Università Ca'Foscari Venezia

Dipartimento di Economia

VERA/CADEMY

Rep. n. 664/2024 Prot n. 109768 del 17/05/2024

11th EDITION - CALL FOR SELECTION OF N. 9 VERA INTERNSHIP GRANTS AT THE DEPARTMENT OF ECONOMICS - A.A 2023/2024, WITHIN THE PROJECT OF EXCELLENCE 2023-2027

Art. 1 – Scope

1.1 The Department of Economics, within the new project of the Department of Excellence 2023-2027 – "Venice Initiative on Vulnerability Analysis", offers to the students enrolled in its Master's Degree Courses the VERA Academy internship projects, to promote the development of professional and research skills useful for their orientation and subsequent labor market integration.

1.2 Nine grants are available, among which three funded by Assoreti – Associazione delle Società per la Consulenza agli Investimenti. The maximum duration of the internship periods will be 4 months and a commitment of about 300 hours that will be agreed with the tutor of the project. The internships will take place between July and November 2024. The total funding for each internship will be € 1.843,31 (gross salary). Each internship project is described, with the indication of objectives, required knowledge and skills and tutor, in Annex A, which is an integral part of this call.

1.3 The internship will take place at the Department of Economics according to the Ca' Foscari internships guidelines.

1.4 Upon request of the student, the internship activity can be recognized as fulfilling the compulsory internship activity required by the Master's degree program to which the student is enrolled[1].

Art. 2 – Admission requirements

2.1 The call is open to students regularly enrolled in the Master's Degree Courses offered by the Department of Economics.

2.2 The call is also open to students regularly enrolled in the International Master in Economics, Finance and Data Science exclusively for the projects funded by Assoreti (code 14 and code 29)
.

2.3 Students already receiving a grant economically incompatible with the grant of the present call, can apply and, if eligible, they can carry out the internship project conditional on renouncing the VERA ACADEMY grant.

2.4 The total numbers of internships cannot exceed 11 (maximum of 9 with grant and maximum of 2 without grant), therefore the acceptance of internship applications "without grant" is subject to the above limits.

2.5 The requirements must be met by the deadline indicated in the following art.3.

1 Students enrolled at Data Analytics for Business and Society are recommended to carry the aforementioned activity out as an extracurricular internship.

Art. 3 – Applications

3.1 Applications must be submitted no later than **June 14th, 2024 at 12.00** by filling the online form at the page: https://apps.unive.it/domandeconcorso-en/accesso/2024-dec-veraacademy-01

3.2 When filling the application in, candidates can indicate up to a maximum of three internship projects, in non-binding order of preference.

3.3 The application form must include the following documents:

- Dated and signed Curriculum vitae
- Duly signed self-certifications of enrollment with the indication of exams and relative grades at both bachelor and master level.
- Motivation letter (using exclusively the form attached to this call). In the motivation letter, the student must highlight the coherence between his academic background, in terms of acquired knowledge, skills and abilities, and the activities and objectives of each internship projects chosen (see Annex A).
- Scanned copy of a valid ID document.

3.4 Applications that are not accompanied by all the required documentation, applications which i) do not indicate the internship projects for which the candidate is applying, ii) indicate a number of internship project beyond the maximum allowed, iii) do not rank the internship projects indicated, and applications submitted after the deadline or through other procedures, will not be considered.

3.5 The University is not responsible for any failure to receive communications due to incorrect or incomplete indication of address by the applicant or to the lack of or the late communication of change of address, as well as possible postal failures not attributable to the fault of the administration itself.

Art. 4 – Commission and selection of applicants

4.1 A commission composed by prof. Stefano Magrini, prof. Michele Costola and dr. Andrea Albarea will evaluate the candidates on the basis of their qualifications and motivation letters.

4.2 In a preliminary session, the Commission will define the evaluation criteria and the scoring rules for the professional and academic curriculum vitae and for the motivation letter, as well as the minimum threshold for grant eligibility.

4.3 The ranking list will be formulated on the basis of the following criteria:

- weighted average exam marks – GPA ;
- numbers of University credits (*CFU, Crediti Formativi Universitari*)[2];
- evaluation of the Curriculum Vitae;
- evaluation of the motivation letter.

4.4 Applications from candidates that were beneficiaries of the VERA grant in the previous calls will be accepted but in the selection procedure priority will be given to candidates that never received the VERA grant.

4.3 The following applications will be excluded from evaluation:

- Applications which do not comply with the admission requirements of the announcement.
- Applications which do not comply with the instructions indicated in art.3.

2 In order to guarantee uniformity of treatment in the selection, for students enrolled in the Economics-QEM curriculum the 7 CFU exams will weigh, given the higher commitment in terms of frontal teaching, as 12 CFU.

Art. 5 –Ranking list

5.1 At the end of the evaluation process, the Commission will provide a ranking list sorting the candidates by decreasing total score.

5.2 The ranking list, together with the projects assignments, will be published on the web site of the Department of Economics at the following web address www.unive.it/vera, Vera Academy section, after June 28th, 2024.

Art. 6 - Assignment of grants

6.1 At the end of the evaluation process, the Secretariat of the Department of Economics will notify the selected candidates, communicating the starting date of the internship grant.

