*MEMOTEF – Metodi e Modelli per l'Economia, il Territorio e la Finanza*
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*00161, Roma, Italy*
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✉ *immacolata.oliva@uniroma1.it*

# Immacolata Oliva

*Curriculum Vitae*

## General Information

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|---|---|
| name | Immacolata |
| surname | Oliva |
| place and date of birth | Potenza (Italy), 28 September 1982 |
| citizeship | Italian |

## Education

2005 – 2008 **Undergraduate student of Mathematics at the University of Basilicata (Italy)**.
Title of the dissertation: *Un approccio algebrico-combinatorio alla teoria delle variabili aleatorie di Poisson*.
Advisors: Prof. D. Senato (University of Basilicata), Prof. Elvira di Nardo (University of Turin)
The thesis was defended on March 2008.

2009 – 2012 **Ph.D. student in Mathematics at the Department of Mathematics of the University of Bologna (Italy)** .
Title of the dissertation: *A moment symbolic representation of Lévy processes with applications.*
Advisors: Prof. Elvira di Nardo (University of Turin), Prof. Marilena Barnabei (University of Bologna)
The thesis was defended on June 2012.

10/2011 – 03/2012 **Corso di Alta Formazione in Finanza Matematica at the Department of Mathematics of the University of Bologna (Italy)**.

## Current Position

03/2022 – present **Associate professor at MEMOTEF – Sapienza University of Rome, Rome (Italy)**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE

03/2019 – present **Member of P.h.D. Scientific Board**.
Member of the P.h.D. *Models for Economics and Finance* Scientific Board, Sapienza University of Rome

04/2021 **National Scientific Qualification – Associate Professor**.
National Scientific Qualification (ASN - "Abilitazione Scientifica Nazionale") to function as Associate Professor in Italian Universities (SSC 13/D4, SSD Secs/S-06 Mathematical methods for economics and financial and actuarial sciences)

## Past Academic Positions

07/2012 – 06/2013 **Post-doctoral fellow at the Department of Economics of the University of Verona (Italy)**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE
Research project: Evaluation of derivatives by using stochastic discount factor.
Duration: one year.
Advisor: Dr. Silvia Centanni (University of Verona)

02/2014 – 06/2014 **Adjunct professor**.
Adjunct professor at the Department of Mathematics, Computer Sciences and Economics of the University of Basilicata.

07/2014 – 06/2015 **Post-doctoral fellow at the Department of Computer Sciences of the University of Verona (Italy)**.
SSD: MAT/06 – PROBABILITA' E STATISTICA MATEMATICA
Research project: "Stochastic differential equations with jumps in Mathematical Finance: applications to pricing, hedging and dynamic risk measure's problems"
Duration: one year.
Advisor: Dr. Luca Di Persio (University of Verona)

03/2015 – 06/2015 **Adjunct professor**.
Adjunct professor at the Department of Computer Sciences of the University of Verona

09/2015 – 06/2018 **Post-doctoral fellow at the Department of Economics of the University of Verona (Italy).**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE
Research project: "Facing credit risk: a mathematical approach to risk measures and their management "
Duration: three years.

07/2018 – 12/2018 **Post-doctoral fellow at the Department of Economics and Management (DISEI) of the University of Florence (Italy).**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE
Research project: "Risk measures with High frequency data "
Duration: one year.
Advisor: Prof.ssa Maria Elvira Mancino (University of Florence)

12/2018 – 02/2019 **Assistant professor (RTD A) at Department of Management – Università Politecnica delle Marche, Ancona (Italy)**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE

03/2019 – 02/2022 **Assistant professor (RTD B) at MEMOTEF – Sapienza University of Rome, Rome (Italy)**.
SSD: SECS-S/06 – METODI MATEMATICI DELL'ECONOMIA E DELLE SCIENZE ATTUARIALI E FINANZIARIE

## Visiting Positions

04/2018 – 06/2018 **Visiting researcher**.
Visiting researcher at the Department of Mathematics of the Ludwig-Maximilians-Universitat (Munich, Germany). Advisor: Prof. Dr. Francesca Biagini.

