

# Curriculum Vitae Cosimo Munari (January 2024)

## Personal Information

Full Name	Cosimo-Andrea Munari
Nationality	Italian, Swiss
Birth Place	Codogno, Italy
Birth Date	23.01.1984
Email	<a href="mailto:cosimo.munari@univr.it">cosimo.munari@univr.it</a>

## Language Skills

Italian	Native
English	Proficient (C2)
German	Upper intermediate (B2)

## Education

2011–2015	<b>PhD in Mathematics</b> ETH Zurich, Switzerland Supervisors: Profs. Martin Schweizer and Walter Farkas Examiners: Profs. Damir Filipović and Alexander Schied
2010–2011	<b>Master in Finance</b> (A cum laude) Collegio Carlo Alberto, Turin, Italy
2007–2010	<b>Master in Mathematics</b> (110/110 cum laude) University of Milan, Italy
2004–2007	<b>Bachelor in Mathematics</b> (110/110 cum laude) University of Milan, Italy
2003–2004	<b>Student in Philosophy</b> University San Raffaele, Milan, Italy
1998–2003	<b>Diploma di Maturità Classica</b> (100/100 cum laude) Liceo Ginnasio M. Gioia, Piacenza, Italy

## Employment

2023–present	<b>Associate Professor</b> Department of Economics University of Verona, Italy
2023–2023	<b>Scientific Director</b> Center for Finance and Insurance University of Zurich, Switzerland
2017–2023	<b>Assistant Professor</b> Department of Banking and Finance University of Zurich, Switzerland
2017–2023	<b>Faculty Member</b> Swiss Finance Institute University of Zurich, Switzerland
2015–2017	<b>Postdoctoral Researcher</b> Department of Banking and Finance University of Zurich, Switzerland

## Awards

1. **National Scientific Habilitation (Full Professor).** Conferred by the Italian Minister of University and Research for the period 2023-2034 in the area Mathematical Methods of Economics, Finance, and Actuarial Sciences.

2. **National Scientific Habilitation (Associate Professor).** Conferred by the Italian Minister of University and Research for the period 2022-2033 in the area Mathematical Methods of Economics, Finance, and Actuarial Sciences.
3. **Wiley Top-Cited Article 2020-2021.** Awarded for the paper “Risk measures based on benchmark loss distributions” published in Journal of Risk and Insurance.
4. **CASF Best Paper Prize 2018.** Awarded for the presentation “Risk measures based on benchmark loss distributions” given at the 10th Conference in Actuarial Science and Finance on Samos.
5. **YITP Research Prize 2017.** Awarded by the Association of Italian Banking Foundations and Savings Banks within the Young Investigator Training Program to young researchers working in non-Italian institutions who attended the 18th Workshop on Quantitative Finance organized by the University of Milano Bicocca.
6. **Walter Sacher Prize 2016.** Awarded by the ETH Zurich Walter Sacher Association to outstanding PhD dissertations in the field of insurance.
7. **Carlo Alberto Prize 2010.** Full tuition fee waiver for the Master in Finance organized by Collegio Carlo Alberto in Turin and sponsored by Banca Intesa.

## Books

1. Koch-Medina, P., Munari, C.: Market-Consistent Prices: An Introduction to Arbitrage Theory, Springer Birkhäuser, 2020.

## Papers

1. Farkas, W., Koch-Medina, P., Munari, C.: Beyond cash-additive risk measures: When changing the numéraire fails, *Finance and Stochastics*, 18, 145-173, 2014.
2. Farkas, W., Koch-Medina, P., Munari, C.: Capital requirements with defaultable securities, *Insurance: Mathematics and Economics*, 55, 58-67, 2014.
3. Koch-Medina, P., Munari, C.: Law-invariant risk measures: Extension properties and qualitative robustness, *Statistics & Risk Modeling*, 31, 215-236, 2014.
4. Farkas, W., Koch-Medina, P., Munari, C.: Measuring risk with multiple eligible assets, *Mathematics and Financial Economics*, 9, 3-27, 2015.
5. Koch-Medina, P., Moreno-Bromberg, S., Munari, C.: Capital adequacy tests and limited liability of financial institutions, *Journal of Banking & Finance*, 51, 93-102, 2015.
6. Koch-Medina, P., Munari, C.: Unexpected shortfalls of Expected Shortfall: Extreme default profiles and regulatory arbitrage, *Journal of Banking & Finance*, 62, 141-151, 2016.
7. Koch-Medina, P., Munari, C., Šikić, M.: Diversification, protection of liability holders and regulatory arbitrage, *Mathematics and Financial Economics*, 11, 63-83, 2017.
8. Koch-Medina, P., Munari, C., Svindland G.: Which eligible assets are compatible with comonotonic capital requirements?, *Insurance: Mathematics and Economics*, 81, 18-26, 2018.
9. Gao, N., Leung, D., Munari, C., Xanthos, F.: Fatou property, representations, and extensions of law-invariant risk measures on general Orlicz spaces, *Finance and Stochastics*, 22, 395-415, 2018.
10. Koch-Medina, P., Munari, C., Šikić, M.: A simple characterization of tightness for convex solid sets of positive random variables, *Positivity*, 22, 1015-1022, 2018.