6.2 The Winners will have to send their acceptance (via e-mail to the following address: centro.vera@unive.it) within 5 days from notification. If a candidate turns down a grant, it will be assigned to the candidate ranked next.

6.3 Grants will be paid in one single instalment at the end of the internship after the submission of the final report approved by the academic tutor.

Art. 7 – Obligations for winners

7.1 Winning students, with the support of the "company" and academic tutors, must, as a condition of the grant, agree to carry out the approved procedures to set up their internship, to prepare training projects and all the related administrative procedures.

Art 8 – Incompatibility

8.1 The present grant can be received in conjunction with any other grants except in case of express incompatibility specified by applicable law, Regulations of the University and other specific calls in which the candidates participated (See Art. 2.2)

Art. 9 – Cross-reference

9.1 For any relevant matters not mentioned in the call, reference is made to the current University Regulation for the assignment of grants, study awards and incentives to students to sustain enrollment for courses and other specific learning activities.

Art. 10 – Person in charge of the procedure

10.1 The person in charge of the selection procedure, within Law n.241/1990, is the Secretary of the Department of Economics, Ing. Silvia Lovatti. For further information concerning the selection procedure, please send an e-mail to centro.vera@unive.it.

Art.11 – Processing and protection of personal data

11.1. Personal data sent by the candidates with the application forms will be processed according to national and European legislation (Italian Legislative Decree n. 196/2003 and Regulation EU 2016/679). For further information see https://www.unive.it/pag/36610/.

Department Director
Prof. Giacomo Pasini

Person in charge of the procedure
Ing. Silvia Lovatti

ANNEX A

Code	internship project	Analysis of the modeling literature: climate change vs. sustainability
1	**Activity details**	Climate change science has given a big boost to modeling, also in the economic field, but above all in that of integrated models on a global scale. The tools adopted so far have been mainly based on approaches deriving from general equilibrium models, used for long-term projections, typically until the end of the century. The fact that these approaches have been adopted by the Intergovernmental Panel for Climate Change (IPCC) has given these models a sort of certification at an international level. More and more often, however, these approaches are criticized from various points of view: the concept of equilibrium itself is questioned, as are the numerous assumptions that they adopt, which are very distant from reality. Sustainability science has a much less extensive literature and is more focused on local or regional scales, but in theory the two topics should be largely overlapping. It is therefore interesting to compare them.
	Tutor	Carlo Giupponi
	Positions	2
	Requirements	Having passed the micro and macroeconomics exams, possibly having passed an exam related to the topics of climate change, sustainability, or environmental economics.
	Starting date	June or Spetember
	Further information	

Code	internship project	A networks approach to pension funds ESG driven investment
2	**Activity details**	Environmental, Social and Governance (ESG) considerations are an increasingly important issue for pension schemes. Managing new ESG obligations requires the funds to demonstrate that they are effectively managing ESG issues in relation to their scheme. In this project we first use complex networks techniques to analyze similarities in the Italian pension funds investement strategies to address the ESG constrains. We further use Data Envelopment Analysis (DEA) methologies to assess the efficiency of funds investment decision, both from a financial and an ESG point of view, and to compare the performance of pension funds esplicitely adopting ESG an ESG screening with that of the other mutual funds, not focused on ESG considerations.
	Tutor	Antonella Basso e Giulia Iori
	Positions	1
	Requirements	A good familiarity with a programming language, e.g. C, R, Python or Matlab, is required.
	Starting date	June 2024
	Further information	

Code	internship project	A network approach to measure ESG risk in Insurance.
3	**Activity details**	The potential systemic impact of climate risks has become a central concern in both financial and non-financial sectors. This project explores a network-based empirical framework, informed by environmental and stock market data, to assess the potential for ESG-driven systemic risk within the insurance sector. The combination of low investment returns, increased volatility, and high capital requirements has pushed insurers towards alternative asset management strategies, increasing their exposure to assets with greater complexity and lower liquidity. Additionally, reinsurance has been playing a larger role in the insurance

		industry. In principle, reinsurance can enhance risk diversification by transferring risk among insurers. However, the interconnections that arise through overlapping portfolios or insurance/reinsurance relationships can act as transmission mechanisms for financial shocks, leading to systemic risk. Particularly, losses in the value of insurance companies' portfolios and increases in claims due to extreme weather events or regulatory changes can threaten financial stability if these shocks are transmitted through the system. In this project, we will start by constructing the network of ESG risk insurance exposure through the analysis of insurance portfolios. We will then use network metrics to quantify ESG systemic risk and identify the main channels of ESG contagion within the insurers' network
	Tutor	Antonella Basso e Giulia Iori
	Positions	1
	Requirements	A good familiarity with a programming language, e.g. C, R, Python or Matlab, is required.
	Starting date	June 2024
	Further information	

