**CURRICULUM VITAE**

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**Education**. 2003-2005: PhD in **Applied Statistics** at Department of Statistics, University of Florence. PhD thesis: “Estimating the Diffusion Part of the Covariation between two Stochastic Volatility Models with Levy Jumps ".

1. **Academic research**
* From April 1st, 2020 to March 31, 2023 I was a temporary researcher at the Department of Economics and Statistics of the University of Siena.
* In the period 2010-2012 I participated in the "NUS-RMI Credit Rating Research Project" on the basis of an "application" launched by the Risk Management Institute (RMI) of the National University of Singapore (NUS) which saw our project among those selected. Our research group involved the Bank of Italy and the University of Bologna in the people of prof. Umberto Cherubini, prof. Silvia Romagnoli and myself (University of Bologna) and dr. Roberto Violi (Head of Risk Management Quantitative Models and Analytical Research Team at the Bank of Italy). Each member of the research group was responsible for a specific part of the project in consideration of the amount of data we had available and their particularity. The promoter / referent of the project was prof. Chua Beng Yan (Senior Associate Director, Risk Management Institute, National University of Singapore). We participated in the preliminary selection for access to financing announced by the NUS by presenting a probit model with "random effects" for estimating and forecasting the event of default. We have passed this preliminary phase (the email with which we were informed that our project had been selected is attached) and therefore we took part in the actual research project which provided for the proposal of a model by all the Universities. selected (University of Toledo, Humboldt Berlin, Stanford and many others) to be compared with the benchmark model provided by the NUS Risk Management Institute itself. In detail, the purpose of the research was the analysis of a large dataset relating to small and medium-sized Asian companies (cit. "The RMI credit research database build 300 covers public companies from 12 Asian economies") and the creation of a model credit risk stochastic for the assessment of their credit efficiency. In particular, we focused on probit models with random and fixed effects In order to increase collaboration and knowledge of data in May 2010 I was Visiting Researcher at the NUS - RISK MANAGEMENT INSTITUTE (RMI) (21 Heng Mui Keng Terrace, Level 4, Singapore 119613), funded by RMI as a member of a research group whose project was selected, a period in which our main purpose was to study and organize the dataset of Asian companies in order to characterize their specificity by building and statistically analyzing a rather large number of variables of an economic and financial nature. The work at the RMI was mainly aimed at arranging the large mass of data that was somewhat disordered and lacking. In the remaining period of time, we specified and estimated a credit risk model, collaborating mainly with the Bank of Italy through a series of meetings, which took place at the Rome office between 2011 and 2012. The project, in November 2012 found its conclusion and the results converged in the paper that I am attaching: Cherubini U., Gobbi F., Villani E., Violi R. (2012). "Credit Risk Appraisal: Measurement, Validation and Ratings", for NUS-RMI Credit Rating Research Project. My responsibility in the modeling team involved all the preliminary part of data analysis and arrangement, adaptation of the same to the model we proposed, assistance in the estimation and forecast phases with the model we proposed.
* Participation in the "Copulas and Stochastic Processes" Research Group, with Profs. Umberto Cherubini, Sabrina Mulinacci and Silvia Romagnoli. The project aimed to extend the C-Convolution operator to stochastic processes. The C-Convolution, introduced in 2011 by Cherubini, U., Mulinacci, S., & Romagnoli, S. (2011) "A Copula-based Model of Speculative Price Dynamics in Discrete Time", Journal of Multivariate Analysis, 102, 1047 -1063, is a mathematical operator that determines the probability distribution of the sum of two NON independent random variables X and Y. More precisely, dependence is modeled through a copula function. The extension to the case of stochastic processes presented many difficulties both from a theoretical and a practical point of view. During the project we have identified the theoretical solutions and started to propose applications to historical series of a financial nature, addressing the problem of estimating the distribution of the sum. The main results were collected in the volume Cherubini U., Gobbi F., Mulinacci S., Romagnoli S. (2012) "Dynamic Copula Methods in Finance", Wiley, which quickly became a significant reference point for both econometrics of financial time series is more strictly about finance, reaching 237 citations on Scholar Google in September 2022.