09/2018 **Visiting researcher**.
Visiting researcher at the Department of Mathematics of the Ludwig-Maximilians-Universitat (Munich, Germany).

## Other Appointments

01/2012 – 12/2013 **Free-lance partner for a financial mathematics website.**.
Free-lance partner for scientificahiring.com in order to create open-ended and/or multiple–choice tests, for the self-evaluation of Financial Industry and Investment Banking knowledges

05/2012 – 06/2012 **Substitute teacher at High school**.
Mathematics and physics substitute teacher at "IIS Maria Montessori - Leonardo da Vinci", Porretta Terme (Italy)

09/2013 – 02/2014 **Substitute teacher at High school**.
Computer sciences substitute teacher at "IIS Maria Montessori - Leonardo da Vinci", Porretta Terme (Italy)

## Teaching experience

a.a. 2013/2014 Statistics - Bachelor's degree in Business Administration (10 ECT)

a.a. 2013/2014 Probability - Bachelor's degree in Mathematics (7 ECT)

a.a. 2014/2015 Probability and Statistics - Bachelor's degree in Computer Sciences (4 ECT)

a.a. 2014/2015 Probability - Bachelor's degree in Applied Mathematics (1 ECT)

a.a. 2015/2016 Computational Methods in Finance - Master's degree in Banking and Finance (4 ECT)

a.a. 2016/2017 Computational Methods in Finance - Master's degree in Banking and Finance (6 ECT)

a.a. 2017/2018 Computational Methods in Finance - Master's degree in Banking and Finance (6 ECT)

a.a. 2018/2019 Methods and Models in Finance - Master's degree in Finance and Insurance (9 ECT)

a.a. 2019/2020 Methods and Models in Finance - Master's degree in Finance and Insurance (6 ECT)

a.a. 2019/2020 Quantitative Finance - Master's degree in Finance and Insurance (6 ECT)

a.a. 2020/2021 Methods and Models in Finance - Master's degree in Finance and Insurance (9 ECT)

a.a. 2020/2021 Quantitative Finance - Master's degree in Finance and Insurance (6 ECT)

a.a. 2021/2022 Methods and Models in Finance - Master's degree in Finance and Insurance (9 ECT)

a.a. 2021/2022 Quantitative Finance - Master's degree in Finance and Insurance (6 ECT)

a.a. 2022/2023 Methods and Models in Finance - Master's degree in Finance and Insurance (9 ECT)

a.a. 2022/2023 Quantitative Finance - Master's degree in Finance and Insurance (9 ECT)

P.h.D. 35th cycle Computational tools for Finance – P.h.D. Course on Models for Economics and Finance (15 hours)

P.h.D. 36th cycle Computational tools for Finance – P.h.D. Course on Models for Economics and Finance (15 hours)

P.h.D. 37th cycle Computational tools for Finance – P.h.D. Course on Models for Economics and Finance (15 hours)

P.h.D. 38th cycle Computational tools for Finance – P.h.D. Course on Models for Economics and Finance (15 hours)

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|---|---|
| a.a. 2015/2016 | Supervision of Bachelor's degree theses |
| a.a. 2016/2017 | Supervision of Master's degree theses |
| a.a. 2017/2018 | Supervision of Master's degree theses |
| a.a. 2018/2019 | Supervision of Master's degree theses |
| a.a. 2019/2020 | Supervision of Master's degree theses |
| a.a. 2020/2021 | Supervision of Master's degree theses |
| a.a. 2021/2022 | Supervision of Master's degree theses |
| a.a. 2022/2023 | Supervision of Master's degree theses |

## Grants

Research grant **Cooperint 2017**.
Research scholarship (4000 €) for visiting scholars at Department of Mathematics – LMU Munich (April–June 2018)

Grant **INDAM**.
Grant INDAM (Italian Institute of High Mathematics) financial support award for the participation to the ICNAAM 2011 Conference, Halkidiki (Greece), 19–25 September 2011

