

## **FRANCESCA BIAGINI**

*Citizenship: Italian, German; Marital Status: Married, 1 Child*

*Languages: Italian, English, French, German*

*Date of Birth: 31.7.1973*

*Department of Mathematics, Ludwig-Maximilians-Universität*

*München, Germany*

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### ***CURRENT RESEARCH INTERESTS***

Insurance markets modeling, mathematical models for financial asset bubbles, model uncertainty for insurance markets.

### ***ACADEMIC CAREER***

*Since November 2009: Full professor in Applied Mathematics (Chair, W3-Professorin in angewandter Mathematik), at the University of Munich (Ludwig-Maximilians Universität, LMU), Germany.*

*December 2016: Offer of the Chair in Financial Mathematics (Ruf auf eine W3-Professur in Finanzmathematik), from the University of Wien, Austria. Refused.*

*April 2008: Offer of the Chair in Financial and Insurance Mathematics (Ruf auf eine W3-Professur in Versicherungs- und Finanzmathematik), from the Leibniz Universität Hannover, Germany. Refused.*

*October 2005 - October 2009: Associate Professor in Applied Mathematics (W2-Professorin in Angewandter Mathematik), Department of Mathematics, Ludwig-Maximilians-Universität München (LMU), Germany.*

*January 1999 - September 2005: Ricercatore (Assistant Professor) in Probability and Statistics, Department of Mathematics, University of Bologna.*

## **EDUCATION**

*November 2001: PhD, Perfezionamento in Mathematical Finance* (mark: 70/70 cum laude) Scuola Normale Superiore of Pisa, Italy. Thesis title: *Quadratic hedging approach for interest rate models with stochastic volatility*. Thesis adviser: Prof. Maurizio Pratelli.

*October 1997: Degree in Mathematics from Scuola Normale Superiore of Pisa* (mark: 70/70 cum laude), Italy.

*October 1996: Laurea in Mathematics* (mark: 110/110 cum laude) University of Pisa, Italy. Thesis title: *Toric Varieties*. Thesis adviser: Prof. Margherita Galbiati.

*July 1992: Diploma of Liceo Scientifico* (mark: 60/60), High School Pistoia, Italy.

## **HONOURS**

*January 1, 2022 - December 31, 2023: Past President* of the **Bachelier Finance Society**.

*January 1, 2020 - December 31, 2021: President* of the **Bachelier Finance Society**.

*January 1, 2018 - December 31, 2019: Vice-President* of the **Bachelier Finance Society**.

*January 1, 2017 - December 31, 2019: Secretary* of the **SIAM Activity Group on Financial Mathematics and Engineering**.

*June 2010 - July 2013, September 2015 - September 2018: Professor II at the Center for Mathematics and Applications (CMA)*, University of Oslo, Norway.

*2015: Member of the scientific committee* of the 9th World Congress of the Bachelier Finance Society.

*January 2013 -December 2014: I have been appointed by the Italian Ministry of Research as foreign member in the Committee for the National Scientific Qualification for the scientific sector Mathematical Methods in Economics and in Financial and Actuarial Sciences.*

*January 2012 - December 2015: Member of the Council of the Bachelier Finance Society.*

*Since Spring 2010: Member of the Executive Board of the Munich Risk and Insurance Center (MRIC)* at the University of Munich.

## **EDITORIAL ACTIVITY**

*Since August 2013: Associate Editor* for the journal *Stochastic Analysis and Applications*.

*Since 2017: Associate Editor* for the journal *Rendiconti di Matematica*.

*Since 2018: Associate Editor* for the journal *Review of Derivatives Research (REDR)*. **Associate Editor** for **Springer Finance**.

*Since 2020: Associate Editor* for **Mathematical Finance**.

*Since 2022: Associate Editor* for *Decisions in Economics and Finance*.

## **SELECTED SERVICES at the University of Munich (LMU)**

*Since October 1, 2019: Vice-President of LMU for International Affairs and Diversity*.