11. Baes, M., Koch-Medina, P., Munari, C.: Existence, uniqueness, and stability of optimal payoffs of eligible assets, *Mathematical Finance*, 30, 128-166, 2020.
12. Bignozzi, V., Burzoni, M., Munari, C.: Risk measures based on benchmark loss distributions, *Journal of Risk and Insurance*, 87, 437-475, 2020.
13. Baes, M., Munari, C.: A continuous selection for optimal portfolios under convex risk measures does not always exist, *Mathematical Methods of Operations Research*, 91, 5-23, 2020.
14. Gao, N., Munari, C.: Surplus-invariant risk measures, *Mathematics of Operations Research*, 45, 1342-1370, 2020.
15. Gao, N., Munari, C., Xanthos, F.: Stability properties of Haezendonck-Goovaerts premium principles, *Insurance: Mathematics and Economics*, 94, 94-99, 2020.
16. Arduca, M., Koch-Medina, P., Munari, C.: Dual representations for systemic risk measures based on acceptance sets, *Mathematics and Financial Economics*, 15, 155-184, 2021.
17. Munari, C.: Multi-utility representations of incomplete preferences induced by set-valued risk measures, *Finance and Stochastics*, 25, 77-99, 2021.
18. Bellini, F., Koch-Medina, P., Munari, C., Svindland, G.: Law-invariant functionals on general spaces of random variables, *SIAM Journal on Financial Mathematics*, 12, 318-341, 2021.
19. Bellini, F., Koch-Medina, P., Munari, C., Svindland, G.: Law-invariant functionals that collapse to the mean, *Insurance: Mathematics and Economics*, 98, 83-91, 2021.
20. Burzoni, M., Munari, C., Wang, R.: Adjusted Expected Shortfall, *Journal of Banking & Finance*, 134, 106297, 2022.
21. Liebrich, F.B., Munari, C.: Law-invariant functionals that collapse to the mean: Beyond convexity, *Mathematics and Financial Economics*, 16, 447-480, 2022.
22. Munari, C., Weber, S., Wilhelmy, L.: Capital requirements and claims recovery: A new perspective on solvency regulation, *Journal of Risk and Insurance*, 90, 329-380, 2023.
23. Arduca, M., Munari, C.: Fundamental theorem of asset pricing with acceptable risk in markets with frictions, *Finance and Stochastics*, 27, 831-862, 2023.
24. Koch-Medina, P., Munari, C.: Qualitative robustness of utility-based risk measures, *Annals of Operations Research*, to appear, 2023.
25. Herdegen, M., Munari, C.: An elementary proof of the dual representation of Expected Shortfall, *Mathematics and Financial Economics*, to appear, 2023.

## Working Papers

1. Arduca, M., Munari, C.: Risk measures beyond frictionless markets, submitted.
2. Amarante, M., Liebrich, F.-B., Munari, C.: Range convexity: Probabilities, risk measures, and games, submitted.
3. Munari, C., Plückebaum, J., Weber, S.: Robust portfolio selection under Recovery Average Value at Risk, submitted.
4. Bergesio, A., Koch-Medina, P., Munari, C.: Optimal demand for insurance under limited liability, submitted.
5. Amarante, M., Liebrich, F.-B., Munari, C.: A simple proof of the automatic Fatou property for law-invariant risk measures.

6. Koch-Medina, P., Munari, C., Svindland, G.: Pricing and exercising American options in a market-consistent way.
7. Herdegen, M., Khan, N., Munari, C.: On loss-sensitive risk measures.