* Participation in the "Copula based Econometrics" project co-financed by the Department of Statistical Sciences "P. Fortunati" of the University of Bologna (Prof. Umberto Cherubini and Sabrina Mulinacci as referents / promoters) and by Prometeia s.p.a. (Piazza Trento e Trieste, 3, 40137 Bologna BO). The aim of the project was to construct a new increment-dependent Markov process with the time dependence determined by a copula function. The theoretical starting point came from the "copula-based Markov processes" introduced by Chen X., Fan Y. in 2006 with the paper "Estimation of copula-based semiparametric time series models" published in the Journal of Econometrics, 130 (2). Their model used the copula function as a model of dependence between the process value at time t and the process value at time t-1 ", our model is instead of the" level at time t-1, next increment "type. , based on C-Convolution extended to stochastic processes. In other words, the copula function models the dependence between the value of the process at time t-1 and its subsequent increment. The collaboration with Prometeia had the primary purpose of identifying a field of application particularly suitable for the properties of the process we were building. The results of the project were presented in the volume Cherubini U., Gobbi F., Mulinacci S. (2016) "Copula Based Econometrics", SpringerBriefs in Statistics, which was reviewed in the Journal of Economic Literature: Beare B.K. (2017) "Copula based econometrics", Journal of Economic Literature, 55 (4), 1615-1619. Further research developments and theoretical advances related to au toregressives and random walks with dependent increments were presented in the paper Gobbi F., Mulinacci S. (2020) "Mixing and moments properties of a non-stationary copula-based Markov process", Communications in Statistics: Theory and Methods, 49 (18 ), 4559-4570.
* Between 2018 and 2020 the Department of Statistical Sciences of the University of Bologna and the Department of Statistics, University of Sao Paolo, Brazil, established a continuous collaboration relationship promoted by Prof. Sabrina Mulinacci (University of Bologna) and by Prof. Nikolai Kolev (University of Sao Paolo), in which I participated with the aim of working on an extension project of the well-known Marshall-Olkin model of dependence. Professor Kolev was Visiting at the Department of Statistical Sciences in Bologna between January and March 2018 and two weeks in September 2019. Prof. Mulinacci was a guest of the Department of Statistics of Sao Paolo in February 2020. Due to the Covid-19 pandemic it was not possible to carry out further mutual study and research stays and the collaboration continued remotely. The heart of the collaboration was the extension of the famous Marshall-Olkin model of dependence, introduced by the two authors in 1967, which assumes independence between idiosyncratic shocks and systemic shocks on the timing of occurrence of an event (in our case the death of one or both spouses). Our extension has allowed us to consider a dependence structure between idiosyncratic shocks through a copula function, in the belief that similar lifestyles, common habits and so on can determine a link between non-negligible idiosyncratic events. An important part of the project was the retrieval of insurance-related data and their processing in order to apply the dependency models developed by us to a particularly relevant empirical case as it has already been extensively studied in the literature. This allowed us to compare our results with those of other models. The collaboration gave rise to two papers published in class A journals according to the ANVUR classification: Gobbi F., Kolev N., Mulinacci S. (2019) "Joint life insurance pricing using extended Marshall-Olkin models", ASTIN BULLETIN , (49), pp. 409 - 432 and Gobbi F., Kolev N., Mulinacci S. (2021) "Ryu-type extended Marshall-Olkin model with implicit shocks and joint life insurance applications", INSURANCE MATHEMATICS & ECONOMICS, 101, pp. 342 - 358.
1. **Partecipation in national or international Conferences and Workshops**
* Sco 2005 Conference, University of Padua, September 4-6, 2005. Bressanone. Presentation of the results obtained with the PhD thesis: “Estimating the Diffusion Part of the Covariation between two Stochastic Volatility Models with Levy Jumps ".
