Milano, June 16-17, 2005; May 10-11, 2006; June 27-28, 2007; June 25-26, 2009; May 17-18, 2010; June 15-16, 2011; July 2-3, 2012; September 16-17, 2013.

“Linear and non-linear time series analysis”, summer school “Reaction - R: Economics in Action”, Trento, September 5-8, 2017.

## Languages

English: fluent (oral and written).

German: scholastic.

## Publications

### Articles in Journal Citation Reports journals

1. Bee M. and Flury B. (2002), “A Problem of Dimensionality in Normal Mixture Analysis”, *Scandinavian Journal of Statistics*, 29, 485-500.
2. Bee M. (2004), “Testing for Redundancy in Normal Mixture Analysis”, *Communications in Statistics - Simulation & Computation*, 33, 915-936.
3. Bee M. (2005), “Estimating Rating Transition Probabilities with Missing Data”, *Statistical Methods & Applications*, 14, 127-141.
4. Bee M., Cozzani M., Manfredi M., Mutinelli S. and Siciliani G. (2008), “Dental Arch Changes Following Rapid Maxillary Expansion”, *European Journal of Orthodontics*, 30, 469-476.
5. Bee M., Benedetti R. and Espa G. (2008), “Spatial Models for Flood Risk Assessment”, *Environmetrics*, 19, 725-741.
6. Bee M. (2009), “Importance Sampling for Sums of Lognormal Distributions with Applications to Operational Risk”, *Communications in Statistics - Simulation & Computation*, 38, 939-960.
7. Benedetti, R., Bee M. and Espa G. (2010), “A Framework for Cut-off Sampling in Business Survey Design”, *Journal of Official Statistics*, 26, 651-671.
8. Arbia G., Bee M. and Espa G. (2011), “Aggregation of Regional Economic Time Series with Different Correlation Structures”, *Geographical Analysis*, 43, 78-103.
9. Bee, M. (2011), “Adaptive Importance Sampling for Simulating Copula-based Distributions”, *Insurance: Mathematics & Economics*, 48, 237-245.
10. Verdecchia F., Bee M., Lombardo L., Sgarbanti C. and Gracco A. (2011), “Influence of Anterior Teeth Alignment on Peer Perception in a Population of 8 to 10-year-olds”, *European Journal of Orthodontics*, 33, 155-160.
11. Taufer E., Leonenko, N. and Bee, M. (2011), “Characteristic Function Estimation of Ornstein-Uhlenbeck-based Stochastic Volatility Models”, *Computational Statistics & Data Analysis*, 55, 2525-2539.
12. Bee, M., Riccaboni, M. and Schiavo, S. (2011), “Pareto versus Lognormal: a Maximum Entropy Test”, *Physical Review E*, 84, 026104.

