



PhD  
course  
in

# Quantitative methods for policy evaluation





## PRESENTATION

The evaluation of policies, plans, choices, at the institutional level – from micro/local to macro/ international - requires the mastering of quantitative methods, both ex-ante (building up scenarios of possible direct and indirect effects through calibrated general equilibrium models) and ex-post (through the use of counterfactuals on observational data). On the other hand the growing availability of new kind of information, to complement official statistics and survey data, requires the use of web data collection techniques, big data mining and machine learning also on complex data, such as the one used in social network analysis.

The PhD programme on Quantitative Methods for Policy Evaluation (hereinafter: QMPE), at the University of Macerata, is an innovative, international and interdisciplinary course designed for social science students interested in acquiring the necessary quantitative tools for policy evaluation, and for quantitative methods

student who want to learn how to apply them in the context of social issues and policy evaluation.

The applications range from the analysis of economic growth and distribution, to international trade and migration, from macro economic policies, to environmental, health, education, development and gender issues. Student's research topics bridging disciplines, and focus on atypical data such as historical and archive data, textual data, web data or firms' work flow data are particularly encouraged.

The candidates we are looking for are outstanding applicants whose aspiration is to undertake a higher education course inspired to the contamination of different fields of knowledge, to be educated and trained to become experts on data analysis and policy evaluation, capable of recommending decisions on scientific grounds by applying methods and models derived from an array of quantitative methods, including: dynamic systems, network

analysis, discrete choice models, multivariate statistical analysis, impact evaluations, causal inference, computable general equilibrium, machine learning, multi-sectoral modelling, and computational economics.

The University of Macerata and the QMPE PhD programme do not discriminate on the basis of (including but not limited to) national or ethnic origin, religion, gender or sexual orientation in administering its admission and education policies, financial aid and other school-administered programmes.

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## COURSE DATA

The QMPE PhD programme is organized around three curricula. The first one, Computable General Equilibrium Models and Multi-sectoral Analysis for Policy Evaluation (QMPE1) focuses on ex-ante analysis of potential policies; the second, Mathematical and Statistical Methods for Policy Evaluation (QMPE2) focused on dynamic systems, statistical methods and causal inference; the third, Nowcasting, big data, networks and web scraping (QMPE3), focuses on new data and new methods in policy evaluation. The three curricula are interconnected and students of one curriculum attend the courses offered by the other curricula.

Being grounded on methodology but strongly insisting on applications, the QMPE PhD programme offers, at the beginning of the academic year, introductory courses to the use and programming in Stata, R and Matlab. Follow-up and advanced courses are offered to second and third year PhD students. Students are trained in the

production of scientific research, targeted at academic outcomes and at institutional analysis and reporting. The use of replication exercises is a constant throughout the courses and curricula.

The acquisition of supplementary knowledge is promoted through the co-financing of Mooc courses offered by internationally recognized scholars and Universities.

All courses are taught in English by highly qualified Professors, including outstanding guests lecturers from major international universities and research centres. Moreover, the PhD students join an active research community of previous years students, junior and senior researchers and are asked to actively participate to regular seminars, organized by the Doctoral School or the University Departments involving academics of international reputation. Among the Institution and Universities recently involved in the activities of the QMPE PhD programme we can mention the RECSM at the Universitat Pompeu Fabra; the University of Groningen; the Isaac Newton Institute for Mathematical

Sciences in Cambridge; the Cepii in Paris; the Sorbonne University; the FAO; the Center for Nonlinear Dynamics in Economics and Finance in Amsterdam.

Six positions are available, including five positions with scholarships at standard Italian rates (EUR 15,300 per year; the amount is increased by 30% for training periods outside Italy) among which one is targeted to a specific research project financed by the Marche Region.

The PhD program is developed over three years:

- a first year of courses, seminars and exams common to all curricula and aimed at teaching advanced topics in quantitative methods.
- a second year of international research and training, mainly spent in international institutions associated to the Program (with an increase of 50% for the research scholarship amount).
- a third year of research activity for completing the PhD thesis.

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### SELECTION

Candidates will be admitted to the interview when a very good evaluation according to these criteria is achieved:

- a) evaluation of the master's degree's consistency with the PhD programme;
- b) evaluation of the CV;
- c) evaluation of the project statement's quality, creativity and impact;
- d) basic knowledge of calculus, statistics, programming and economic theory and policy;
- e) language proficiency

Interview will be conducted and assessed according to these criteria:

- a) discussion with the candidate on the CV;
- b) discussion with the candidate on the project statement's quality, creativity and impact;
- c) evaluation of knowledge of calculus, statistics, programming and economic theory and policy;

- d) English language proficiency as emerged during the interview;
- e) motivation.

### TARGET

The QMPE PhD is aimed at educating skilled researchers capable of applying their scholarly experience in professional environments where the scientific ability to address complex matters is needed. Although the natural destination of this programme is the academia, QMPE commits itself to train new generations of scholars whose analytical and critical skills are valuable also to local, national and international institutions, and NGOs. Our ultimate aspiration is to raise a class of researchers combining a top-notch scientific background with a strong engagement in dealing with present-day policy evaluations.