* AMASES 2006 Conference, University of Trieste. 4-7 September 2006, Trieste. Presentation of the research results: "Diffusion Covariation and Co-Jumps in bidimensional Asset Price Processes with Stochastic Volatility and Infinite Activity Lévy Jumps.
* IX Workshop on Quantitative Finance, University of Rome Tor Vergata. 24-25 January 2008. Presentation of the results of the research: "Identifying the Diffusion Covariation and Co-Jumps given Discrete Observations".
* Conference on "Dynamic Copula Methods in Finance", Department of Mathematics for Decision-making, University of Bologna. 6-11 October 2010. Presentation of the research results: "Dependent Increments Markov Processes". I was the organizer of the same conference together with profs. Umberto Cherubini and Sabrina Mulinacci.
* XII Workshop on Quantitative Finance, University of Padua (Italy), January 27-28, 2011. Presentation of the results of the research: "Semi Parametric Estimation and Simulation of Actively Managed Portfolio".
* 9th International Workshop on Applied Probability, IWAP, Budapest, June 18-21, 2018. Presentation of the research developed in several articles: "Convolution Autoregressive Processes", in the session "Copula functions".
* Invited Discussant of the paper S. Zedda, A. Pagano, G. Cannas: "A simulation approach to distinguish risk contribution roles to systemic crisis", European Commission, Joint Research Center, Institute for the Protection and Security of the Citizen. XIV Workshop on Quantitative Finance, Rimini Campus of the University of Bologna, Rimini, Italy, 24-25 January 2013.
1. **Teaching activities in italian and foreign Universities**
* Assignment of the role of Senior Teaching Assistant within the "Quantitative Approaches to Risk Assessment" course at SAIS (School of Advances in International Studies), **JOHNS HOPKINS UNIVERSITY**. The course, set up on an experimental basis within the **MASTER OF ARTS IN GLOBAL RISK**, aimed to train the students of the JHU in Finance and Risk Management. The assignment that concerned me consisted of 20 hours of frontal lessons and 20 hours of assistance to students (4 hours a week divided into 2 hours of lessons and 2 office hours, for 10 weeks), plus assistance in phase final verification. The topics I covered were preparatory to the course and in particular they were: 1. Introduction to probability, random variables, distributions and moments (8 hours) 2. Introduction to option pricing theory (Black and Scholes model) (6 hours) 3 .Data analysis with Excel: financial index as underlying asset, time series of returns, statistical analysis of the time series, etc. (6 hours). On average, the class consisted of 20 students. I held the course with the same structure for two academic years (2017/2018 and 2018/2019), in particular during the Spring Semester in the periods February-May 2018 and February-May 2019. I enclose the letter of assignment relating to the first of the two academic years.
* As part of the II level Master in Quantitative Risk Management, University of Bologna in collaboration with CRIF SpA, I held two courses: 1. "Programming in R" course, 5 hours of lectures on the applications of software R to finance; 2. “Advanced Credit Risk 3” course, 10 hours of lectures on credit risk in a multivariate context. In particular, the program of this latter course included: 1. Credit Derivatives; 2. Copulas and survival copulas; 3. Basket default swaps and CDO; 4. Valuation of CDSs and CDOs. Total 15 hours of frontal lessons. The assignment of the course took place for the years 2019, 2020 and 2021.
* Assignment of the "Copula-based Econometrics" course as part of the "Workshop on Copula Functions", Master's Degree in QUANTITATIVE FINANCE, University of Bologna, Academic Year 2012/2013. 10 hours of frontal lessons in English. The topics covered are the following: 1. The likelihood function in the case of i.i.d. random variables; 2. Estimation of copula models; 3. Copula-based Markov processes; 4. Copulas and persistence; 5. Conditional copulas and C-Convolution-based econometrics.