Code	**internship project**	**Analysis of the impact of the environmental investments on the financial efficiency of firms**
4	**Activity details**	Climate change and the transition to net zero carbon emissions may entail additional efforts and risks for companies. However, at the same time, investments made by firms to integrate environmental (the E pillar of ESG issues) considerations into their activity can also give rise to opportunities, with an overall impact on the firm's performance to be assessed. This project aims to analyze the performance of a set of European firms to answer the following research question: how is the firms' financial efficiency related to its environmental efforts? Are the results significantly different depending on the economic sector? The investigation will apply the Data Envelopment Analysis (DEA) methodology, which allow for the simultaneous consideration of multiple input and output factors impacting firms' efficiency. The research activity will be organized as follows: i) review of the literature; ii) variables specification of the model; iii) implementation of the model; iv) analysis of the efficiency results.
	Tutor	Antonella Basso
	Positions	1
	Requirements	1. Having passed the following exams: An exam of mathematics or quantitative methods for economics or for finance or for management; An exam of statistics or econometrics; 2. Advanced knowledge of Excel (including the use of filters, tables and graphs) and familiarity with a programming language (R or Python or Stata or Matlab).
	Starting date	June 2024
	Further information	A priori knowledge of DEA methodology is not necessary

Cod	**internship project**	**Geographical Analysis of Welfare Expenditure in Italy: local and regional disparities**
5	**Activity details**	The research project aims at documenting and monitoring the supply and demand of local services in Italy (for example the presence of long term care services, childcare), with a specific focus on the local and regional disparities. The research assistant will provide support on a systematic literature review and a preliminary analysis of administrative data (ISTAT) and/or survey questionnaires modules relevant to empirical analysis.
	Tutor	Gloria Moroni
	Positions	1
	Requirements	Good knowledge of the English and Italian languages. Knowledge of Excel and STATA software.

	Starting date	June 2024
	Further information	

Code	**internship project**	**Analyzing and modelling the interlocking directorate network among firms**
6	**Activity details**	In the interlocking directorate network, an edge between two firms emerges when one or more CEOs of two different firms sit on each other's boards. The aims of the research are the following: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to review the literature on interlocking directorates from different fields with emphasis on the recent papers; to extract the interlocking directorate networks and to provide network analysis; to make inference on random network models using interlocking directorate data and investigate the relationship between the network topology and the balance sheet indicators; to write a final report where methods and results are presented and discussed. Keywords: Networks extraction, Large network data, Big data, interlocking directorate. Further information: Michael Withers, Ji Youn (Rose) Kim, Michael Howard, The evolution of the board interlock network following Sarbanes-Oxley, Social Networks, 52, 2018, 56-67. Link: https://doi.org/10.1016/j.socnet.2017.05.005. James R. Booth and Daniel N. Deli, Factors affecting the number of outside directorships held by CEOs, Journal of Financial Economics, 40, 1, (81), (1996). https://doi.org/10.1016/0304-405X(95)00838-6. Jackson, M.O. (2008) Social and Economic Networks, Princeton University Press.
	Tutor	Stefano Tonellato, Roberto Casarin
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	**internship project**	**Approximated Bayesian Computatiom methods**
7	**Activity details**	Complex models often have intractable likelihoods, so methods that involve the evaluation of the likelihood function are infeasible. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, on 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of the likelihood-free methods (e.g., ABC or synthetic likelihood) used in fitting complex models large datasets; to use likelihood-free methods to make inference on complex models such as random networks models; to develop the code for the analysis; to apply the methods to economics and finance data; to write a final report where methods and results are presented and discussed. Keywords: Inference methods, Large Networks Data, Complex models, Big data. Further information: L. F. Price, C. C. Drovandi, A. Lee & D. J. Nott (2018) Bayesian Synthetic Likelihood, Journal of Computational and Graphical Statistics, 27:1, 1-11. Link: https://10.1080/10618600.2017.1302882
	Tutor	Stefano Tonellato, Roberto Casarin
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful

	Starting date	29/06/2024
	Further information	

Cod	**internship project**	**Bayesian inference for network models with application to networks data**
8	**Activity details**	The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to use Bayesian inference methods making inference and model selection for network models in the class of exponential random graphs; to develop the code for the analysis; to apply the model and methods for network data from economics and finance such as trade, financial flows networks, and financial contagion networks; to write a final report where the method and results are presented and discussed. Keywords: Network models, Bayesian methods, Large network data, Big data, Financial networks. Further Information: Alberto Caimo, Nial Friel, Bayesian inference for exponential random graph models, Social Networks, 33(1), 2011, 41-55. https://doi.org/10.1016/j.socnet.2010.09.004; Jackson, M.O. (2008) Social and Economic Networks, Princeton University Press.
	Tutor	Michele Costola, Roberto Casarin
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	**internship project**	**Bayesian Methods for Statistical Data Privacy**
9	**Activity details**	Statistical data privacy is the field that deals with statistical methods for the public release of confidential data. Bayesian methods have played an important role in addressing data privacy challenges. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of Bayesian methods for generating synthetic data; to study differential privacy leveraging Bayesian conjugate models; to develop the code for the analysis; to apply methods to data from economics and finance such as volatility, ESG data, and financial networks; to write a final report where methods and results are presented and discussed. Keywords: Inference methods, Data Privacy, Big data. Further information: James Foulds, Joseph Geumlek, Max Welling, Kamalika Chaudhuri (2016), On the Theory and Practice of Privacy-Preserving Bayesian Data Analysis, Arxiv. https://arxiv.org/pdf/1603.07294. Christos Dimitrakakis and Blaine Nelson and Zuhe Zhang and Aikaterini Mitrokotsa and Benjamin I. P. Rubinstein (2017), Differential Privacy for Bayesian Inference through Posterior Sampling, Journal of Machine Learning Research, 18(11), 1--39. http://jmlr.org/papers/v18/15-257.html
	Tutor	Stefano Tonellato, Roberto Casarin
	Positions	3
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	internship project	**Balancing Tourism: The introduction of tourist entrance fees to manage overcrowded destinations**
10	**Activity details**	The increasing number of tourists (the so-called overtourism) has become a major problem for several cities around the world. In order to reduce the number of tourists, one possible solution is to introduce an entrance fee for visitors, as done by the Municipality of Venice. The aim of the project is twofold. First, our goal is to test tourists' Willingness to Pay for the tourist fee to enter Venice's historical city center. Second, we intend to collect the opinions of residents about the tourist entrance fee and the potential use of its revenues. The intern will conduct a pilot survey on both tourists and residents in Venice. This survey will be propaedeutic to the preparation of two large surveys that we intend to perform both in Venice and in Florence. Specifically, the intern will: 1) Help us in the preparation of the questionnaires. 2) Conduct in-person interviews with tourists and residents on-site. 3) Prepare a dataset with the answers and perform a preliminary statistical (descriptive) analysis.
	Tutor	Bastianello, Camatti, Di Cataldo, Pizzi
	Positions	2
	Requirements	Mandatory requirement. 1) Proficiency in English: The intern must either be enrolled in an English-language curriculum (preferred) or have successfully completed an English language proficiency exam. 2) Proficiency in Italian. Preferential 1) Fluency in an additional language (French, German, Spanish). 2) Completion of a statistics exam covering survey techniques, sampling, and data analysis. 3) Proficiency in Excel.
	Starting date	June 2024
	Further information	

Code	internship project	**Economic complexity and growth: from firms to territories**
11	**Activity details**	Initially, the research fellow would undertake a thorough review of the existing literature to understand how this concept has been previously applied. This step is essential to then develop quantitative methodologies that measure the technological complexity of firms through indicators such as patents, innovations, and research and development investments. The research would focus on the link between technological complexity and other dimensions of business performance, exploring how these factors influence revenue growth, productivity, and market competitiveness. In parallel, the fellow would dedicate themselves to the collection and analysis of economic data at the sub-national level, developing models to assess the economic complexity of regions or provinces. This study would include the use of growth indicators such as per capita GDP and employment to assess the impact of sectoral specializations and regional economic configurations on growth. The goal would be to identify patterns or trends that could positively or negatively influence economic development.
	Tutor	Sebastiano Cattaruzzo
	Positions	1
	Requirements	Excellent familiarity with STATA or R, having passed at least one course in Data Analysis or Econometrics, and an interest in the economics of knowledge.
	Starting date	September 24
	Further information	

Cod	internship project	Dimensionality reduction methods and inference in economics and finance.
12	**Activity details**	In many fields, the large dimensions and complex structure of the data gathered make simple statistical methods difficult to apply. Dimensionality reduction techniques allow the researcher to deal with the dimensionality issues. Among these techniques, tensor methods are gaining popularity. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, on 1 July 2024; (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of dimension reduction approaches with a focus on low-rank decomposition methods and factor models; to build new models and inference methods for the analysis of high-dimensional data from economics and finance; to develop the code for the analysis; to write a final report. Keywords: low-rank decomposition, big data analysis, dimensionality reduction. Further information: Tamara G. Kolda and Brett W. Bader (2009). Tensor Decompositions and Applications, SIAM Review, 51 (3), 455–500. https://doi.org/10.1137/07070111X. Liqun, Qi and Ziyan, Luo (2017). Tensor analysis: spectral theory and special tensors, Society for Industrial and Applied Mathematics. https://epubs.siam.org/doi/book/10.1137/1.9781611974751
	Tutor	Stefano Tonellato, Lorenzo Schiavon
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	internship project	Dissecting Individual Expectations on the Macroeconomy
13	**Activity details**	The RA will be involved in the following activities: (1) Testing pilot version of the survey using Prolific and Limesurvey platforms; (2) Data analysis using STATA; (3) Text analysis of open-ended questions
	Tutor	Francesco Lancia
	Positions	1
	Requirements	Be familiar with STATA, Python
	Starting date	August 24
	Further information	

Code	internship project	Econometric methods for empirical finance
14	**Activity details**	We aim at studying how a data rich environment might improve the ability to describe a more credible scenario analysis while considering financial problems. We would like to investigate how econometric tools might be exploited to provide more precise scenarios on future economic outcomes.
	Tutor	Davide Raggi
	Positions	2
	Requirements	Reserved to students enrolled at IMEF Master. Basic knowledge of both Italian and English Language
	Starting date	June 2024
	Further information	Assoreti - Reserved to IMEF students