*June 2011 - January 2017, October 2018 - September 2019: Head of the Department of Mathematics*.

*Since 2011: Coordinator of the exchange program International Master in Financial and Insurance Mathematics at the University of Munich*.

*2007 - 2019: Mentorin for the Faculty of Mathematics, Statistics and Informatics of the University of Munich: supervisor and coach of a group of mostly talented young female researchers. The Mentoring program is an activity of LMU Excellent*.

*2007 - 2019: Member of the Committee for Scientific Control of the University of Munich*.

*Since 2007: DAV (Deutscher Aktuar Verein, German Actuarial Association) korrespondentin*.

## **AWARDS**

*2019: Prinzessin Therese von Bayern Preis 2019*.

*2016: Zonta Clubpreis 2015 für herausragendes Management von Karriere und Familie, Zonta Club München*.

*2011: Bruti-Liberati Visiting Fellowship, University of Technology, Sydney, Australia*.

## ACADEMIC ACTIVITIES

### *CONFERENCES ORGANIZED*

*October 2023: Oberwolfach workshop New Challenges in the Interplay between Finance and Insurance.* In collaboration with Thorsten Schmidt, Hans-Jörg Albrecher, Beatrice Acciaio.

*August 2022: 2022 Gene Golub SIAM Summer School .* In collaboration with Agostino Capponi, Sebastian Jaimungal, Stefan Sturm.

*November 2022: Oberwolfach workshop New Challenges in the Interplay between Finance and Insurance.* In collaboration with Thorsten Schmidt, Monique Jeanblanc, Hans-Jörg Albrecher.

*June 4 - 7, 2019: SIAM Conference on Financial Mathematics and Engineering (FM19),* part of the organising committee.

*September 27 - 29, 2017: First GS Workshop on Mathematical Finance,* Gran Sasso Science Institute (GSSI). In collaboration with J. Fouque, M. Frittelli, P. Guasoni, P. Protter, M. Soner and GSSI.

*June 23, 2017: Recent Advances in Model Uncertainty,* LMU, Munich. In collaboration with T. Meyer-Brandis, C. Schmaling.

*October 5 - 7, 2016: International Workshop: Whats new in networks? Building bridges between computational, mathematical and statistical network analysis,* Center of Advanced Studies, LMU, Munich. In collaboration with G. Kauermann, C. Schmaling, T. Seidl, R. Zimmer.

*May 24, 2013: Workshop on Financial Bubbles,* LMU, Munich. Invited lecturers: H. Föllmer, D. Hobson, P. Protter, J. Scheinkman. In collaboration with H. Föllmer and P. Protter.

*October 27-28, 2011: Autumn School 2011: Mathematical methods in finance and insurance,* LMU, Munich. Invited lecturers: H. Albrecher, J. Teichmann. In collaboration with T. Meyer-Brandis and G. Svindland.

*October 21-22, 2010: Autumn School 2010: Mathematical methods in risk management and finance,* LMU, Munich. Invited lecturers: R. Cont, H. Föllmer. In collaboration with T. Meyer-Brandis.

*February 13, 2009: Winter School 2009: Modeling risk in electricity and other energy markets,* LMU, Munich. Invited lecturers: R. Carmona, T. Meyer-Brandis.

*July 5-6, 2007: Summer School 2007: Quantitative Risk Management,* LMU, Munich. Invited lecturers: P. Embrechts, R. Frey.

*June 29-30, 2006: Summer School 2006: Risk Measurement and Optimal Investment,* LMU, Munich. Invited lecturers: F. Delbaen, C. Rogers. In collaboration with D. Filipović.

***SOME SELECTED TALKS AT CONFERENCES AND UNIVERSITIES***

Conference Stochastic optimal control in Economics, Finance, and Learning theory. Conference in honour of Martin Schweizers 60th birthday, June 2023: “Deep learning for superhedging prices approximation and asset price bubbles detection”.

Bachelier Finance Society World Congress, online, June 2022: “Neural network approximations for the superhedging prices”.