* Adjunct Professor for the "Mathematics Applied to Economics" course, Degree Course in Economics, Markets and Institutions, School of Economics, Management and Statistics, University of Bologna, Academic Years 2013/2014 and 2014/2015. 40 hours of lectures. Approximately 80-100 students per academic year.
* Adjunct Professor for the second module of the course "Life Insurance and Managed Savings. Module II", Degree Course in Insurance and Business Finance, School of Economics, Management and Statistics, University of Bologna, Rimini Campus Academic year 2013/2014, 2014/2015 and 2015/2016. The course included 30 hours of frontal lessons.
* Assignment of the "Laboratory in Probability" course, Master's Degree in Quantitative Finance, University of Bologna, for the academic years 2012/13, 2013/14 and 2014/15. The course included 20 hours of frontal lessons in English and a final exam.
* Lecturer of the FINANCIAL MATHEMATICS course (as RTDB researcher of the Department of Economics and Statistics) at the University of Siena. Bachelor's degree (DM 270) ECONOMICS AND TRADE A.A. 2020/21, 2021/22 AND 2022/23. 60 hours of frontal lessons in English. Approximately 80-100 students per academic year.
* Lecturer of the FINANCIAL ENGINEERING course (as RTDB researcher of the Department of Economics and Statistics) at the University of Siena, Master's Degree Course FINANCE - FINANZA A.A. 2019/20. 20 hours of frontal lessons in English.
* Lecturer of the CREDIT RISK MODELING course (as RTDB researcher of the Department of Economics and Statistics) at the University of Siena, Master's Degree Course FINANCE - FINANZA A.A. 2019/20. 20 hours of frontal lessons in English.
* Lecturer of the MODELS OF FINANCIAL MARKETS course (as RTDB researcher of the Department of Economics and Statistics) at the University of Siena. Bachelor's degree (DM 270) ECONOMICS AND BANKING A.A. 2020/2021 and 2021/22. 30 hours of lectures.
1. **Non-academic professional activity**
* From October 2014 to December 2019 I was scientific advisor at Credit Data Research Ltd. (CDR), with registered office in Liverpool, Street, 55 Old Broad Street EC2M 1RX, London UK, which mainly deals with Credit Passport. The company, born just under a year earlier, was trying to develop a credit risk model starting from that inherited from a previous company, Default Metrics (DM). When I started the collaboration, I was commissioned to study the DM model to understand if it was possible to improve its forecasting performance in light of the new data available from the Central Credit Register of the Bank of Italy. A very substantial mass of data referring punctually to individual companies that had opened a loan relationship with the Italian banking system. I started this study phase by leading a team of two analysts, young graduates in Quantitative Finance at the University of Bologna, both of my former students, mainly in the London office of CDR.
* From June 2015 onwards, an economic collaboration took place between CDR and the Department of Statistics"P. Fortunati" of the University of Bologna (for example by co-financing my research grant) which brought other young graduates to internal team of CDR analysts. Also in this phase my role was as scientific manager of the model that began to take shape. In particular, we have developed an ad hoc model (for the type of data available) with the primary purpose of estimating the probability of default. The model (Credit Data Behavioral, CDB) is in fact based on behavioral inputs from the Central Credit Register of the Bank of Italy, an innovative and continuous flow of data on the credit exposures of economic entities, mainly represented by small and medium-sized enterprises. The work required various phases: 1. selection of the variables with particular attention to their ability to predict the default; 2. model estimation (the estimation codes have been drawn up in R); 3. validation of the estimated model. My role as scientific manager was essentially to guide the three aforementioned phases, participating with greater intensity in the estimation and validation phases and approving each step.