## Funding Information

Progetto di Ateneo 2022 — Principal Investigator to the research project *Frictions meet incompleteness: no-arbitrage solutions for derivative pricing and investment opportunities,* Progetto di Ateneo 2022 Sapienza Università di Roma ). Financed amount: 10000 €

Progetto di Ateneo 2022 - avvio alla ricerca — Participation as Reference tutor (Co-investigator) to the research project *Dynamic optimal portfolio allocation.* Principal Investigator: Ilaria Stefani (Sapienza University of Rome), Progetto di Ateneo 2022 per avvio alla ricerca, Sapienza Università di Roma . Financed amount: 1200 €

Progetto di Ateneo 2021 — Principal Investigator to the research project *Facing emerging risks: an actuarial perspective,* Progetto di Ateneo 2021 Sapienza Università di Roma ). Financed amount: 12000 €

Progetto di Ateneo 2020 — Principal Investigator to the research project *Actuarial and financial risk management solutions in a pandemic mortality framework,* Progetto di Ateneo 2020 Sapienza Università di Roma ). Financed amount: 10000 €

GNAMPA 2020 — Participation as Investigator to GNAMPA 2020 research project *Una classe di problemi di ottimizzazione in ambito attuariale ed economico.* Principal Investigator: Prof.ssa Claudia Ceci (University of Chieti-Pescara "G. d'Annunzio"). Financed amount: 2250 €

Progetto di Ateneo 2019 — Participation as Investigator to the research project *Life market: a renewal boost for quantitative management of longevity and lapse risks,* Progetto di Ateneo 2020 Sapienza Università di Roma. Principal Investigator: Prof.Gabriele Stabile (Sapienza Sapienza Università di Roma). Financed amount: 10000 €

GNAMPA 2018 — Participation as Investigator to GNAMPA 2018 research project *Nuovi indicatori di instabilità dei mercati finanziari.* Principal Investigator: Prof.ssa Cecilia Mancini (University of Florence). Financed amount: 3000 €

Prin 2017 — Participation as Investigator to Prin 2017 research project *HiDEA: Advanced Econometrics for High-frequency Data.* Principal Investigator: Prof. Roberto Renò (University of Verona). Financed amount: 409940 €

Prin 2015 — Participation as Investigator to Prin 2015 research project *Quantitative Methods for Financial Stability.* Principal Investigator: Prof. Roberto Renò (University of Verona)

## Society memberships

| | |
|---|---|
| 2013–present | Member of INDAM–GNAMPA Reasearch group |
| 2010–2012 | Member of INDAM–GNSAGA Reasearch group |
| 2014–present | Member of AMASES |
| 2018 | Member of The Risk, Banking and Finance Society |

## Language skills

| | |
|---|---|
| Italian | mother tongue |
| English | Fluent spoken and written English |
| French | Basic spoken and written French |
| Spanish | Basic spoken and written Spanish |

## Informatic skills

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| OS: | Windows 2007, XP: Windows 2.0 - 98; Unix System V |
| Program Languages: | VBA |
| Database: | SQL |
| Software packages: | Matlab, Mathematica, Maple |
| Application software: | Microsoft Word, Excel, PowerPoint, Outlook |

## Research

Research Interests **Symbolic methods and stochastic processes**.
Main topics include:

- Lévy processes
- Umbral calculus
- Time-space harmonic polynomials

**Mathematical finance**.
Main topics include:

- Prediction and filtering
- Monte Carlo methods
- Pricing and hedging
- Counterparty credit risk
- Portfolio optimization

**Probability theory and stochastic processes**.
Main topics include:

- Stochastic differential equations driven by Lévy processes
- Mathematical models applied in Economics

## Publications

Di Nardo E., Oliva I. (2009) *On the computation of classical, boolean and free cumulants.* Appl. Math. Comp., Vol. 208 (2), 347-354, doi: 10.1016/j.amc.2008.11.047, ISSN: 0096-3003.

Di Nardo E., Oliva I. (2011) *On a symbolic version of multivariate Lévy processes.* AIP Conf. Proc. - Vol. 1389, 345-348, doi:10.1063/1.363673 - ISBN: 978-0-7354-0956-9.