University of Verona (virtual), October 2021: “Reduced-form setting under model uncertainty with non-linear affine intensities”.

Risk and Uncertainty meeting, University of Oxford (virtual), March 2021: “Reduced-form setting under model uncertainty with non-linear affine intensities”.

Bachelier seminar (virtual), November 27, 2020: “Reduced-form setting under model uncertainty with non-linear affine intensities”.

**SIAG/FME virtual seminars series**, October 29, 2020: “Reduced-form setting under model uncertainty with non-linear affine intensities”.

23rd International Congress on Insurance: Mathematics and Economics (IME), Munich, July 2019: “Extended Reduced-Form Framework for Non-Life Insurance”.

SIAM Conference on Financial Mathematics and Engineering (FM19), Toronto, June 2019: “Reduced-form framework under model uncertainty”.

Bachelier Finance Society World Congress, Dublin, July 2018: “Reduced-form framework under model uncertainty”.

International Workshop on Applied Probability, IWAP 2018 Budapest, June 20, 2018: “Reduced-form framework under model uncertainty”, (*invited speaker*).

University of Southern California, Los Angeles, USA, February 2018: “Financial Asset Bubbles under Model Uncertainty”.

UCSB, California, October 30, 2017: “Financial Asset Bubbles under Model Uncertainty”.

TU Berlin, June 29, 2017: “Financial Asset Bubbles under Model Uncertainty”.

Final Conference - Stochastic Dynamical Models in Mathematical Finance, Econometrics, and Actuarial Sciences, Lausanne, May 30, 2017: “Financial Asset Bubbles under Model Uncertainty”, (*invited speaker*).

University of Oxford, May 18, 2017: “Financial Asset Bubbles under Model Uncertainty”.

Workshop “Young Researchers in Robust Mathematical Finance”, ETH Zurich, April 27, 2017: “Financial Asset Bubbles under Model Uncertainty”, (*invited speaker*).

**SIAM Conference on Financial Mathematics & Engineering**, Austin, USA, November 2016: “Mathematical models for financial asset bubbles”, (*plenary speaker*).

Gran Sasso Science Institute, L’Aquila, Italy, June 10, 2016: “Optimal control with delayed information flow of systems driven by G-Brownian motion”.

**INdAM (Istituto Nazionale di Alta Matematica) Day**, University of Perugia, Italy, June 8, 2016: “Mathematical models for financial asset bubbles”, (*invited speaker*).

**7th General AMaMeF and Swissquote Conference**, Lausanne, Switzerland, September 2015: “The long-term swap rate and a general analysis of long-term interest rates”, (*plenary speaker*).

Labex Louis Bachelier - SIAM-SMAI Conference on Financial Mathematics: Advanced Modeling and Numerical Methods, Paris, France, June 2014: “Mathematical models for the formation of financial bubbles”, (*invited speaker*).

University of Southern California, Los Angeles, USA, February 2014: “Risk-Minimization for Life Insurance Liabilities”.

Columbia University, New York, USA, December 2013: “Mathematical models for the formation of financial bubbles”.

QMF 2012 Conference, Cairns, Australia, June 2012: “Hedging and valuation in hybrid markets” (**Bruti-Liberati Lecture**).

### **REFEREE FOR PEER REVIEWED JOURNALS**

*Annals of Probability, Annals of Applied Probability, Applied Mathematics and Optimization, Bernoulli, Decisions in Economics and Finance, Economic Dynamics and Control I, Finance and Stochastics, Journal of Multivariate Analysis, Mathematical Finance, Mathematics of Operations Research, Operations Research, Quantitative Finance, Rendiconti per gli studi economici quantitativi, Statistics and Probability Letters, Stochastics and Stochastics Reports, Stochastics, Stochastic Processes and their Applications.*

### **REVIEWER ACTIVITIES**

I have been member in evaluating committees or reviewer for the following institutions: *University of Lyon 1, University of Milano, ETH in Zurich, KTH in Stockholm, London School of Economics, International Selection Panel for the ARETÉ Junior Chair* - a program of the African Institute for Mathematical Sciences (AIMS) in collaboration with the Robert Bosch Stiftung, *Evaluation Panel Land Hessen, Swiss National Science Foundation, Deutsche Forschung Gemeinschaft, Stockholm University, Portuguese Evaluation Panel.*

### **SOME SELECTED RESEARCH VISITS**

*August 2013 - April 2014, January - March 2015, August 2017 - March 2018, March -April 2019, March -April 2020, September- December 2022:* UCSB, California, USA.