## Grants

1. Junior member of the research group of Prof. W. Farkas, Department of Banking and Finance, University of Zurich. The group received financial support through the National Centre of Competence in Research grant NCCR FinRisk for the project “Financial Valuation and Risk Management”. The grant is acknowledged in reference 2 in the list of publications above.
2. Junior member of the research group of Prof. P. Koch-Medina, Department of Banking and Finance, University of Zurich. The group received financial support through the Swiss National Science Foundation grant 51NF40-144611 for the project “Capital Adequacy, Valuation, and Portfolio Selection for Insurance Companies”. The grant is acknowledged in references 1, 2, 3 and 4 in the list of publications above.
3. Awardee of the Young Investigator Training Program at the Quantitative Finance Workshop organized by the University of Milano Bicocca in January 2017. The prize was awarded by the Association of Italian Banking Foundations and Savings Banks and provided financial support for a research stay at the Department of Statistics and Quantitative Methods of the University of Milano Bicocca that is acknowledged in reference 12 in the list of publications above.
4. Senior member of the Center for Finance and Insurance, Department of Banking and Finance, University of Zurich. The center received financial support through the Swiss National Science Foundation grant 162613 for the project “The Valuation of Insurance Companies”. The grant is acknowledged in reference 11 in the list of publications above.
5. Senior member of the Center for Finance and Insurance, Department of Banking and Finance, University of Zurich. The center received financial support through the Swiss National Science Foundation grant 100018-189191 for the project “Value-maximizing Insurance Companies: An Empirical Analysis of the Cost of Capital and Investment Policies”. The grant is acknowledged in references 19 and 23 in the list of publications above.

## Conference Organization

1. Member of the local organizing committee of the conference Finance Meets Insurance, jointly organized by the University of Zurich, the Università della Svizzera Italiana, and the University of Geneva, and held in June 2019 at the Swiss Re Centre for Global Dialogue in Rueschlikon, Zurich, Switzerland.
2. Member of the organizing committee of the conference Set Optimization for Applications organized by Bilkent University and held in June 2022 in Ankara, Turkey.
3. Session organizer for the 32nd European Conference on Operations Research organized by Aalto University and held in July 2022 in Espoo, Finland.

## Talks

1. Multi-asset capital requirements, International Symposium of Mathematical Programming, TU Berlin, July 2012.
2. Risk measures and capital requirements with general reference assets, Risk Day, ETH Zurich, September 2012.

3. Risk measures and capital requirements with general reference assets, ETH Post/Doctoral Seminar in Mathematical Finance, ETH Zurich, September 2012.
4. Beyond cash-additive risk measures: capital efficiency and default risk (**invited talk**), Seminario de Análisis Funcional, University of Murcia, February 2013.
5. Measuring risk beyond the cash-additive paradigm, RiskLab PhD Seminar, ETH Zurich, May 2014.
6. What is a risk measure? (**invited talk**), Zurich Graduate Colloquium, Zurich, May 2014.
7. Problems and pitfalls of cash-additive risk measures, ETH Post/Doctoral Seminar in Mathematical Finance, ETH Zurich, May 2014.
8. Beyond cash-additive risk measures: when changing the numéraire fails, Bachelier Finance Society, World Congress, Brussels, June 2014.
9. Risk measures with multiple eligible assets, Set Optimization Meets Finance, Free University of Bozen-Bolzano, September 2014.
10. Do coherent risk measures take a liability holders' perspective?, Bachelier Finance Society, World Congress, New York, July 2016.
11. Diversification, protection of liability holders and regulatory arbitrage, 18th Workshop on Quantitative Finance, University of Milano Bicocca, January 2017.
12. The theory of capital adequacy tests, DiSMeQ Seminar, University of Milano Bicocca, February 2017.
13. The theory of capital requirements, DiSMeQ Seminar, University of Milano Bicocca, March 2017.
14. Challenging Expected Shortfall (**invited talk**), Colloquium of the Institute of Mathematical Statistics and Actuarial Science, University of Bern, April 2017.
15. Challenging Expected Shortfall (**invited talk**), Workshop on Financial Stability, Credit Risk and Default, TU Kaiserslautern, June 2017.
16. Fatou property, representations and extensions of law-invariant risk measures on general Orlicz spaces (**invited talk**), 1st Italian Meeting on Probability and Statistics, Politecnico di Torino, June 2017.
17. Comonotonic risk measures in a world without risk-free assets, Insurance: Mathematics and Economics Conference, TU Vienna, July 2017.
18. Do coherent risk measures take a liability holders' perspective?, Vienna Congress on Mathematical Finance, WU Vienna, September 2017.
19. Measures of financial risk: a review of the theory, Set Optimization for Applications, WU Vienna, September 2017.
20. Risk measures in mathematical finance (**invited talk**), Financial Mathematics Seminar, Ryerson University Toronto, November 2017.
21. Comonotonic risk measures in a world without risk-free assets (**invited talk**), Department Seminar on Statistics and Actuarial Science, University of Waterloo, November 2017.
22. Existence, uniqueness and stability of optimal portfolios of eligible assets, 19th Workshop on Quantitative Finance, University of Roma Tre, January 2018.
23. Surplus-invariant risk measures (**invited talk**), Model Uncertainty and Robust Finance, University of Milan, March 2018.