Di Nardo E., Oliva I. (2012) *On some applications of a symbolic representation of non-centered Lévy processes.* Comm. Statist. Theory Methods, Vol. 42 (21), 3974-3988, doi:10.1080/03610926.2011.642920, ISSN: 0361-0926.

Di Nardo E., Oliva I. (2012) *A new family of time-space harmonic polynomials with respect to Lévy processes.* Ann. Mat. Pura Appl., Vol. 192 (5), 917-929, doi:10.1007/s10231-012-0252-3, Print ISSN: 0373-3114, Online ISSN: 1618-1891.

Di Nardo E., Oliva I. (2012) *Multivariate Bernoulli and Euler polynomials via Lévy processes.* Appl. Math. Letters, Vol. 25 (9), 1179-1184, doi:10.1016/j.aml-2012-02-033, ISSN: 0893-9659.

Oliva, I. (2012) *Oliva, I. (2012) A moment symbolic representation of Lèvy processes with applications,* PhD thesis.

Di Nardo E., Oliva I. (2013) *Multivariate time-space harmonic polynomials: a symbolic approach*. Mathematical Methods in Economics and Finance - ISSN (print edition): 1971-6419, in press, http://arxiv.org/pdf/1310.4254.pdf.

Oliva I. (2013) *Una rappresentazione simbolica via momenti dei processi di Lèvy ed applicazioni.* Matematica nella Società e nella Cultura, Vol. 6(3), 521–524

Di Persio L., Oliva, I. (2015) *An interval of no-arbitrage prices for American contingent claims in incomplete markets*. International Journal of Pure and Applied Mathematics Vol. 103(1), 133–153

Bonollo M., Di Persio L., Mammi L., Oliva, I. (2016) *Counterparty Credit Risk Evaluation for Accumulator Derivatives: the Brownian Local Time Approach.* Economics and Management Systems Vol. 1, 188–191

Centanni S., Oliva I., Tardelli, P. (2016) *Credit Risk in an Economy with New Firms Arrivals.* Methodol Comput Appl Probab 19(891).

Bonollo M., Di Persio L., Mammi L., Oliva, I. (2017) *Estimating the Counterparty Risk Exposure by using the Brownian motion local time.* International Journal of Applied Mathematics and Computer Science (AMCS) 27(2)

Cordoni F., Di Persio L., Oliva, I. (2017) *A nonlinear Kolmogorov equation for stochastic functional delay differential equations with jumps*. Nonlinear Differential Equations and Applications, Nonlinear Differ. Equ. Appl. 24(16).

Oliva I., Renò R. (2018) *Optimal portfolio allocation with volatility and co-jump risk that Markowitz would like,* J. Econ. Dyn. Control, **94**, 242–256.

De angelis P., De Marchis R., Martire A.L., Oliva I. (2020) *A Mean-Value approach to solve fractional differential and integral equations,* Chaos Soliton. Fract., 138, 109895, https://doi.org/10.1016/j.chaos.2020.109895

Di Persio L., Oliva I., Wallbaum K. (2020) *Options on Constant Proportion Portfolio Insurance with guaranteed minimum equity exposure,* Appl. Stoch. Model. Bus., forthcoming, doi: 10.1002/ASMB.2547

Bonollo M., Di Persio L., Oliva, I. (2018) *A Quantization Approach to the Credit Exposure Estimation,* International Review of Economics and Finance, http://dx.doi.org/10.1016/j.iref.2020.08.005

De angelis P., De Marchis R., Marino M., Martire A.L., Oliva I.(2021) *Betting on Bitcoin: a profitable trading between directional strategies and Deep Learning,* Decisions in Economic and Finance, DOI:10.1007/s10203-021-00324-z

Biagini F., Gnoatto A., Oliva I. (2021) *A Unified Approach to xVA with CSA Discounting and Initial Margin,* SIAM Journal of Financial Mathematics, https://doi.org/10.1137/20M1332153w