13. Bee M. (2012), "Dynamic VaR Models and the Peaks over Threshold Method for Market Risk Measurement: an Empirical Investigation during a Financial Crisis", *Journal of Risk Model Validation*, 6, 3-45.
14. Bee, M., Benedetti, R. and Espa G. (2013), "On Maximum Likelihood Estimation of a Pareto Mixture", *Computational Statistics*, 28, 161-178.
15. Bee, M. (2013), "A Maximum Entropy Approach to Loss Distribution Analysis", *Entropy*, 15, 1100-1117.
16. Bee M., Riccaboni, M. and Schiavo, S. (2013), "The size distribution of US cities: not Pareto, even in the tail", *Economics Letters*, 120, 232-237.
17. Arbia, G., Bee M. and Espa, G. (2013), "Testing Isotropy in Spatial Econometric Models", *Spatial Economic Analysis*, 8, 228-240.
18. Bee, M., Espa, G. and Giuliani, D. (2015), "Approximate Maximum Likelihood Estimation of the Autologistic Model", *Computational Statistics & Data Analysis*, 84, 14-26.
19. Bee M. (2015), "Statistical analysis of the Lognormal-Pareto distribution using Probability Weighted Moments and Maximum Likelihood", *Communications in Statistics - Simulation and Computation*, 44, 2040-2060.
20. Bee M., Dupuis, D.J. and Trapin, L. (2016), "Realizing the Extremes: Estimation of Tail-risk Measures from a High-frequency Perspective", *Journal of Empirical Finance*, 36, 86-99.
21. Bee M., Dupuis, D.J. and Trapin, L. (2016), "U.S. Stock Returns: Are there Seasons of Excesses?", *Quantitative Finance*, 16, 1453-1464.
22. Bee M. and Trapin, L. (2016), "A Simple Approach to the Estimation of Tukey's gh Distribution", *Journal of Statistical Computation and Simulation*, 86, 3287-3302.
23. Bee, M., Benedetti, R. and Espa, G. (2017), "Approximate Maximum Likelihood Estimation of the Bingham Distribution", *Computational Statistics & Data Analysis*, 108, 84-96.
24. Bee M. (2017), "Density Approximations and VaR Computation for Compound Poisson-Lognormal Distributions", *Communications in Statistics - Simulation and Computation*, 46, 1825-1841.
25. Bee M., Riccaboni, M. and Schiavo, S. (2017), "Where Gibrat meets Zipf: Scale and Scope of French Firms", *Physica A*, 481, 265-275.
26. Bee, M., Espa, G., Giuliani, D. and Santi, F. (2017), "A Cross-Entropy Approach to the Estimation of Generalised Linear Multilevel Models", *Journal of Computational and Graphical Statistics*, 26, 695-708.
27. Bee, M., Riccaboni, M. and Trapin, L. (2017), "An Extreme Value Analysis of the Last Century Crises across Industries in the U.S. Economy", *Journal of Economic Dynamics and Control*, 81, 65-78.
28. Arbia, G., Bee, M., Espa, G. and Santi, F. (2017), "A Frequency Domain Test for Isotropy in Spatial Data Models", *Spatial Statistics*, 21, 262-278.
29. Arbia, G., Bee, M., Espa, G. and Santi, F. (2018), "Fitting Spatial Regressions to Large Datasets using Unilateral Approximations", *Communications in Statistics - Theory and Methods*, 47, 222-238.
30. Bee, M. and Schiavo, S. (2018), "Powerless: Gains from Trade when Firm Productivity is not Pareto Distributed", *Review of World Economics*, 154, 15-45.

31. Lattante, S., Pomponi, M.G., Conte, A., Marangi, G., Bisogni G., Patanella, A.K., Meleo, E., Lunetta, C., Riva, N., Mosca, L., Carrera, P., Bee, M., Zollino, M. and Sabatelli, M. (2018), "ATXN1 intermediate-length polyQ expansions are associated with Amyotrophic Lateral Sclerosis", *Neurobiology of Aging*, 64, 157.e1-157.e5.
32. Bee, M., Dickson, M.M. and Santi, F. (2018), "Likelihood-based Risk Estimation for Variance-Gamma Models", *Statistical Methods & Applications*, 27, 69-89.
33. Dickson, M.M., Giuliani, D., Espa, G., Bee, M., Taufer, E. and Santi, F. (2018), "Design-based Estimation in Environmental Surveys with Positional Errors", *Environmental and Ecological Statistics*, 25, 155-169.
34. Bee M., Dupuis, D.J. and Trapin, L. (2018), "Realized Extreme Quantile: A Joint Model for Conditional Quantiles and Measures of Volatility with EVT Refinements", *Journal of Applied Econometrics*, 33, 398-415.
35. Bee M. and Trapin, L. (2018), "Estimating and Forecasting Conditional Risk Measures with Extreme Value Theory: A Review", *Risks*, 6, 45.
36. Bee M. and Trapin, L. (2018), "A characteristic function-based approach to Approximate Maximum Likelihood Estimation", *Communications in Statistics - Theory and Methods*, 47, 3138-3160.
37. Bee M., Dupuis, D.J. and Trapin, L. (2019), "Realized Peaks over Threshold: a Time-Varying Extreme Value Approach with High-Frequency based Measures", *Journal of Financial Econometrics*, 17, 254-283.
38. Bee, M., Hambuckers, J. and Trapin, L. (2019), "Estimating Value-at-Risk for the g-and-h distribution: an indirect inference approach", *Quantitative Finance*, 19, 1255-1266.
39. Bee M. 2020 (online)/2022 (print), "Estimating the wrapped stable distribution via indirect inference", *Communications in Statistics - Simulation and Computation*, 51 (11), 6371-6387.
40. Bee, M., Hambuckers, J. and Trapin, L. (2021), "Estimating large losses in insurance analytics and operational risk using the g-and-h distribution", *Quantitative Finance*, 21, 1207-1221.
41. Bee, M., Hambuckers, J., Santi, F. and Trapin, L. (2021), "Testing a parameter restriction on the boundary for the g-and-h distribution: a simulated approach", *Computational Statistics*, 36, 2177-2200.
42. Bee, M. (2022), "The truncated g-and-h distribution: estimation and application to loss modeling", *Computational Statistics*, 37, 1771-1794.
43. Bee, M. and Hambuckers, J. (2022), "Modeling multivariate operational losses via copula-based distributions with g-and-h marginals", *Journal of Operational Risk*, 17(1), 81-111.
44. Bee, M. (2022), "On discriminating between lognormal and Pareto tail: an unsupervised mixture-based approach", *Advances in Data Analysis and Classification*, forthcoming. DOI: 10.1007/s11634-022-00497-4.
45. Bee, M., Soltani, A.R. and Tafakori, L. (2022), "Some analytical results on bivariate stable distributions with an application in operational risk", *Quantitative Finance*, 22, 1355-1369.
46. Hussin Adam Khatir, A.A. and Bee M. (2022), "Machine Learning Models and Data-Balancing Techniques for Credit Scoring: What Is the Best Combination?" *Risks*, 10, 169.
47. Bee, M. (2023), "Unsupervised mixture estimation via approximate maximum likelihood based on the Cramér - von Mises distance", *Computational Statistics & Data Analysis*, 185, 107764.