Cod	internship project	Ensemble Learning with Bayesian Additive Regression Trees
15	**Activity details**	Modern computing power has led to breakthroughs in our ability to learn high-dimensional, complex relationships from data. Bayesian Additive Regression Trees (BART) is a nonparametric approach that exploits the convenience of the Bayesian method. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024; (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of BART; to present BART models for outcomes of different types: continuous and discrete; to apply the model and methods to data from economics and finance, such as volatility and macroeconomic data (unemployment, term structure of interest rates, inflation; to write a final report where methods and results are presented and discussed. Keywords: big data, nonparametric regression, ensemble learning. Further information: Linero, A. R. (2018). Bayesian Regression Trees for High-Dimensional Prediction and Variable Selection. Journal of the American Statistical Association, 113(522), 626–636. https://doi.org/10.1080/01621459.2016.1264957; Antonio R. Linero, Yun Yang, Bayesian Regression Tree Ensembles that Adapt to Smoothness and Sparsity, Journal of the Royal Statistical Society Series B: Statistical Methodology, Volume 80, Issue 5, November 2018, Pages 1087–1110. https://doi.org/10.1111/rssb.12293; Casarin, R., Facchinetti, A., Sorice, D. and Tonellato, S. (2021), Decision Trees and Random Forests. In Petr, H., Uddin, M.M., and Abedin, M. Z. (Eds.), The Essentials of Machine Learning in Finance and Accounting, Chapter 10, Routledge, Taylor & Francis. https://www.routledge.com/The-Essentials-of-Machine-Learning-in-Finance-and-Accounting/Abedin-Hassan-Hajek-Uddin/p/book/9780367480813
	Tutor	Stefano Tonellato
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Cod	internship project	ESG and Pension funds
16	**Activity details**	Pension funds are increasingly subject to extensive environmental, social, and governance (ESG) requirements. The recent regulations mandate the integration of climate risks and opportunities into the governance, investment strategy, and risk management processes of occupational pension schemes. New regulations are driven, on one side, by the fact that, given the typically long investment horizon of pension funds, ESG risks are more likely to materialize over time, and unsustainable practices can negatively impact financial returns for companies with poor ESG risk management. One the other side, the legal framework is evolving rapidly, driven by a combination of policymaking, scientific guidance, and societal expectations. Institutional investors, responsible for individuals' retirement benefits, are expected to deploy capital to promote ESG objectives. This is even more the case following the wider introduction of defined benefit pension schemes. While climate considerations remain pivotal in the ESG investment landscape for asset owners, there is a clear trend towards broader environmental concerns such as biodiversity, sustainable food and agriculture, as well as issues like a just transition, human rights, living wages, diversity, inequality, and tax fairness. In this project, we will review the patterns of adoption of relevant ESG laws and regulations by the pension fund industry globally, and the resulting challenges and opportunities. While we will explore current developments worldwide, the final goal will be to evaluate the response to the ESG new criteria of leading Italian pension schemes.
	Tutor	Antonella Basso e Giulia Iori
	Positions	1

	Requirements	A good familiarity with a programming language, e.g. C, R, Python or Matlab, is required.
	Starting date	June 2024
	Further information	

Code	internship project	Forecasting Network Tourism Flows
17	**Activity details**	Accurate tourist flow forecasting is always the most important issue in the tourism industry. The aim of the research is:to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, on 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to review the literature on the use of Bayesian methods for decision support in the tourism sector; analyse big data following various methods, including network analysis; to forecast tourism flows by applying time series models; to write a final report where methods and results are presented and discussed. Further Information: Gretzel, U., Sigala, M., Xiang, Z. et al. Electron Markets (2015) 25: 179. Link: https://doi.org/10.1007/s12525-015-0196-8; Shah Jahan Miah, Huy Quan Vu, John Gammack, Michael McGrath, A Big Data Analytics Method for Tourist Behaviour Analysis, Information & Management, Volume 54, Issue 6, 2017, 771-785. Link: https://doi.org/10.1016/j.im.2016.11.011; M. E. J. Newman, (2010), Networks: An Introduction, Oxford University Press.
	Tutor	Nicola Camatti, Roberto Casarin
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	internship project	Forecasting Volatility with Bayesian Neural Networks
18	**Activity details**	Processing large datasets and structured data requires ML methods such as Neural Networks. Bayesian methods have been used to account for uncertainty in NN. The aims of the research are the following: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of Bayesian Neural Network (BNN); to use BNN in forecasting financial and economic time series; to develop the code for the analysis; to apply the model and methods for forecasting financial volatility; to write a final report where methods and results are presented and discussed. Keywords: Inference methods, Bayesian Learning, Neural Networks, Artificial Intelligence, Machine Learning. Further information: Jospin, Laurent Valentin, et al. "Hands-on Bayesian neural networks—A tutorial for deep learning users." IEEE Computational Intelligence Magazine 17.2 (2022): 29-48. Link: https://ieeexplore.ieee.org/document/9756596
	Tutor	Michele Costola, Roberto Casarin
	Positions	3
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Cod	internship project	The factors driving commodity markets
19	**Activity details**	Commodity markets are an integral part of the global economy. Identifying the drivers influencing these markets is a significant objective for achieving sustainable global economic growth, reducing poverty and food insecurity, and mitigating the impact of climate change. In recent years, the quantity of some consumed commodities has increased enormously, driven primarily by population and income growth, consequently changing the relative importance of commodities. Public policies (particularly those adopted for energy and agriculture) have also contributed to and continue to influence these markets, with effects not always positive overall. However, commodity markets are heterogeneous in terms of driving factors, price behaviour, and macroeconomic impact. The relationship among economic growth, demand, and availability of commodities varies widely from country to country, depending on the stage of economic development and the wealth of natural resources. Building on these premises, the project aims to identify, at the level of one or more commodities (soft or hard) and/or geographical areas, the factors that most impact the dynamics of these markets, with particular attention to adopted public policies. A deeper understanding of these markets and the effects of adopted public policies is particularly important considering the effects produced by the COVID-19 pandemic and subsequent economic recovery and the adoption of public policies, conflicts in Ukraine and Israel-Palestine, which mainly involve the Middle Eastern area, and the transition from fossil fuels to renewable energy sources. The research activity unfolds in several phases: 1. Update analysis of the existing literature on commodity markets and construction of a synthesis framework. 2. Identification of the different databases in commodity market fields. 3. Selection of at least one commodity and collection of existing data at both global and macro-area levels. 4. Critical analysis of the methods used in the literature for processing the collected data as mentioned in the previous point. 5. Identification of new methods for processing the collected data and applicative hypothesis.
	Tutor	Paola Ferretti e M. Bruna Zolin
	Positions	2
	Requirements	Have passed at least one of the exams of the list: Optimization, Econometrics, Nonlinear Models and Financial Econometrics Advanced knowledge of Excel or knowledge of R/Matlab language and of territorial or primary sector issues. Having passed one of the following exams constitutes a preferential qualification: Commodity Markets, International Trade of Commodities.
	Starting date	June 2024
	Further information	