De Angelis P., De Marchis R., Marino M., Martire A.L., Oliva I. (2021) *Evaluating ruin probabilities: a streamlined approach,* Applied Mathematics E-Notes, 21(2021), 634–642

Martire A.L., Oliva I. (2022) *A numerical method for multidimensional Volterra integral equations,* Applied Mathematical Sciences, 16(12), 709–717

Oliva I., Stefani I. (2023) *Co-jumps and recursive preferences in portfolio choices,* Annals of Finance, https://doi.org/10.1007/s10436-023-00425-2, 634–642

## Papers submitted to peer-reviewed journals

Di Persio L., Mancinelli D., Oliva I., Wallbaum K. (2022) *Option pricing and time-invariant portfolio strategies,* under review

Oliva I., Stefani I., Torricelli, L. (2023) *Dynamic portfolio allocation in complete markets with co-jumps,* under review

Mancinelli D., Oliva I., (2023) *Constant or variable? A performance analysis among portfolio insurance strategies,* under review

## Work in progress

*Optimal multi-license oil concessionaires valuation,* with M. Ventura

*Pension fund with longevity risk: an optimal portfolio insurance approach,* with M. Di Giacinto, D. Mancinelli, M. Marino

*Optimal design of a new class of Proportion Portfolio Insurance strategy in a jump-diffusion framework,* with K. Colaneri, D. Mancinelli

*Robust optimal portfolio choices with derivatives and jumps,* with I. Stefani

## Conference proceedings

Di Nardo E., Oliva I. (2011) *Umbral calculus and Lévy processes*. ASMDA11. Contributed paper.

Centanni S., Minozzo M., Oliva I. (2013) *Filtering, smoothing and estimation for a class of marked doubly stochastic Poisson processes* ICSMS 2012 Conf. Proc. – ISBN : 978-81-925286-4-9.

## Journal services

Editorial board member for the Journal *Annali del Dipartimento di Metodi e modelli per l'economia, il territorio e la finanza*

Editorial board member (Review Editor) for the Journal *Frontiers in Applied Mathematics and Statistics - Mathematical Finance*

Co-Guest Editor of Special Issue *New Challenges in Mathematical Finance: From S(P)DEs to Machine Learning*, Risks Journal

Referee for (among others): Decisions in Economics and Finance, European Journal of Operational Research, International Journal of Financial Studies, Journal of Forecasting, Journal of Risk, Quantitative Finance, Risks

## Conference and Seminar Presentations

*XXIV Quantitative Finance Workshop (QFW 2023)*, University of Cassino and Southern Lazio, Gaeta (LT) (Italy), 20–22 April 2023

*32nd European Conference on Operational Research (EURO 2022)*, Aalto University, Espoo (Finland), 3–6 July 2022

*Spring Workshop in Stochastics and Finance*, LMU Munich, 5 May 2022 (Invited speaker)

*Grape Meeting*, CNR Roma, 29 April 2022 (Invited speaker)

*International Conference on Data Analytics for Business and Industry (DATA21)*, Online, 25-26 October 2021 (Invited speaker - special session *Statistical and Financial Modeling*)

*XLV Annual Meeting of the Italian Association for Mathematics Applied to Economic and Social Sciences (AMASES)*, Online, 13-18 September 2021 (Invited speaker - special session *Stochastic Methods in Finance and Insurance*)

*XXIV Conference IME 2021*, Online, 5-9 July 2021

*XXI Workshop on Quantitative Finance*, Parthenope University, Napoli, 29-31 January 2020

*43nd Annual Meeting of the Italian Association for Mathematics Applied to Economic and Social Sciences (AMASES)*, Perugia, 9-11 September 2018

*XX Workshop on Quantitative Finance*, ETH Zürich, 23-25 January 2019

*42nd Annual Meeting of the Italian Association for Mathematics Applied to Economic and Social Sciences (AMASES)*, Napoli, 13-15 September 2018

*10th World Congress Bachelier Finance Society*, Dublin, 16-20 July 2018

*IRMC2018*, Paris, 7-8 June 2018

*XIX Workshop on Quantitative Finance*, Rome, 24-26 January 2018

*4th Finance Scholars Conference*, University of Sussex–Brighton, 12-13 June 2017