24. Existence, uniqueness and stability of optimal portfolios of eligible assets (**invited talk**), Research Seminar of the Institute for Statistics and Mathematics, WU Vienna, March 2018.
25. Risk measures based on benchmark loss distributions, 10th Conference in Actuarial Science and Finance on Samos, University of the Aegean, June 2018.
26. Existence, uniqueness and stability of optimal portfolios of eligible assets (**invited talk**), Stochastic Finance Seminar, University of Warwick, June 2018.
27. Benchmark loss distributions in insurance regulation (**invited talk**), 29th European Conference on Operations Research, Valencia, July 2018.
28. Robust portfolio selection under regulatory constraints (**invited talk**), Workshop on New Frontier Areas in Financial Analytics, Fields Institute Toronto, May 2019.
29. Risk measures based on benchmark loss distributions, Insurance: Mathematics and Economics Conference, TU Munich, July 2019.
30. How natural are law-invariant pricing rules? (**invited talk**), Annual Meeting of the Association of Swiss Actuaries, Lucerne, August 2019.
31. Robust portfolio selection under regulatory constraints, Vienna Congress on Mathematical Finance, WU Vienna, September 2019.
32. Duality for risk functionals on Orlicz spaces (**invited talk**), Dynamics, Equations and Applications, University of Krakow, September 2019.
33. Law-invariant functionals beyond bounded positions, 21st Workshop on Quantitative Finance, University of Napoli Parthenope, January 2020.
34. Solvency capital requirements and recovery of liabilities (**invited talk**), New Challenges in the Interplay between Finance and Insurance, Oberwolfach Virtual Meeting October 2020.
35. Multi-utility representations of incomplete preferences induced by set-valued risk measures (**invited talk**), Learning Tools and Applied Quantitative Methods for Decision Making, Free University of Bozen-Bolzano, December 2020.
36. Capital requirements and claims recovery: A new perspective on solvency regulation (**invited talk**), Virtual Seminar in Insubria & Bicocca, May 2021.
37. Capital requirements and claims recovery: A new perspective on solvency regulation, Insurance: Mathematics and Economics Conference, July 2021.
38. Fundamental theorem of asset pricing with acceptable risk in markets with frictions (**invited talk**), Mathematical Finance Seminar, University of Bielefeld, May 2022.
39. The limitations of law invariance (**invited talk**), 3rd Italian Meeting on Probability and Statistics, University of Bologna, June 2022.
40. Fundamental theorem of asset pricing with acceptable risk in markets with frictions (**invited talk**), Stochastic Finance Seminar, University of Warwick, June 2022.
41. Market-consistent pricing with acceptable risk (**invited talk**), De Finetti Risk Seminar, University of Milan, November 2022.
42. Capital requirements and claims recovery (**invited talk**), Verona Workshop in Financial Mathematics, University of Verona, December 2022.
43. Market-consistent pricing with acceptable risk (**invited talk**), Oberseminar Finanz- und Versicherungsmathematik, LMU Munich, February 2023.

44. Fundamental theorem of asset pricing with acceptable risk in markets with frictions (**invited talk**), 4th Spring Colloquium on Probability and Finance, University of Padova, April 2023
45. Fundamental theorem of asset pricing with acceptable risk in markets with frictions (**invited talk**), Workshop: Risk Measures and Uncertainty in Insurance, Leibnizhaus, Hannover, May 2023.
46. Capital requirements and claims recovery (**invited talk**), XLVII Annual Meeting of the Italian Association for Mathematics Applied to Social and Economic Sciences, University of Milano Bicocca, September 2023.
47. Fundamental theorem of asset pricing with acceptable risk in markets with frictions (**invited talk**), Workshop on New Challenges in the Interplay between Finance and Insurance, Oberwolfach Mathematical Institute, October 2023.