48. Pourkhanali, A., Tafakori, L. and Bee, M. (2023), "Forecasting Value-at-Risk using functional volatility incorporating an exogenous effect", *International Review of Financial Analysis*, 89, 102803.
49. Bazzana, F., Bee, M. and Hussin Adam Khatir, A.A. (2023), "Machine learning techniques for default prediction: an application to small Italian companies" *Risk Management*, forthcoming.

### Invited talks

1. Bee, M. and Espa, G. (2009), "Estimating auto-models with missing data", Statistical methods for the Analysis of Large Data-Sets, Pescara, September 23-25, 2009.
2. Bee, M., Benedetti, R., Espa, G. and Piersimoni, F. (2011), "Cut-Off Approach To The Design Of Longitudinal Business Surveys", ASA Joint Statistical Meetings, Miami, July 30 - August 4, 2011.
3. Bee, M., Dupuis, D.J. and Trapin, L. (2018), "Realized Peaks over Threshold: a Time-Varying Extreme Value Approach with High-Frequency based Measures", Department of Economics, University of Verona, March 1, 2018.
4. Bee, M., Hambuckers, J. and Trapin, L. (2019), "An improved approach for estimating large losses using the g-and-h distribution", 12th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, December 14-16, 2019.
5. Bee, M. (2021), "Realized Peaks over Threshold: a Time-Varying Extreme Value Approach with High-Frequency based Measures", International Workshop on Pattern Forecasting, Milan, January 11, 2021.

### Articles in refereed books

1. Bee M., Espa G. and Tamborini R. (2004), "Firms' Bankruptcy and Turnover in a Macroeconomy", in *The Complex Dynamics of Economic Interaction - Essays in Economics and Econophysics*, (eds M. Gallegati, A.P. Kirman and M. Marsili), Lecture Notes in Economics and Mathematical Systems, vol. 531, 79-106, Springer.
2. Bee M. (2006), "Estimating the Parameters in the Loss Distribution Approach: How can we Deal with Truncated Data?", in *The Advanced Measurement Approach to Operational Risk* (ed. E. Davis), Risk Books, 123-144.
3. Bee M., Espa G. and Gabriele R. (2007), "ICT as a General Purpose Technology (GPT): modelling its impact on performance using IFS", in *Modelling ICT as a General Purpose Technology: Evaluation Models and Tools for Assessment of Innovation and Sustainable Development at the EU Level* (eds P. Guerrieri and P.C. Padoan), Collegium, 35, chap. 5, 115-146, College of Europe, Bruges.
4. Bee M., Espa G., Gabriele R., Guerrieri P., Maggi B. and Padoan P.C. (2007), "General Purpose Technology in a structural model", in *Modelling ICT as a General Purpose Technology: Evaluation Models and Tools for Assessment of Innovation and Sustainable Development at the EU Level* (eds P. Guerrieri and P.C. Padoan), Collegium, 35, chap. 7, 172-190, College of Europe, Bruges.
5. Bee M. and Espa G. (2009), "Importance Sampling techniques for large quantile estimation in the Advanced Measurement Approach", in *Operational Risk Towards Basel III: Best Practices and Issues in Modeling, Management and Regulation* (ed. G.N. Gregoriou), chap. 8, 155-176, Wiley.
6. Bee M., Benedetti, R., Espa G. and Piersimoni, F. (2010), "On the Use of Auxiliary Variables in Agricultural Surveys Design", in *Agricultural Survey Methods* (eds R. Benedetti, M. Bee, G. Espa and F. Piersimoni), chap. 7, 107-132, Wiley.

