



Talking Risk Management With Paul Embrechts, SFI senior chair at ETH Zurich

Paul Embrechts, professor of mathematics, talks to us about the importance of bringing together academics, practitioners, and regulators for a fruitful research discussion on risk management in finance and insurance.

Consistently ranked among the top institutes of technology in the world, ETH Zurich is the research home to many outstanding academics in disciplines ranging from chemistry to engineering. The department of mathematics is no exception and the research conducted on risk management has been among the most influential in the field.

I have an appointment with Paul Embrechts, who I meet in his office on the second floor of ETH Zurich's main building. Prof. Embrechts was appointed Full Professor of Mathematics in 1989. Since then, his classes have been very popular and are attended every semester by students across different curricula.

"The statistical methods we discuss in insurance and finance find application in many fields, such as energy and biomedics," he tells me.

In 2005, Prof. Embrechts and his co-authors Alexander McNeil and Rüdiger Frey published a book titled *Quantitative Risk Management: Concepts,*

Techniques, Tools. The textbook immediately gained popularity and is still today widely adopted at universities all over the world.

I ask him why he believes the book has been so successful since its release. In his opinion, the book covers a wide range of topics that were relevant both before and after the recent financial crisis.

"The book was published before the crisis, it lived throughout the crisis, and is no less relevant today as things are getting better," he tells me.

Though one cannot claim for sure that Prof. Embrechts and his co-authors were the first to use the expression "quantitative risk management", they were probably the first to coin another term that appears in the book: "insurance analytics".

Prof. Embrechts remembers when he gave a talk on extreme event modeling at the Wharton Business School in 1996. Till Guldimann, a JP Morgan executive and the father of Value-At-Risk (the measure most commonly used to assess market risk), was among the audience. One week later, Mr. Guldimann asked if he could use the slides for a lecture he was to give in Rome and if he could refer to that field as "insurance analytics".

In his role as professor of mathematics at ETH

Zurich, Prof. Embrechts is responsible for teaching and doing research on actuarial mathematics. He was officially appointed as the successor of Hans Bühlmann and his main duty was – and still is – to make sure that there is a full educational offer within the department of mathematics leading to the degree of actuary in Switzerland.

Since the beginning of his tenure, Prof. Embrechts combined actuarial mathematics with mathematical finance. He believes that risk management research in finance should employ more actuarial thinking, since actuaries are used to working with extreme events and know the methodology very well.

In 1994, he founded RiskLab, a research group focused on risk management topics. That was a year when the financial industry became increasingly interested in teaming up with academia, because of new capital adequacy rules for banks put forward by the Basel Committee for Banking Supervision.

The aim of RiskLab is to bring together academics, practitioners, and regulators, and to engage them in a fruitful research discussion. Indeed, research conducted at RiskLab is interdisciplinary and tackles issues of common interest to all three groups.

“It is not about merely exchanging proprietary tools

among each other,” he explains. “It is about discussing together common problems.”

Prof. Embrechts is directly involved within the finance and insurance industry. He was on the board of Bank Julius Baer for 11 years and of Swiss Life for eight years. He has also been a mathematical auditor for Swiss Re Life and Health for five years.

Prof. Embrechts talks consistently with regulators. In 2001, together with six prominent colleagues, he wrote a famous reply to Basel II. In their view, the Basel II proposals failed to address many of the key deficiencies of the global financial system, thus creating the potential for new sources of instability. The piece was written well before the finan-

RiskLab shares SFI's aim to engage academics, practitioners, and regulators in a fruitful research discussion.

cial crisis, yet was spot on in identifying the issues that would arise six years later.

In addition to his contacts with the industry and regulators, Prof. Embrechts knows fellow mathematicians in the best departments worldwide. He has developed this vast network of connections mostly through visiting professorship positions he held in some of

Short bio

Paul Embrechts is professor of mathematics at ETH Zurich and holds an SFI Senior Chair.

Prof. Embrechts pursued his undergraduate education at the University of Antwerp, Belgium, and obtained his PhD from the Catholic University of Leuven in 1979.

Together with Alexander McNeil and Rüdiger Frey, Prof. Embrechts is the author of *Quantitative Risk Management: Concepts, Techniques, Tools*, a textbook published in 2005 and widely adopted across the globe.

He held visiting positions at a number of prominent universities and gave keynote lectures at leading scientific conferences.

Last February, a symposium on risk management gathering Prof. Embrechts' co-authors and colleagues was held at ETH Zurich in occasion of his 60th birthday.

the world's most prestigious universities.

So does he see himself as a broker between different worlds? “I wouldn't use the word broker,” he replies. “I don't do brokerage deals – rather, I build bridges.”

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