*2010, 2011, 2013, 2016:* Center of Mathematics and Applications (CMA), University of Oslo, Norway (each time 2 until 4 weeks).

*September 2008:* University of Evry, Paris, France (1 month).

*August 2004 - January 2005:* University of Oslo, Norway (6 months).

*December 1999:* Stockholm School of Economics “Handelshogskolan” (5 weeks).

### **BACHELOR AND MASTER STUDENTS**

Master/Bachelor Students: I have advised around 180 master students, also in collaboration with Allianz, Europe Assistance, Generali, Hypovereinsbank, MunichRe, Siemens AG, Swiss Life, SwissRe.

**PHD STUDENTS**

- (1) Niklas Walter, PhD thesis: *Topics on rough volatility models*, started in 2020.
- (2) Katharina Oberpriller, PhD thesis: *Topics on model uncertainty*, defended in 2022.
- (3) Thomas Reitsam, PhD thesis: *Asset price bubbles and dynamic super-replication under transaction costs*, defended in 2021.
- (4) Andrea Mazzon, PhD thesis: *Asset price bubbles in financial networks*, defended in 2018, in collaboration with T. Meyer-Brandis.
- (5) Yinglin Zhang, PhD thesis: *Insurance modeling in continuous time*, defended in 2018.
- (6) Jacopo Mancin, PhD thesis: *Topics in mathematical finance under uncertainty*, defended in 2017.
- (7) Maximilian Härtel, PhD thesis: *Long term interest rates modeling*, defended in 2015.
- (8) Sorin Nedelcu, PhD thesis: *Mathematical models for bubble generation on financial markets*, defended in 2014.
- (9) Jan Widenmann, PhD thesis: *Pricing of unemployment insurance products*, defended in 2013.
- (10) Irene Schreiber, PhD thesis: *Risk minimization for life insurance liabilities*, defended in 2012.
- (11) Yuliya Bregman, PhD thesis: *Pricing in new markets: an application to insurance and electricity products*, defended in 2009, in collaboration with T. Meyer-Brandis.
- (12) Cretarola Alessandra, PhD thesis: *Quadratic Hedging for Credit Risk*, defended in 2006.
- (13) Fuschini Serena, PhD thesis: *Discrete Approximation of Stochastic Integrals with respect to Fractional Brownian Motion*, defended in 2005, in collaboration with M. Campanino.
- (14) Masetti Massimo, PhD thesis: *Computational Procedures For Quadratic Hedging*, defended in 2004.



## FUNDS

*January 2018:* Professorship **Stiftungsprofessur Computational Financial and Insurance Mathematics**, financed by BayernLB for 5 years. Volume of funds: 310.00 Euro (in collaboration with T. Meyer-Brandis).

*March 2017:* 50.000 Euro by BayernLB to finance one year of the Professorship **Stiftungsprofessur Quantitative Financial Mathematics**, halbe Stelle.

*January 2017:* 20.000 Euro financed by VR meine Raiffeisenbank eG Altötting to support the activity of the Chair.

*Since 2010 - :* PhD grants financed by the Verein zur Förderung der Versicherungswissenschaft in München e.V. for (Funds obtained until date: circa 200.000 Euro).

*September 2014:* one Phd grant from Allianz: circa 60.000 Euro.

*December 2013/2015/2017:* I am one of the **founder of the Quantitative and Computational Systems Science Center, an interdisciplinary center to promote the interaction between Mathematics, Statistics and Informatics with other sciences (Biology, Chemistry, Medicine, Genetics, Physics, Economics)**. Funds obtained from the LMU: 300.000 Euro.