7. Bee M., Espa G. and Gabriele R. (2011), "The e-Inclusion in Europe: a scenario analysis", in *The Economic Impact Of Digital Technologies: Measuring Inclusion and Diffusion in Europe* (eds P. Guerrieri and S. Bentivegna), chap. 7, 162-187, Edward Elgar.
8. Bee, M. (2013), "A Maximum Entropy Approach to the Measurement of Event Risk", in *Rethinking Valuation and Pricing Models: Lessons Learned from the Crisis and Future Challenges* (eds. C. Wehn, C. Hoppe and G.N. Gregoriou), Academic Press, Elsevier Inc., 375-385.
9. Bee M., Riccaboni M. and Schiavo S. (2019), "Distribution of city size: Zipf, Gibrat, Pareto Law", in *The Mathematics of Urban Morphology* (ed. L. D'Acci), 77-91, Birkhäuser Basel, Springer Nature.

### Articles in other refereed journals

1. Bee M. and Espa G. (1999) "Metodi Statistici per l'Interpolazione Areale: l'Algoritmo EM per Dati Continui", *Statistica Applicata*, 11 (3), 1-28.
2. Bee M. (2004), "Modelling Credit Default Swap Spreads by means of Normal Mixtures and Copulas", *Applied Mathematical Finance*, 11 (2), 125-146.
3. Bee M. and Espa G. (2008), "A Monte Carlo EM Algorithm for the Estimation of a Logistic Auto-logistic Model with Missing Data", *Letters in Spatial and Resource Sciences*, 1, 45-54.
4. Bee M. and Gatti G. (2016) "A Pairs Trading Strategy Based on Switching Regime Volatility for Commodity Futures", *Energy Risk*, December 2016, 29-35.

### Other publications

#### Articles

1. Bee M. (1997), "Un Problema Dimensionale in Analisi di Mistura Finita", *Quaderni di Statistica e Matematica Applicata alle Scienze Economico-sociali*, 20, 137-150.
2. Bee M. (2006), "Estimating and Simulating Loss Distributions with Incomplete Data", *OpRisk & Compliance*, 7, 36-41.
3. Bee M., Benedetti R., Espa G. and Piersimoni, F. (2013), Is it acceptable not to cover the smallest businesses in a business survey? How should such a cutoff be chosen?, *The Survey Statistician*, 67, 14-18.
4. Bee, M., Dickson, M.M., Giuliani, D., Piacentino, D., Santi, F. and Taufer, E. (2016), "La sopravvivenza immediata delle start-up italiane del settore manifatturiero sanitario: un'analisi multilevel", *Rivista di Economia e Statistica del Territorio*, 3, 11-22.

#### Books

1. Bee M., Espa G. and Micciolo R. (2002), *Esercizi di Statistica Nuovo Ordinamento*, Flashbook Drake.
2. Bee M. and Erzegovesi L. (2008), *I Modelli di Portafoglio per la Gestione del Rischio di Credito. Guida alla Misurazione e al Controllo dopo Basilea 2*, Bancaria.
3. Bee M., Espa G., Gabriele R., Maggi B. and Piras G. (2008), *Econometric Modeling Perspectives*, Nova-publishers.
4. Benedetti, R., Bee, M., Espa, G. and Piersimoni, F. (eds) (2010), *Agricultural Survey Methods*, Wiley.
5. Bee, M. and Santi, F. (2013), *Finanza Quantitativa con R*, Apogeo.



### Book chapters

1. Bee M. and Senati M. (2004), "La gestione del Rischio di Credito in Banca Intesa", in De Laurentis G., Saita, F. and Sironi, A. (eds), *Rating Interni e Controllo del Rischio di Credito*, Bancaria.
2. Bee M., Espa G., Gabriele R., Maggi B., Piras G. (2008), "Structural Models and Empirical Analysis of Technology Accumulation and Diffusion: a Continuous-time Econometric Approach". In Toggins, W.N. (ed.), *New Econometric Modeling Research*, Nova Science.