*XVIII Workshop on Quantitative Finance*, Milan, 25-27 January 2017

*Siena Finance Workshop*, Siena, 30 September 2016

*XVII Workshop on Quantitative Finance* – Poster Session, Pisa, 28-29 January 2016

45th Annual Conference of the Italian Operations Research Society, Pisa, 7-10 September 2015

39th Annual Meeting of the Italian Association for Mathematics Applied to Economic and Social Sciences (AMASES) Padua, 10-12 September 2015

Afternoon on Control, Stochastic processes and Financial Mathematics, Povo, 10 March 2015

*XVI Workshop on Quantitative Finance* – Poster Session, Parma, 29-30 January 2015

Workshop *Dependence in Risk Measurement and Risk Management*, Florence, 18-19 December 2014

Workshop *Recent Advances in Mathematical Finance*, Padua, 20 September 2014

MAF 2014, Vietri sul mare (Italy), 22-24 April 2014

XVIII Incontro Italiano di Combinatoria Algebrica, Matera (Italy), 10-12 September 2012

MAF 2012, Venice (Italy), 10-12 April 2012

ICNAAM 2011, Halkidiki (Greece), 19-25 September 2011

ASMDA 2011, Rome, (Italy) 7-10 June 2011

Young Women in Probability, Bonn, (Germany) 19-21 May 2011

Notte dei Ricercatori in Emilia Romagna, Bologna, (Italy) 24 September 2010

## Conferences and Workshops attended

*Online International Conference in Actuarial science, data science and finance (OICA)*, organized by Lyon University, 28-29 April 2020

Winter School *Frontiers in Stochastic Models for Finance*, Padua (Italy), 8-12 February 2016.

Workshop *Likelihood, Approximate Likelihood and Nonparametric Statistical Methods for Complex Applications*, Venice (Italy), 8 - 9 October 2012.

Conference in honor of the 70th birthday of Wolfgang J. Runggaldier, Padua (Italy), 21 - 22 September 2012.

67th Seminaire Lotharingien de Combinatoire joint session with XVII Incontro Italiano di Combinatoria Algebrica, Bertinoro (Italy), 18-21 September 2011.

Summer School in *Mathematics Stochastic and Numerical Methods in Finance*, Cortona (Italy), 3-16 July 2011.

XVI Incontro Italiano di Combinatoria algebrica, Bologna (Italy), 7-9 June 2010.

Workshop INdAM *Incontro Nazionale di Algebra moderna*, Rome (Italy), 24-28 May 2010.

Mathematical Foundations of Quantum Information, Seville (Spain), 23-27 November 2009.

63th Seminaire Lotharingien de Combinatoire joint session with XV Incontro Italiano di Combinatoria Algebrica, Bertinoro (Italy), 27-30 September 2009.

Spring School in Finance 2009, Università di Bologna, Bologna (Italy), 21-22 May 2009.

## Organizing committee (Conferences and Workshop)

New professional and scientific perspective in pensions and actuarial sciences, Sapienza University of Rome, 5–6 April 2023

AMASES 2022, University of Palermo, Special Session: "Innovations in Finance and Insurance", 22 – 24 September 2022

XII Research Day Memotef 2022, Istituto di Studi Romani, 31 May-1 June 2022

XI Research Day Memotef 2019, Sapienza University of Rome, Faculty of Economics, 19-20 February 2020

AMASES 2019, University of Perugia, Special Sessions: "Innovative models for insurance" and "Advanced methods in financial modeling"

The undersigned declares, under her own responsibility, according to articles 46 and 47 of the Presidential Decree No. 445 dated 28th December 2000, that everything stated in the present declaration and in the relevant attachments is true, and that she is aware of the legal sanctions for fraudulent statements in art. 76 of the Presidential Decree No. 445/2000.

The undersigned authorizes the use of her personal data in compliance with Legislative Decree 196/03.

May 22, 2023