*July 2013:* I am part of the faculty of the project Financial Mathematics Post Crisis: Systemic Risk, that has been selected and financed by the Innovationsfond of the LMU Excellence Initiative (Funds obtained: 100.000 Euro).

*2009:* DAAD grant of 3.980 euro for Andrei Obukhovskii.

*2008:* Professorship **Stiftungsprofessur Quantitative Financial Mathematics**, halbe Stelle, financed by Allianz for 5 years. Volume of funds: 316.250 euro (63.250 per year).

*2008:* **PhD position** (halbe Stelle) financed by **SwissLife** to be established at the Mathematics Department for 3 years. Volume of funds: 120.000 (40.000 per year).

*2007:* **PI** of the **Visiting Professorship for Quantitative Finance and Insurance** from the **Excellence Program of the University of Munich (LMU) (Dritte Förderlinie der LMUexcellent)**. Volume of funds: 300.000 (100.000 per year).

*2004:* grant from CMA, the Center of Mathematics for Applications, University of Oslo, Norway, to spend a research period of 6 months at the Department of Mathematics of the University of Oslo.

*1999 and 2001:* grant from CNR, the Italian National Center for Research, within the "Short Term Mobility Program" for young researchers.

*1997:* **PhD grant** from ANIA (**Associazione Nazionale fra le Imprese Assicuratrici, National Association of the Italian Insurance Companies**) to attend the Doctoral Program in Mathematical Finance organized by the Scuola Normale Superiore of Pisa.

## PUBLICATIONS

### *PUBLISHED PAPERS*

- (1) Biagini, F., Mazzon, A., Meyer -Brandis, T., Oberpriller, K., (2023) *Liquidity based modeling of asset price bubbles via random matching*, SIAM J. Financial Math. 14 (4), 1304 - 1342.
- (2) Biagini, F., Mazzon, A., Perkkiö, A.-P., (2023) *Optional projection under equivalent local martingale measures*, Accepted on Finance and Stochastics.
- (3) Biagini, F., Bollweg, G. , Oberpriller, K., (2023) *Non-linear Affine Processes with Jumps*, Probability, Uncertainty and Quantitative Risk 8 (2).
- (4) Akhtari, B., Biagini, F., Mazzon, A., Oberpriller, K., (2023) *Generalized Feynman-Kac Formula under volatility uncertainty*, Stochastic Processes and their Applications 166.
- (5) Biagini, F., Mazzon, A., Oberpriller, K., (2023) *Reduced-form framework for multiple default times under model uncertainty*, Stochastic Processes and their Applications 156, 1 -43.
- (6) Biagini, F., Gonon, L., Reitsam, T., (2022) *Neural network approximation for superhedging prices*, Mathematical Finance 00, 1 - 39. <https://doi.org/10.1111/mafi.12363>.
- (7) Biagini, F., Reitsam, T., (2022) *Asset Price Bubbles in market models with proportional transaction costs* Frontiers of Mathematical Finance 1(3), 397 - 424.
- (8) Biagini, F., Zhang , Y. (2022) *Extended reduced-form framework for non-life insurance*, Advances in Applied Probability, 1-29, doi:10.1017/apr.2021.60.
- (9) Biagini, F., Reitsam, T., (2021) *A dynamic version of the super-replication theorem under proportional transaction costs*, Stochastic Analysis and Applications, 1- 22, DOI: 10.1080/07362994.2021.1990083.
- (10) Biagini, F., Oberpriller, K., (2021) *Reduced-form setting under model uncertainty with non-linear affine intensities*, Probability, Uncertainty and Quantitative Risk, 6 (3), 159-188.
- (11) Biagini F., Gnoatto A., Oliva I. (2021) *A unified approach to xVA with CSA discounting and initial margin*, SIAM J. Financial Math. 12(3), 1013-1053.