### Proceedings, working papers, contributed talks and other publications

1. Avesani R.G., Bee M. and Passamani G. (1993), "The Relation between Spot and Forward Exchange Rates: a Varying Trend Cointegration Analysis". In: Bulletin of the International Statistical Institute, vol. 55 - book 1. Proceedings of the 49th Session of the International Statistical Institute, Firenze, August 25 - September 2, 1993.
2. Bee M., Besana A. and Espa G. (1998), "L'Algoritmo EM per la Conversione di Dati Areali Continui", II National Conference of the "Federazione delle Associazioni Scientifiche per le Informazioni Territoriali e Ambientali", Bolzano, November 24-27, 1998.
3. Avesani R.G., Bee M., Ceci V. and Vecchiato W. (2000), "Exploring a Methodology for Estimating the Price of Volatility", V International Conference on Metodi Quantitativi per le Scienze Applicate, Siena, May 31 - June 3, 2000.
4. Bee M. (2001), "Mixture Models for VaR and Stress Testing", Tech report nr. 12, Alea, Centro di Ricerca sui Rischi Finanziari, University of Trento.
5. Bee M. (2002), "Un Modello per l'Incorporazione del Rischio Specifico nel VaR", Tech report nr. 13, Alea, Centro di Ricerca sui Rischi Finanziari, University of Trento.
6. Bee M. and Espa G. (2002), "Misture Normali e Valore a Rischio", quaderno DISA 68, Department of Computer and Management Sciences, University of Trento.
7. Bee M., Espa G. and Tamborini R., "Firms' Bankruptcy and Turnover in a Macroeconomy", Workshop on Economics and Heterogeneous Interacting Agents, Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, May 30 - June 1, 2002.
8. Bee M., Espa G. and Tamborini R., "Firms' Bankruptcy and Turnover in a Macroeconomy", Istituto di Teoria Economica e Metodi Quantitativi, Università Cattolica, Milano, June 23, 2003.
9. Bee M. and Senati M., "Gestione del Rischio di Credito in Banca Intesa", convegno su Rating Interni e Controllo del Rischio di Credito: Esperienze, Problemi e Soluzioni, Milano, Università Bocconi, March 31, 2004.
10. Bee M. and Gazzini A. (2004), "Testing the Profitability of Simple Technical Trading Rules: a Bootstrap Analysis of the Italian Stock Market", Tech report nr. 18, Alea, Centro di Ricerca sui Rischi Finanziari, University of Trento.
11. Bee M. and Espa G., "Metodi Statistici per la Determinazione del Rating Interno", Department of Computer and Management Sciences, University of Trento, April 18, 2005.
12. Bee M., "Modelling and Estimating Operational Losses", Department of Economics, University of Trento, May 4, 2005.
13. Bee M. (2005), "On Maximum Likelihood Estimation of Operational Losses", Discussion paper 2005.3, Department of Economics, University of Trento, [www-econo.economia.unitn. it\new\pubblicazioni\papers\3bee.pdf](http://www-econo.economia.unitn.it/new/pubblicazioni/papers/3bee.pdf).