* During the collaboration, in parallel with the development of the CDB model, I followed a second important line of research to which I dedicated most of the time between 2016 and 2018, again in the context of a joint funding with the Department of Statistics "P. Fortunati" of the University of Bologna. In fact, CDR's objective at that time was to submit the model developed by us to the Rating Tool procedure within the ECAF (Eurosystem Credit Assessment Framework) at the European Central Bank, obtaining certification after an application duration precisely two years. The very stringent criteria to which a credit model is subjected, in order to obtain this ECB certification, have been analyzed point by point by our team and the objectives have been achieved after many adaptations and improvements of the original model. Upon request, I can provide the document that summarizes the path taken and illustrates the results of the analyzes in the direction requested by the European monetary authority. In carrying out this project we collaborated with the Bank of Italy, and in particular with the division that deals with credit risk and rating tools, presenting our model at the Rome office and holding a series of meetings to show progress some jobs.
* The conclusion of my collaboration with CDR took place in 2019. The CDB model, conceived and developed over the years, was integrated by the financial model Moody's (company with which CDR entered into a financial relationship) called RiskCalc , thus generating a PD consisting of a behavioral part and a financial part in collaboration with Moody's team of analysts. In particular, in this phase the work was mainly of statistical integration of the two models, one, CDB, which uses behavioral variables processed by the Central Risks flows, the other, Riskcalc, which uses financial variables elaborated starting from the financial statements. Over the last year I have also supervised the new data flow available, this time from the United Kingdom (Business Current Accounts (BCA) from UK small businesses). In this phase I also witnessed the entry of a new analyst in the CDR team, graduating in Quantitative Finance whose thesis was followed by me (together with Prof. Mulinacci) entitled "Regime-switching models for the calculation of bank accounts probability of default”, interesting since it provided a new method for estimating the probability of default.
* During the three-year period 2015-2017 I worked as a consultant for the Patti Chiari Consortium, founded in 2003, with the participation of 16 of the major Italian banks for a total of 56% of the branches present in Italy. The Consortium had promoted an investment initiative for individuals known as the OBBRR list (low risk and low yield bonds) which included some bonds issued by the American bank Lehman Brothers, which on 15 September 2008 announced its intention to make use of Chapter 11 of the US Bankruptcy Code (a procedure that is implemented in the event of bankruptcy) by announcing bank debts for 613 billion dollars, bond debts for 155 billion and assets for a value of 639 billion. Many civil cases have been brought against the Consortium since 2009 by private citizens who had lost a substantial part of their investment. The question to which an answer of a technical and scientific nature had to be given was related to whether it had been possible to predict in advance the collapse of the yield of the instrument object of the investment and ultimately the bankruptcy of the bank itself. My contribution was to analyze the specific instrument and give an answer as empirical as possible. I held a series of meetings with the consultants of the various Courts and the various parties involved and prepared a series of briefs in which I statistically and financially analyzed the bond instrument object of the appeal and the market context in which the OBBRR list had been conceived.
1. **Other Titles**
* Since September 2022 I have been invited as Associate Editor of the international journal Reliability:Theory & Applications (ISSN 1932-2321) published by the Gnedenko Forum since January 2006. The Journal covers various areas of risk analysis with a focus on industry. However, in recent years he has increased his publications in the area of finance and investment risk analysis. For this reason, interest in scholars of this sector is growing. The link for the editorial board of the journal is http://www.gnedenko.net/Journal/editorial.htm.dal
* I joined the list of future members of the editorial board of the Journal of Statistics and Management Systems. The Journal's mission is as follows: The Journal of Statistics and Management Systems (JSMS) is a world leading journal publishing high quality, rigorously peer-reviewed original research on theoretical and applied statistics and management systems. The scope is intentionally broad, but papers must make a novel contribution to the field to be considered for publication. Topics include, but are not limited to, the following: • Statistics • Applied Statistics • Industrial Statistics • Statistical Inference • Interdisciplinary role of Statistics • Actuarial Sciences • Decision Sciences • Managerial Aspects • Management Science • Management Information Systems
1. **Scientific publications**
* Cherubini U., Gobbi F., Mulinacci S., Romagnoli S. (2012): "Dynamic copula methods in Finance", John Wiley & Sons
* Cherubini U., Gobbi F., Mulinacci S. (2016): "Convolution Copula Econometrics", SpringerBriefs in Statistics
* Gobbi F. (2015): "Probability Theory. An Introduction", Tempus Pucunia Est Collana di Matematica per le Scienze Economiche, Finanziarie e Aziendali, Aracne Editrice, ISBN 978-88-548-7824-2, formato 17 x 24 cm, 56 pp
* Gobbi F., Mulinacci S. (2023). "The impact of the time-varying dependence structure on the Value at Risk of a portfolio of exchange rates during the Covid-19 pandemc", under review
* Cherubini U., Gobbi F., Mulinacci S. (2023). "Singularity Bias, Systemic Risk and Credit Indexes", under review. Available at [https://ssrn.com/abstract=3409951](https://ssrn.com/abstract%3D3409951)
* Gobbi F., Mulinacci S. (2023)."State-Dependent Autoregressive Models: Properties, Estimation and Forecasting", under review. Available at [https://ssrn.com/abstract=3823235](https://ssrn.com/abstract%3D3823235).