- (12) Biagini, F., Huber, T., Jaspersen, J.G., Mazzon, A. (2020) *Estimating Extreme Cancellation Rates in Life Insurance*, Journal of Risk and Insurance 88 (4), 971-1000.
- (13) Biagini, F. , Doldi, A. , Fouque, J.P. , Frittelli, M. , Meyer-Brandis, T. , (2020) *Systemic Optimal Risk Transfer Equilibrium*, Mathematics and Financial Economics 15, 233 - 274.
- (14) Biagini F., Gnoatto A. and Härtel M. (2020) *The long-term swap rate and a general analysis of long-term interest rates*, International Journal of Applied and Theoretical Finance, 23(1).
- (15) Biagini, F., Fouque, J.P., Frittelli, M., Meyer-Brandis, T. (2020) *On fairness of systemic risk measures*, Finance and Stochastics, 24, 513 - 564.
- (16) Biagini, F. , Zhang , Y. (2019) *Reduced-form framework under model uncertainty*, The Annals of Applied Probability, 29(4):2481-2522.
- (17) Biagini, F., Mazzon, A., Meyer-Brandis, T. (2019) *Financial asset bubbles in banking networks*, SIAM Journal on Financial Mathematics, 10(2), 430-465.
- (18) Biagini, F., Mancin, J., Meyer-Brandis, T. (2019) *Robust Mean-Variance Hedging via G-Expectation*, Stochastic Processes and their Applications, 129(4), 1287-1325.
- (19) Biagini, F., Fouque, J.P., Frittelli, M., Meyer-Brandis, T. (2019) *A unified approach to systemic risk measures via acceptance sets*, Mathematical Finance, 29 (1), 329-367.
- (20) Biagini F., Meyer-Brandis T., Øksendal B. and Paczka K. (2018) *Optimal control with delayed information flow of systems driven by G-Brownian motion*, Probability, Uncertainty and Quantitative Risk, 3(4).
- (21) Biagini, F., Mazzon, A., Meyer-Brandis, T. (2018) *Liquidity induced asset bubbles via flows of ELMMs*, SIAM Journal on Financial Mathematics 9 (2).
- (22) Biagini, F. and Mancin, J. (2017) *Financial Asset Bubbles under Uncertainty*, Probability, Uncertainty and Quantitative Risk 2 (14).
- (23) Biagini F., Botero C. and Schreiber I. (2017) *Risk-minimization for life insurance liabilities with dependent mortality risk*, Mathematical Finance 27 (2), 505 - 533.

- (24) Biagini, F. and Zhang, Y. (2016) *Polynomial Preserving Diffusion Models for Life Insurance Liabilities*, Insurance: Mathematics and Economics 71, 114 - 129.
- (25) Biagini F., Gnoatto A. and Härtel M. (2018) *Affine HJM framework on  $S_d^+$  and long-term yield*, Applied Mathematics and Optimization 77(3), 405-441.
- (26) Biagini F., Groll A. and Widenmann J. (2016) *Risk minimization for insurance products via F-doubly stochastic Markov chains*, Risks 4 (3), Article number 23.
- (27) Biagini F. , Rheinländer T. and Schreiber I. (2016) *Risk-minimization for life insurance liabilities with basis risk*, Mathematics and Financial Economics 10 (2), 151-178.
- (28) Biagini F. and Nedelcu S. (2015) *The formation of financial bubbles in defaultable markets*, SIAM Journal on Financial Mathematics 6 (1), 530-558.
- (29) Biagini F., Bregman Y., Meyer-Brandis T. (2015) *Electricity futures price modeling with Lévy term structure models*, International Journal of Theoretical and Applied Finance 18 (1).
- (30) Biagini F. and Härtel M. (2014) *Behaviour of Long-Term Yields in a Lévy Term Structure*, International Journal of Theoretical and Applied Finance 17 (3), 1 - 24.
- (31) Biagini F., Cretarola A. and Platen E. (2014) *Local risk minimization via benchmark approach*, Mathematics and Financial Economics 8 (2), 109-134.
- (32) Biagini F., Föllmer H. and Nedelcu S. (2014) *Shifting martingale measures and the slow birth of a bubble*, Finance and Stochastics 18 (2), 297-326.
- (33) Biagini, F., Groll, A. and Widenmann J. (2013) *Intensity based premium evaluation for unemployment insurance products*, Insurance: Mathematics and Economics 53, 302 - 316.
- (34) Biagini F., Fink H. and Klüppelberg C. (2013) *A fractional credit model with long range dependent default rate*, Stochastic Processes and their Applications 123, 1319 - 1347.
- (35) Biagini F. and Schreiber I. (2013) *Risk-minimization for life insurance liabilities*, SIAM Journal on Financial Mathematics 4, 243 - 264.