14. Bee M. (2005), "Copula-based Multivariate Models with Applications to Risk Management and Insurance", Social Science Research Network: <http://ssrn.com/author=453173>.
15. Arbia G., Bee M. and Espa G. (2006), "Aggregation of Regional Economic Time Series with Different Correlation Structures", International Workshop on Spatial Econometrics and Statistics, Università LUISS, Roma, May 25-27, 2006.
16. Bee M., Benedetti R., Espa G. and Terpessi C. (2006), "Spatial Models for Flood Risk Assessment", International Workshop on Spatial Data Methods for Environmental and Ecological Processes, Foggia, September 14-15, 2006.
17. Bee M., Benedetti R. and Espa G. (2006), "Metodi ed Algoritmi per la Determinazione delle Soglie Multivariate di Censimento, Campionamento ed Esclusione di Aziende Agricole", Le Statistiche Agricole verso il Censimento del 2010: Valutazioni e Prospettive, Cassino, October 26-27, 2006.
18. Bee M. (2006), discussion of the paper "The Role of Heterogeneity in the Topology and Dynamics of Interbank Markets" by G. De Masi, workshop on Financial fragility and technological progress with heterogeneous agents and social interactions: models, simulations and empirical evidence, Trento, December 14-15, 2006.
19. Bee M., Benedetti R., Espa G., Ghizzoni T., Roth G., Rudari R., Taramasso A.C., Terpessi C. (2007), "On multi-variate flood scenario simulations", XXIV General Assembly of the International Union of Geodesy and Geophysics, Perugia, July 2-13, 2007.
20. Bee M., Benedetti R., Espa G., Ghizzoni T., Roth G., Rudari R., Taramasso A.C., Terpessi C. (2007) "Conditional probability approach to spatially distributed flood scenarios simulation", 9th Plinius Conference on Mediterranean Storms, International Congress Centre Villa Monastero, Varenna, September 10-13, 2007.
21. Arbia G., Bee M. and Espa G. (2007), "Effects of aggregation on spatially correlated time series", StatGIS conference 2007, Klagenfurt (Austria), September 24-26, 2007.
22. Bee M. (2007), "The Asymptotic Loss Distribution in a Fat-tailed Factor Model of Portfolio Credit Risk", Discussion paper 2007.1, Department of Economics, University of Trento, [www-econo.economia.unitn.it/new/publicazioni/papers/1.07\\_bee.pdf](http://www-econo.economia.unitn.it/new/publicazioni/papers/1.07_bee.pdf).
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58. Bee, M., Dupuis, D.J. and Trapin, L. (2015) "Realized Peaks Over Threshold: A high-frequency extreme value approach for financial time series", Cahiers du GERAD, G-2015-104.
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62. Bee, M., Riccaboni, M. and Trapin, L. (2015), "An extreme value analysis of the last century crises across industries in the U.S. Economy", International Conference Large-scale Crises: 1929 vs 2008, Ancona, December 17-19, 2015.
63. Bee, M., Dupuis, D.J. and Trapin, L. (2016), "Realized Peaks over Threshold", 44th Annual Meeting of the Statistical Society of Canada, May 29 - June 1, Brock University, St. Catharines.
64. Bee, M., Dickson M. M., Giuliani D., Santi F. (2016), "La probabilità di sopravvivenza delle imprese a un anno dalla nascita: un'analisi congiunta delle determinanti individuali di impresa e di contesto territoriale", 37-th Annual Scientific Conference of the Italian Association of Regional Studies, Ancona, September 20-22, 2016.
65. Dickson, M.M., Taufer, E., Bee, M., Giuliani, D. and Espa, G. (2016), "Sampling and modelling spatial data with locational errors", International workshop on Statistical inference for assessing and monitoring natural resources, Siena, 9-11 novembre 2016.
66. Bee, M., Dickson, M.M. and Santi, F. (2016), "Estimating the variance-gamma distribution: A comparison of algorithms and of estimated option prices", 10th International Conference on Computational and Financial Econometrics (CFE 2016), Seville, December 9-11, 2016.
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68. Bee, M., Espa, G., Giuliani, D., Dickson, M.M., Taufer, E. and Santi, F. (2017), "An EM-type algorithm for maximum likelihood estimation of spatial models with positional errors", 10th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, December 16-18, 2017.
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70. Bee, M., Hambuckers, J. and Trapin, L. (2018), "Estimating Value-at-Risk for the g-and-h distribution: an indirect inference approach", DEM working paper 2018/o8.
71. Bee, M. (2018), "Estimating the wrapped stable distribution via indirect inference", DEM working paper 2018/11.
72. Bee, M. (2018), "Estimating the wrapped stable distribution via indirect inference", 11th International Conference of the ERCIM WG on Computational and Methodological Statistics, Pisa, December 14-16, 2018.
73. Bee, M., Hambuckers, J. and Trapin, L. (2019), "An improved approach for estimating large losses in insurance analytics and operational risk using the g-and-h distribution", DEM working paper 2019/11.
74. Bee, M. and Hambuckers, J. (2020), "Modeling multivariate operational losses via copula-based distributions with g-and-h marginals", DEM working paper 2020/3.
75. Bee, M., "Pareto or lognormal? A classification approach", online presentation at the workshop Models and Learning for Clustering and Classification, Department of Economics and Business, University of Catania - September 2020.