### Peer-Review Service

Mathematical Finance, Finance and Stochastics, Mathematics and Financial Economics, SIAM Journal on Financial Mathematics, Quantitative Finance, Insurance: Mathematics and Economics, Journal of Risk and Insurance, ASTIN Bulletin, European Journal of Actuarial Science, Management Science, Journal of Banking and Finance, Mathematics of Operations Research, Operations Research, Annals of Operations Research.

### Supervision (PhD Students)

1. Arduca Maria: Risk measures in markets with frictions, PhD in Statistics and Mathematical Finance, University of Milano Bicocca, 2021.
2. Bergesio Andrea: Frictional costs in insurance, PhD in Finance, University of Zurich, 2022.

### Supervision (Master Students)

1. Annoni David: The impact of climate risk on the behavior of insurance stocks, Master in Banking and Finance, University of Zurich, 2022.
2. Benetazzo Greta: Comparative analysis of predictive models: Backtest using the Basel traffic light approach, Master in Banking and Finance, University of Zurich, 2023.
3. Bogdanova Mariia: The replicating portfolio approach in market-consistent valuation, Master in Banking and Finance, University of Zurich, 2021.
4. Bordogna Giada: No-arbitrage conditions on general topological spaces, Master in Mathematics, ETH Zurich, 2013 (with W. Farkas).
5. Brambilla Fabio: Expectiles as market risk measures: Estimation and sensitivity analysis, Master in Business and Economics, University of Zurich, 2019.
6. Cao Xin: Value at Risk in portfolio selection, Master in Economics and Business Administration, University of Zurich, 2019.
7. Carvalho Bica Daniel: Portfolio optimization under Value at Risk and Expected Shortfall constraints, Master in Banking and Finance, University of Zurich, 2023.
8. Cassani Nicola: Optimal investment strategies for insurance firms under regulatory constraints, Master in Banking and Finance, University of Zurich, 2022.
9. Chen Yu: Callable bonds in internal models for insurers: Pricing and hedging, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2018 (with P. Middelkamp).

10. Cottet Thibault: Pricing of European, American, and Asian options: A review of derivative pricing, Master in Banking and Finance, University of Zurich, 2023.
11. Destani Urime: Evaluation of the square-root-of-time rule for estimating Value at Risk and Expected Shortfall, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2023.
12. Dinh Inés: Gender as a risk factor in the calculation of insurance premiums and benefits, Master in Management and Economics, University of Zurich, 2018.
13. Eccher James: Pricing of derivative instruments: A comparison between plain vanilla and exotic options, Master in Banking and Finance, University of Zurich, 2023.
14. Enders Tobias: Risk measures and tail risk, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2017 (with P. Koch-Medina).
15. Gadient Alain: A study on the impact of transaction costs on capital requirements, Master in Banking and Finance, University of Zurich, 2023.
16. Gadoury Simon-Pierre: Performance analysis and comparison of portfolio immunization strategies, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2020.
17. Geiges Angela: On the accuracy of time scaling of risk, Master in Banking and Finance, University of Zurich, 2022.
18. Gilli Dominique: Option pricing by Monte Carlo simulation, Master in Banking and Finance, University of Zurich, 2021.
19. Hauser Samir: An empirical analysis of the the impact of MiFID II tick size rules on stock trading, Master in Banking and Finance, University of Zurich, 2022.
20. Henriques Pereira Marco: Monte Carlo simulation and its applications to finance, Master in Business Administration, University of Zurich, 2021.
21. Huber Valentine: Market-consistent valuation of CAT bonds, Master in Economics, University of Zurich, 2021.
22. Jakob Raphael: Market-consistent valuation and insurance premia, Master in Banking and Finance, University of Zurich, 2018.
23. Keller Raphael: Capital requirements and claims recovery: A numerical analysis, Master in Banking and Finance, University of Zurich, 2022.
24. Li Tianzhang: Measuring the risk level of Chinese and Japanese stock markets with Value at Risk, Master in Banking and Finance, University of Zurich, 2021.
25. Li Xian: Backtesting Expected Shortfall with multinomial Value at Risk tests, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2020.
26. Lin Yanpei: An empirical study of Loss Value at Risk with applications to portfolio risk management and catastrophic risk, Master in Banking and Finance, University of Zurich, 2020.
27. Liu Huanyu: Efficient investment strategies for private equity firms in the Chinese internet market, Master in Banking and Finance, University of Zurich, 2022.
28. Lyson Antoine: Law-invariant risk measures, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2015 (with W. Farkas).
29. Marin Salazar Juan Pablo: Insurance linked securities, Master in Business and Economics, University of Zurich, 2018.