- (36) Biagini, F., Rheinländer T. and Widenmann J. (2013) *Hedging mortality claims with longevity bonds*, ASTIN Bulletin 43 (2), 123 - 157.
- (37) Biagini F. (2013) *Evaluating hybrid products: the interplay between financial and insurance markets*, in Stochastic analysis, random fields and applications VII. Progress in Probability 67, R. Dalang, M. Dozzi, F. Russo (Editors), Birkhäuser Verlag 2013.
- (38) Biagini F. and Widenmann J. (2012) *Pricing of unemployment insurance products with doubly stochastic Markov chains*, International Journal of Theoretical and Applied Finance 15 (4), 1 - 32.
- (39) Biagini F., Hu Y., Meyer-Brandis T. and Øksendal B. (2012) *Insider trading equilibrium in a market with memory*, Mathematics and Financial Economics 6 (3), 229 - 247.
- (40) Biagini F. and Cretarola A. (2012) *Local risk-minimization with recovery process*, Applied Mathematics and Optimization 65 (3), 293 - 314.
- (41) Biagini F., Fuschini S. and Klüppelberg C. (2011) *Credit contagion with long range dependent macroeconomic factor processes*, Advanced Mathematical Methods for Finance, Di Nunno G. and Øksendal B. editors, Springer.
- (42) Biagini F. and Cretarola A. (2009) *Local risk-minimization for defaultable markets*, Mathematical Finance 19, 669 - 689.
- (43) Biagini F. and Ulmer S. (2009) *Asymptotics for operational risk quantified with expected shortfall*, Astin Bulletin 39, 735 - 752.
- (44) Biagini F., Bregman Y. and Meyer-Brandis T. (2008) *Pricing of catastrophe insurance options under immediate loss reestimation*, Journal of Applied Probability 45, 831 - 845.
- (45) Biagini F., Bregman Y. and Meyer-Brandis T. (2008) *Pricing of catastrophe insurance options written on a loss index with reestimation*, Insurance: Mathematics and Economics 43, 214 - 232.
- (46) Biagini F. and Øksendal B. (2008) *Forward integrals and an Itô formula for fractional Brownian motion*, Infinite Dimensional Analysis, Quantum Probability and Related Topics 11, 157 - 177.
- (47) Biagini F., Campanino M. and Fuschini S. (2008) *Discrete approximations for stochastic integrals with respect to fractional Brownian motion with Hurst index  $H > 1/2$* , Stochastics 80, 407 - 426.