76. Bee, M. (2020), "On discriminating between lognormal and Pareto tail: a mixture-based approach", DEM working paper 2020/9.
77. Bee, M. (2022), "Unsupervised Mixture Estimation via Approximate Maximum Likelihood based on the Cramér - von Mises distance", <https://arxiv.org/abs/2211.05847>.
78. Bee, M. (2022), "Approximate maximum likelihood estimation of the lognormal-GPD model with dynamic weights", 15th International Conference of the ERCIM WG on Computational and Methodological Statistics, London, 17-19 dicembre 2022.
79. Bee, M. (2023), "Unsupervised estimation of loss distributions via dynamic mixtures", ISBIS (International Society for Business and Industrial Statistics) – Brock University, Canada – July 13-14, 2023.

## Fellowships

Italian Statistical Society.

## Service to the profession

Member of the examination board of the PhD in Economic Statistics, "La Sapienza" University of Rome - 27th cycle (December 2014).

Member of the scientific and organizational committee of the workshop "Advances in Sampling Methods - Five lectures in order to understand the world of samplers", University of Trento, February 15, 2017.

Member of the examination board of the PhD in Economics and Management, University of Trento: October 18, 2019 and October 23, 2020.

Organizer of session CO138: *Heavy-tailed distributions for financial modeling*, COMPSTAT 2022 (24th International Conference on Computational Statistics, Bologna, August 23-26, 2022).

## Refereeing

Journal reviewer for: *Scandinavian Journal of Statistics*; *Quantitative Finance*; *European Journal of Operational Research*; *IBM Journal of Research and Development*; *European Journal of Finance*; *Regional Science and Urban Economics*; *Journal of Credit Risk*; *Insurance: Mathematics & Economics*; *Communications in Statistics - Simulation and Computation*; *Journal of Banking and Finance*; *Computational Statistics*; *Entropy*; *The American Statistician*; *Journal of Control and Decision*; *Review of Derivatives Research*; *Statistical Methods and Applications*; *International Journal of Financial Studies*; *International Statistical Review*; *Risks*; *Environmetrics*; *Physica A*; *Computational Statistics & Data Analysis*; *Journal of Computational and Applied Mathematics*; *Journal of Risk Model Validation*; *Empirical Economics*; *Journal of Operational Risk*; *Statistics and Computing*; *Statistical Papers*.

Reviewer for Mathematical Reviews from 2012 to 2020.

Scientific evaluator of two projects presented to the Swiss National Science Foundation (December 2011 and May 2013; August 2020).

Reviewer for Daniele Di Gennaro's PhD thesis ("Policy Evaluation and Spillover Effects"), PhD in Models for Economics and Finance, "La Sapienza" University of Rome - 29th cycle (October 2016).

Reviewer of Richard Ayisi's PhD thesis ("Essays on Informal Credit Intermediation and Monetary Policy Effectiveness"), PhD in Economics LASER, University of Milano, Brescia and Pavia - 30th cycle (September 2017).

### *Editorial work*

Guest Editor for the *Risks* special issue "Computational Methods in Quantitative Risk Management" (May 2020).

*Topical Advisor* for *Risks* (since January 2021).

### *Student advising*

Luca Trapin (PhD in Economics, IMT Lucca, March 2016), currently associate professor in Economic Statistics, Department of Statistical Sciences "Paolo Fortunati", University of Bologna.

Flavio Santi (PhD in International Economics and Finance, La Sapienza University of Rome, July 2016), currently associate professor in Economic Statistics, Department of Economics, University of Verona.

### *Software*

R package `tukeyGH`. The package can be downloaded from <https://cran.r-project.org/package=tukeyGH> and provides distribution, density and quantile functions of the g-and-h probability distribution, as well as functions for random number generation, parameter estimation and testing.

R package `LNPar`. The package can be downloaded from <https://cran.r-project.org/package=LNPar> and contains functions for simulation and estimation of the lognormal-Pareto mixture developed in Bee, M. (2022), "On discriminating between lognormal and Pareto tail: a mixture-based approach", *Advances in Data Analysis and Classification*, <https://doi.org/10.1007/s11634-022-00497-4>.

R package `FitDynMix`. The package can be downloaded from <https://cran.r-project.org/package=FitDynMix> and contains functions for simulation and estimation via Approximate Maximum Likelihood and minimum Cross-Entropy of the dynamic lognormal - generalized Pareto mixture developed in Bee, M. (2022), "Unsupervised Mixture Estimation via Approximate Maximum Likelihood based on the Cramér - von Mises distance".

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