Code	internship project	Informative Prior Elicitation Using Historical Data
20	**Activity details**	Integrating information from historical data, expert opinion, and other data sources, such as real-world data is nowadays an important challenge in many fields. Bayesian design and analysis provide a solution to this problem.. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, on 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of methods for informative prior elicitation, including power prior, normalized power prior, the partial borrowing

		power prior, the asymptotic power prior, and the scale transformed power prior; to provide an application to standard linear econometric models such as Bayesian linear regression; to provide strategies for informative prior elicitation from expert opinion such as the Survey of Professional Forecasts from FED and ECB; to write a final report where methods and results are presented and discussed. Keywords: Inference methods, Prior elicitation, expert opinion. Further information: In van der Klaauw, W., Topa, G. and Bachmann, R. (2023), Macroeconomics with an Application to the Evolution of Uncertainty in the Survey of Professional Forecasters during the COVID Pandemic. Handbook of Economic Expectations, Elsevier. https://www.sciencedirect.com/book/9780128229279/handbook-of-economic-expectations
	Tutor	Davide Raggi, Stefano Tonellato
	Positions	2
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	**internship project**	**Large Language Models for textual financial data investigations**
21	**Activity details**	Large Language Models (LLMs) are recently emerged methods of artificial intelligence within the domain of Natural Language Processing. These methods are capable of investigating vast amounts of textual corpora formulated through human language (posts, news, articles, reports, books...) to extract complex quantitative information and relationships related to the objects discussed in the texts. In the realm of quantitative finance, these pieces of information and relationships have proven useful in complementing the findings resulting from traditional quantitative data analyses. In particular, they have been instrumental in advancing research in the realm of ESG finance, for which reliable datasets of appropriate length and frequency are not yet available. The purpose of the scholarship is as follows: - To conduct a written review of the main LLM models presented in the scientific literature for investigations of financial textual corpora; - To develop code in Matlab or Python for the implementation of some of these models; - To apply such code to financial textual datasets; - To compile a concise final report concerning the developed codes and the results derived from their application. It is emphasized that models and applications related to ESG finance will be strongly preferred.
	Tutor	Marco Corazza, Michele Costola
	Positions	2
	Requirements	Having successfully completed exams in mathematics, statistics, and quantitative finance. Possessing programming skills in Matlab and/or Python. All else being equal, documented knowledge of machine learning techniques is considered a preferred qualification.
	Starting date	By September
	Further information	The activities carried out within the scholarship can be considered for the completion of a master's thesis.

Code	internship project	**Female employment before and after childbirth, and early childcare service utilization: an analysis of the Italian case**
22	**Activity details**	The project aims at studying how childbirth affects women's employment, and at analyzing potential dynamics in the use of early childcare services (e.g. use of private or public childcare), with a particular attention to how these phenomena have changed over time. The analysis will be based on Italian data from the ISTAT Survey on Births, which is available for the years 2002, 2005 and 2012. The research assistant will provide support for an extensive literature review, and for the development of an empirical analysis which uses the software STATA. Previous knowledge, even basic, of this software is strongly recommended. The research conducted within the project might be used as basis for the Master thesis under the tutor's supervision.
	Tutor	Ylenia Brilli
	Positions	1
	Requirements	(i) Basic knowledge of STATA software; (ii) good knowledge of the English language; (iii) basic knowledge of the Italian language
	Starting date	June 2024
	Further information	

