

Department of Mathematics at the University of Bologna (UNIBO) has a vacancy for a talented and ambitious

PhD student (3 years)

on the subject of "Credit risk management and Jump models".

Job description

The research will be carried out in the context of the H2020 EU Marie Curie Initial Training Network project named "WAKEUPCALL", which will provide a unique opportunity, for 6 researchers in the early stages of their careers, to study cutting-edge research topics in the field of computational finance and risk management, under the prestigious scheme of Marie Curie European Industrial Doctorate (EID).

The aim of the WAKEUPCALL project is to deeper understand issues in financial risk management, and in the mathematical theory of pricing financial derivatives (and the related products).

In an EID project a close cooperation with the industry is mandatory, therefore a stay of 18 months with the industrial partner is expected and prescribed. For the current vacancy, the industrial partner is UnipolSai, one of the largest insurance companies in Europe.

The PhD candidate will join the WAKEUPCALL community, take part in the WAKEUPCALL events in Europe, and will develop his/her PhD research project over a four (year) time horizon.

The PhD student, under the supervision of Prof. Andrea Pascucci (UNIBO) and Dr. Marco Di Francesco (UnipolSai), will work on the development a digital library for the generation of scenarios for stochastic credit default models referring to a single entity, to multiples entities, and sovereign risk. Some innovative aspects include:

- Improve model for the dynamics of sovereign CDS and for the correlation between the sovereign CDS market (quoted in a foreign currency) and the sovereign bond market (quoted in domestic currency).
- Implementation of novel models of dependence between default events of multiple entities.
- Derivation of new closed-form formulas for the probability of survival of an entity, for the prices of plain vanilla call options on equity and for the prices of a default free zero-coupon within a single framework capable of reproducing market data.
- Introduction of stochastic dynamics for interest rates in an advanced stochastic model with jumps, which would be a considerable step forward with respect to the modeling of the credit risk of a single entity.

It is expected that the PhD student will work closely together with the industrial partner, UnipolSai, at any stage of her/his PhD.

Results are to be published in international journals and presented at major conferences, and they must lead to a PhD thesis within 3 years. At the end of the first year, the PhD student will be formally evaluated, to assess her/his ability of obtaining the PhD.

The PhD title will be granted by University of Bologna, upon a positive final defense of the PhD thesis.

Requirements

Potential candidates have a master degree in mathematics, physics, quantitative finance, econometrics, or computational sciences (with specialization in computational finance).

They have to be — at the date of recruitment — an “early stage researcher” , i.e. in the first four years of his/her research career and not have a doctoral degree.

They have a strong interest in financial mathematics and they are willing to further increase their knowledge of finance.

Preferred qualifications for candidates include excellent grades, research talent (as proven by the master thesis), affinity with the financial world and personal ambition. Particularly good grades in Financial Mathematics, (Applied) Probability, Statistics, Scientific Computing and Numerical Analysis are a strong plus.

Candidates are expected to have and prove an excellent command of English, together with good academic writing and presentation skills.

According to the regulations for mobility within the Marie Skłodowska Curie programme, at the time of recruitment by the host organisation, researchers must not have resided or carried out their main activity (work, studies, etc) in the country of their host organisation for more than 12 months in the 3 years immediately prior to the reference date.

Terms and conditions for the PhD Student

The terms of employment are in accordance with the Regulation on Research Fellowships pursuant to Italian Law no. 240/2010. The PhD student will be formally recruited by UNIBO with a full social security coverage, and s/he will have all the benefits provided for in the Marie Skłodowska Curie ITN fellowships regulations, including a highly competitive remuneration, living allowances and mobility expenses. As an Early Stage Researcher, the applicant will register to read for a PhD at the Department of Mathematics of Alma Mater Studiorum - Università di Bologna.

Financial provisions

The gross amount of the research fellowship contract is the sum of:

- a yearly living allowance which is a flat rate set out in the contract of about 39.800,00 euro par year obtained as a product of a flat rate times a correction coefficient;

- a monthly mobility allowance which is a flat rate of 600,00 euro par month.

For researcher with family charges will be paid a family allowance of 500,00 euro par month.

Application

Applications can be sent before 15 April 2015 to mat.direzione@unibo.it

The Envisaged Job Starting Date is October 2015.

Applications should include copy of a valid ID with photo, a detailed CV, a motivation letter, a list of MSc courses and grades (transcripts), a copy of the master thesis, and if available a list of publications.

For residents outside the EER-area, a Toefl English language test (or an alternative proof of knowledge) might be required.

For more information about the vacancy, please contact Prof. Andrea Pascucci, email andrea.pascucci@unibo.it

About Alma Mater Studiorum Università di Bologna - Department of Mathematics

UNIBO is one of the largest and most active Italian universities in research and technology transfer in Italy. It stands among the most important institutions of higher education in EU with more than 86,000 enrolled students, 3,185 Academic staff, 3,100 administrative staff units, 3,120 between research assistants, post-docs and PhDs.

At UNIBO, research activities are promoted, coordinated and supported autonomously by the 33 Scientific Departments.

The Department of Mathematics is responsible for research and teaching in the field of theoretical and applied mathematics, including Mathematical Finance.

The Department of Mathematics has infrastructures and administrative/technical staff for hosting and organizing Scientific Workshops and International Conferences.

The Mathematics Department offers a three-year PhD Program in Mathematics.

For more information, visit:

<http://www.mathematics.unibo.it/en>