* Gobbi F.(2023). “The Great Recession of 2008 and the COVID-19 pandemic: a comparison on their impact on volatility and dependence structure among European stock market indexes”, under review.
* Gobbi F., Mulinacci S. (2022). "Estimation and forecasting of the Japan GDP growth rate using a state-dependent autoregressive model", ***Central European Journal of Economic Modelling and Econometrics*, *14(1)***, 1-27
* Gobbi F. (2021). "Evaluating Forecasts from State-Dependent Autoregressive models for US GDP growth rate. Comparison with alternative approaches", ***Advances in Management & Applied Economics*, 11(6)**, 117-138
* Gobbi F., Kolev N., Mulinacci S. (2021). "Extended Marshall-Olkin-Ryu Model with Implicit Shocks and Applications", ***Insurance: Mathematics and Economics, 101***, 342-358
* Gobbi F. (2021). "The problem of detecting nonlinearity in time series generated by a state-dependent autoregressive model. A simulation study", ***Int. J. of Operational Research, 45(2)***
* Gobbi F., Mulinacci S. (2020). "Mixing and moments properties of a non-stationary copula-based Markov process", ***Communications in Statistics: Theory and Methods, 49(18)***, 4559-4570
* Gobbi F., Kolev N., Mulinacci S. (2019). "Joint Life Insurance Pricing Using Extended Marshall-Olkin Models", ***ASTIN Bulletin - The Journal of the International Actuarial Association***, ***49(2)***, 409-432
* Gobbi F. (2018). "Tail behavior of a sum of two dependence and heavy-tailed distributions", *Journal of Statistics and Management Systems, 21(6)*, 933-953
* Gobbi F. (2016). "Convolution Based Unit Root Processes: A Simulation Approach", ***International Journal of Statistics and Probability, 5(6)****,* 22-31
* Gobbi F. (2014). "The Conditional C-Convolution Model and the Three Stage Quasi Maximum Likelihood Estimator", ***Journal of Statistics: Advances in Theory and Applications, 12(1)***, 1-26
* Cherubini U., Gobbi F. (2013). "A Convolution-based Autoregressive Process", in F. Durante, W. Haerdle, P. Jaworski editors. Workshop on Copula in Mathematics and Quantitative Finance. Lecture Notes in Statistic Proceedings. Springer, Berlin/Heidelberg.
* Mancini, C., Gobbi F. (2012). "Identifying the diffusion covariation and the co-jumps given discrete observations", ***Econometric Theory, 28(2)***, 1-25
* Gobbi F., Mancini C. (2007). "Estimating the diffusion part of the covariation between two volatility models with jumps of Lévy type", In: ed.s V.Cutello, G.Fotia, L.Puccio. Applied and Industrial Mathematics in Italy II, Selected contributions from the 8th SIMAI Conference, vol. 75 in Series on advances in Mathematics for Applied Sciences, pp 339-409, Hackensack, NJ 07601 USA: World Scientific. Pubblicazione ISI.