Code	internship project	**The determinants of longevity and its quality with special focus on mental health in older ages**
23	**Activity details**	The research project aims at documenting and analysing the determinants of longevity of its quality with a special focus on the mental health of older individuals and at the gender differences in mental health and longevity. The research assistant will provide support on a systematic literature review and a preliminary analysis of SHARE data and other questionnaires modules relevant to empirical analysis.
	Tutor	Agar Brugiavini
	Positions	1
	Requirements	Good knowledge of the English and Italian languages. Knowledge of Excel and STATA software (or similar software)
	Starting date	June 2024
	Further information	

Code	internship project	**Mapping Economic complexity of the local productive systems**
24	**Activity details**	The research aims to map the productive skills of the territories through the guided application of economic complexity models. The work consists of assistance in the analysis of the structure and production evolution at a sub-national level (regional, provincial, local labor system). The hypothesis is that the productive complexity of territories is a condition for increasing resilience to exogenous shocks and enhancing productivity growth in the long-run.
	Tutor	Giancarlo Corò
	Positions	2
	Requirements	Knowledge on STATA program and interest to study the main Istat and Eurostat data-base on local and regional economies
	Starting date	July 24
	Further information	

Code	internship project	Matching algorithms for Synthetic Control methods
25	**Activity details**	A recent article by Banal-Estanol et al. (2023) evaluates whether the UK's performance-based research funding system has improved the productivity of UK universities. In this project, we aim to test the robustness of this analysis using a different approach based on Data Envelopment Analysis (DEA) methods (Basso et al., 2018). The objective is to determine whether the introduction of the REF has improved the efficiency of UK universities compared to a benchmark sample of American universities. The analysis also aims to identify whether different types of universities have responded differently to the introduction of the REF and whether the efficiency gap between various types of universities (e.g., Russell Group and newer universities) has narrowed or widened.
	Tutor	Antonella Basso e Giulia Iori
	Positions	1
	Requirements	A good familiarity with a programming language, e.g. C, R, Python or Matlab, is required.
	Starting date	June 2024
	Further information	

Code	internship project	Intergenerational occupational mobility in Europe
26	**Activity details**	The aim is to analyze the intergenerational occupational mobility by comparing several European countries. The goal is to better understand how welfare systems and institutions may have influenced intergenerational occupational mobility. The research assistant will provide support on a systematic literature review and a preliminary analysis of SHARE data and other questionnaires modules relevant to empirical analysis.
	Tutor	Raluca Elena Buia
	Positions	1
	Requirements	Requirements: (i)Good knowledge of the English and Italian languages. (ii)Knowledge of Excel and STATA software (or similar software)
	Starting date	June 2024
	Further information	

Code	internship project	Modeling Flood Risk
27	**Activity details**	In theory, insurance holds the potential to play a crucial role in managing flood risk by distributing disaster risks across domestic and international insurance and capital markets. Beyond its fundamental risk-sharing function, there is a growing acknowledgment of the significant role insurance can play in encouraging policyholders or governmental entities to adopt measures that reduce the risk of disasters. However, the insurability of flood risk poses specific challenges, hindering the availability of affordable private insurance coverage for this peril in many countries. This has resulted in substantial increases in premiums for customers, low levels of insurance penetration, and considerable variation in penetration levels across countries. One major challenge lies in the technical difficulty of assessing exposure, the probability of occurrence, and potential losses due to flooding. Additionally, flood risk is influenced not only by the hazard itself but also by the population's ability to cope with flood events. In the face of a changing society and climate, insurers can no longer rely solely on historical claims experience to predict risk. The goal of this project is to review existing approaches to quantifying and modeling flood risks and to identify potential future directions for more effective risk assessment and risk-sharing arrangements. This involves exploring innovative methods such as Agent-Based Models, which simulate the dynamic evolution of flood risk and vulnerability by linking behavioral and physical models. It also includes leveraging AI-driven data approaches to

		quantify hazards, impacts, and risks induced by climate change, along with exploring proposals for peer-to-peer (P2P) alternatives for risk sharing. The specific focus of this project will be on insurance providers in Italy, a key player as one of the largest agricultural producers in the European Union with a distinct agricultural insurance market.
	Tutor	Antonella Basso e Giulia Iori
	Positions	1
	Requirements	A good familiarity with a programming language, e.g. C, R, Python or Matlab, is required.
	Starting date	June 2024
	Further information	

Code	**internship project**	**New Inequality measures at older ages**
28	**Activity details**	The project aims at deriving new indexes of inequalities in older ages. It makes use of micro-data and longitudinal data on socio-economic characteristics to develop indexes of inequalities based on several dimensions of life: income, permanent income and wealth. The research assistant will provide support on a systematic literature review and a preliminary analysis of SHARE data and other questionnaires modules relevant to empirical analysis.
	Tutor	Agar Brugiavini
	Positions	1
	Requirements	Good knowledge of the English and Italian languages. Knowledge of Excel and STATA software (or similar software)
	Starting date	June 2024
	Further information	