30. Marossy Zita: Frequency analysis for detection of financial market cycles in risk factor models, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2020.
31. Moser Manuel: Estimation and backtesting techniques for measures of risk, Master in Banking and Finance, University of Zurich, 2021.
32. Mueller Markus Sven: Backtesting forecasting methods of Value at Risk and Expected Shortfall, Master in Banking and Finance, University of Zurich, 2019.
33. Muller Stefanie: Risk measures on Orlicz spaces, Master in Mathematics, ETH Zurich, 2012 (with W. Farkas).
34. Panorov Borislav: A comparative study of demand drivers for life insurance in Western and Eastern Europe, Master in Banking and Finance, University of Zurich, 2018.
35. Peng Zhe: Technical pricing for motorcycle insurance portfolios, Master in Business and Economics, University of Zurich, 2020.
36. Qu Yannong: Risk estimation based on extreme value theory, Master in Banking and Finance, University of Zurich, 2020.
37. Residori Alberto: Pricing CAT bonds using extreme value theory, Master in Banking and Finance, University of Zurich, 2019.
38. Rizzo Mariangela: Risk measures in market models with transaction costs, Master in Mathematical Engineering, Politecnico of Milan, 2013 (with C. Sgarra).
39. Schaub Dominic: Comparative performance of quantile-based risk measures vs Value at Risk and Expected Shortfall, Master in Banking and Finance, University of Zurich, 2019.
40. Schenk Nathalie: Stability properties of risk measures, Master in Mathematics, ETH Zurich, 2013 (with W. Farkas).
41. Shen Meichen: Tail risk estimation: A comparative analysis across asset classes and geographical regions, Master in Banking and Finance, University of Zurich, 2022.
42. Siocchos Alkis: Conditional estimation of risk measures: A comparative analysis across asset classes, Master in Banking and Finance, University of Zurich, 2022.
43. Trovato Luca: Law-invariant risk measures, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2013 (with W. Farkas).
44. Várkonyi Ádám Szolt: The impact of solvency regulation on the investment behavior of financial institutions, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2021.
45. Xu Qingyang: Estimation and backtesting of Loss Value at Risk, Master in Banking and Finance, University of Zurich, 2021.
46. Yansong Yu: Risk measure estimation over long time horizons, Master in Banking and Finance, University of Zurich, 2021.
47. Zhang Fang: Estimating and backtesting risk measures, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2019.
48. Zhao Jiaxuan: Estimation of Value at Risk in conditional models, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2020.
49. Zhou Jiani: Risk and return replication of trend following strategies, Master in Quantitative Finance, University of Zurich and ETH Zurich, 2019 (with M. Wunsch).

### **Supervision (Bachelor Students)**

1. Hartog Jarno: Value-at-Risk and Tail Value-at-Risk: A comparison study, Semester Work, ETH Zurich, 2012 (with W. Farkas).
2. Notaro Alberto: Computing Value at Risk on long time horizons: Is the square-root rule an appropriate method?, Bachelor in Banking and Finance, University of Zurich, 2021.
3. Poole Roman: Catastrophe bonds: A comprehensive analysis, Bachelor in Banking and Finance, University of Zurich, 2020.
4. Svaluto-Ferro Sara: Risk measures and capital requirements, Bachelor in Mathematics, ETH Zurich, 2012 (with W. Farkas).
5. Villard Alexandre: A short note on indifference pricing, Semester Work, ETH Zurich, 2013 (with W. Farkas).
6. Weber Maurice: VaR and AVaR based capital requirements with defaultable securities, Bachelor in Mathematics, ETH Zurich, 2015 (with W. Farkas).
7. Zöchbauer Patrick: Analysis of convex risk measures on  $L^1$ , Bachelor in Mathematics, ETH Zurich, 2014 (with W. Farkas).