- (48) Biagini F. and Cretarola A. (2007) *Quadratic hedging methods for defaultable claims*, Applied Mathematics and Optimization 56, 425 - 443.
- (49) Biagini F. and Björk T. (2007) *On the Timing Option in a Futures Contract*, Mathematical Finance 17 (2), 267 - 283.
- (50) Biagini F. and Øksendal B. (2006) *Minimal Variance Hedging for Insider Trading*, International Journal of Theoretical and Applied Finance (IJTAF) 9, 1351 - 1375.
- (51) Biagini F. and Øksendal B. (2005) *A stochastic calculus approach to insider trading*, Applied Mathematics and Optimization 52, 167 - 181.
- (52) Biagini F., Øksendal B., Sulem A. and Wallner N. (2004) *An introduction to White noise theory and Malliavin calculus for fractional Brownian motion*, The Proceedings of the Royal Society, 460, 347 - 372.
- (53) Biagini F. and Øksendal B. (2003) *Minimal hedging for fractional Brownian motion*, Methods and Applications of Analysis 10, 347 - 362.
- (54) Biagini F., Hu Y., Øksendal B. and Sulem A. (2002) *A stochastic maximum principle for processes driven by fractional Brownian motion*, Stochastic Processes and their Applications 100, 233 - 253.
- (55) Biagini F. (2002) *Mean-Variance Hedging for Interest Rate Models with Stochastic Volatility*, Decisions in Economics and Finance 25, 1-17.
- (56) Biagini F. and Guasoni P. (2002) *Mean-Variance Hedging with Random Volatility Jumps*, Stochastic Analysis and Applications 20 (3), 471 - 494.
- (57) Biagini F. (2001) *A Quadratic Approach for Interest Rates Models in Incomplete Markets*, Proceedings of Workshop on Mathematical Finance, Konstanz, Germany, October 2000.
- (58) Biagini F., Guasoni P. and Pratelli M. (2000) *Mean-Variance Hedging for Stochastic Volatility Models*, Mathematical Finance 10 (2), 109 - 123.
- (59) Biagini F. and Pratelli M. (1999) *Local Risk Minimization and Numéraire*, Journal of Applied Probability 36 (4), 1 - 14.

### **BOOK CHAPTERS**

- (1) Biagini F., Meyer-Brandis T. and Svindland G. (2014) *The Mathematical Concept of Measuring Risk*, Risk - A Multidisciplinary Introduction, Klüppelberg C. , Straub D., and Welpel I.M. (Eds.), Springer.
- (2) Biagini F. and Rost D. (2010) *Money out of nothing? - Prinzipien und Grundlagen der Finanzmathematik*, Beiträege zum Mathematikunterricht 2010, Lindmeier, A. & Ufer, St. (Hrsg.), WTM-Verlag Münster, 41 - 48.
- (3) Biagini F. (2010) *The second fundamental asset pricing theorem*, Encyclopedia of Quantitative Finance, Cont R. (Ed.) John Wiley & Sons Ltd. Chichester, UK, 1623 - 1628.

### **BOOKS**

- (1) Biagini F. and Campanino M. (2016) *Elements of Probability and Statistics*, Introduction to Probability with the De Finetti's Approach and to Bayesian Statistics, Springer. English translation of the Italian version, see below.
- (2) Biagini F., Hu Y., Øksendal B., Zhang T. (2008) *Stochastic Calculus for Fractional Brownian Motion and applications*, Springer.
- (3) Biagini F. and Campanino M. (2005) *Elementi di Probabilità e Statistica*, Introduction to Probability and Statistics with solved exercises in Italian, Springer.

### **EDITORIAL ACTIVITY**

- (1) Biagini F. , Richter A., Schlesinger H. (Eds.), *Risk Measures and Attitudes*, EAA Series, Springer, 2012.
- (2) Biagini F. , Kauermann G., Meyer-Brandis T. (Eds.), *Network Science, An Aerial View*. Springer, 2019.

### **PhD THESIS**

*Quadratic Hedging Approaches For Interest Rate Models With Stochastic Volatility*, Tesi di Perfezionamento, Scuola Normale Superiore, 2001.

***PREPRINTS***

- (1) Biagini, F., Gonon, L., Mazzon, A., Meyer -Brandis, T., (2022) *Detecting asset price bubbles using deep learning*, Preprint LMU Munich.
- (2) Biagini, F., Doldi, A., Fouque, J.P., Frittelli, M., Meyer-Brandis, T., (2023) *Collective Arbitrage and the Value of Cooperation*, Preprint LMU Munich, University of Milano and University of California at Santa Barbara.
- (3) Biagini, F., Gonon, L., Walter, N. (2023) *Approximation Rates for Deep Calibration of (Rough) Stochastic Volatility Models*, Preprint LMU Munich and Imperial College London.