Code	**internship project**	**Innovative profiles of finacial advice**
29	**Activity details**	The candidate will deepen one or more profiles of interest in the field of financial advice. Modern financial advice is divided into different dimensions, financial, legal, quantitative, insurance. The candidate will be able to deepen the study by choosing to focus attention on the dimension that interests him most, with particular regard to the most innovative aspects of the subject, connected with the evolution of markets and financial instruments
	Tutor	Antonella Basso , Alberto Urbani
	Positions	1
	Requirements	Reserved to students enrolled at Economia e Finanza or Economics, Finance and Sustainability, or IMEF Master. Basic knowledge of both Italian and English Language
	Starting date	June 2024
	Further information	Assoreti

Code	**internship project**	**Natural resources, territorial sustainability and circular economy: methods for measuring the circular economy on regional basis**
30	**Activity details**	Reuse, recycling and repair are all opportunities to reduce resource depletion and benefit communities, given the increase in population, production costs and pollution, now of unsustainable levels. To guide and monitor an effective transition to a new approach to the economy and everything around it, an appropriate set of indicators should be used. Furthermore, the current lack of measurement systems at the regional level of Europe opens the interest towards the reconstruction of the cognitive framework at the different territorial levels through indicators (environmental, social,

		economic): they are necessary for identifying suitable sustainable strategies in a bottom-up perspective. The project follows on from the previous research project "Natural resources, territorial sustainability and circular economy" with reference to the circular economy. The research activity is developed in different steps: 1. investigation updating and analysis of the recent bibliography on natural resources and circular economy and construction of a summary scheme. 2. survey of databases and collection of existing data of natural resources in different territorial areas. 3. analysis of the methodologies and indicators proposed in the literature. 4. identification of new methods for processing the collected data and application hypotheses.
	Tutor	Paola Ferretti e M. Bruna Zolin
	Positions	1
	Requirements	Have passed at least one of the exams of the list: Optimization, Econometrics, Nonlinear Models and Financial Econometrics Advanced knowledge of Excel or knowledge of R/Matlab language and of territorial or primary sector issues. Having passed one of the following exams constitutes a preferential qualification: Commodity Markets, International Trade of Commodities.
	Starting date	June 2024
	Further information	

Code	**internship project**	**Sequential Monte Carlo and state-space models**
31	**Activity details**	Sequential Monte Carlo methods (a.k.a. particle filters) are inference methods based on sampling from an arbitrary posterior distribution nowadays used in many areas including DSGE model estimation in macroeconomics and volatility filtering in finace. The aims of the research are: to participate and provide organisational assistance to the World Meeting on Bayesian Analysis 1-7 July 2024 (https://www.unive.it/isba2024); to attend (attendance is free) one of the ISBA Short Courses, 1 July 2024 (https://www.unive.it/web/en/5492/programme#c48054). The meeting participation and the course attendance will be certified by the organising committee; to provide a review of methodological aspects and recent advances in SMC; to implement SMC in a programming language with application to state space models and time series analysis (forecasting realized volatility or forecasting macroeconomic variables with latent variable models); to write a final report where methods and results are presented and discussed. Keywords: Inference methods, Monte Carlo, time series, macroeconomics and finance. Further information: Nicolas Chopin and Omiros Papaspiliopoulos (2020). An introduction to Sequential Monte Carlo, Springer Verlag. https://nchopin.github.io/books.html. Casarin, R. and Marin, J.-M., (2009), Online data processing: Comparison of Bayesian regularized particle filters, Electronic Journal of Statistics, 3, 239-258. Casarin, R. and Marin, J.-M., (2009), Online data processing: Comparison of Bayesian regularized particle filters, Electronic Journal of Statistics, 3, 239-258. https://doi.org/10.1214/08-EJS256
	Tutor	Roberto Casarin, Stefano Tonellato
	Positions	3
	Requirements	High grades in statistics, econometrics and mathematics exams; statistical data analysis and R (or MATLAB and Python) programming skills may be useful
	Starting date	29/06/2024
	Further information	

Code	internship project	Quantifying Mortality in Catastrophic Events: A Multi-Source Dataset
32	**Activity details**	The goal of this project is to create a dataset that collects the number of deaths caused by wars, pandemics, and other catastrophic natural events for the G7 countries during the period 1750-2024. The aim is to assess whether these events have had a significant impact on the main macroeconomic and financial series of the countries considered.
	Tutor	Antonio Paradiso
	Positions	1
	Requirements	Proficiency in statistics and econometrics. Familiarity with Excel.
	Starting date	June 2024
	Further information	

Code	internship project	Systemic cooling poverty
33	**Activity details**	The activity includes research support for the quantification of the concept of systemic cooling poverty described in this article. Specifically, the scholarship holder will have to: contribute to the survey of literature in the field of vulnerability indicators, also with the support of AI; contribute to the survey of literature on the relationship between green areas and energy consumption, also with the support of AI; contribute to the analysis of a UNEP database of policies regarding the cooling of indoor environments through a simple descriptive analysis and the creation of graphs in R;
	Tutor	Enrica De Cian, Giacomo Falchetta (CMCC)
	Positions	1
	Requirements	Necessary requirements: Familiarity with R programming language; Familiarity with small sample statistics (descriptive, ANOVA analysis) in R or STATA; Familiarity with manual literature survey approaches. Preferential Requirements: Familiar with developing graphs and maps with R; Familiarity with manual and systematic literature survey approaches (with AI)
	Starting date	July 24
	Further information	