

# South Africans present new method for financial markets at international conference

Two South African academics have pioneered a new numerical method that could help ensure greater efficiency and accuracy when pricing financial derivative instruments in markets worldwide. They will present their findings at the Global Derivatives Trading & Risk Management Conference, one of the world's leading finance conferences, which gets under way in Barcelona this week.



Tom McWalter

They are Professor Tom McWalter and his PhD student Ralph Rudd, who are based at the University of Cape Town's African Institute of Financial Markets and Risk Management (AIFMRM).

"It is an honour to be invited to this conference," says Professor David Taylor, director of AIFMRM. "It's one of the leading conferences on quantitative finance in the world and more than 500 practitioners and academics in the field will be there. This is the first time that a South African has been invited to speak at the event."

Quantitative finance is a field of applied mathematics pertaining to financial markets. Bankers, traders, analysts and other professionals use mathematical equations on a daily basis when trading and managing the risk of sophisticated financial products, such as derivative contracts. A derivative is a security with a value that is dependent upon or derived from one or more underlying assets, for example, stocks, bonds,

interest rates or commodities. They serve two main purposes: speculation on, or hedging of, investments. Financial mathematicians are often tasked with pricing such products.

Working in collaboration with Adjunct Associate Professor Jörg Kienitz (Bergische Universität Wuppertal) and Honorary Professor Eckhard Platen (University of Technology Sydney), McWalter and Rudd have developed a new numerical method that has been applied to pricing derivative products.

"There are a large range of complex derivative products in the market, and a vast array of numerical methods for pricing them," says Rudd. "We have extended one of these methods."

## More fields may benefit

Professor McWalter explains, "What we have been doing is to look at new numerical methods for computing solutions to complex equations, which, in this case, describe derivative contracts." The method they have developed is an improvement on previous methods and is under review for publication.

While their expertise can be described as niche, it is a very important one, says Professor Taylor. "It is a very general approach and there may be wider applications for it in physics, engineering or biology. One could even use it to solve the equations that govern the behaviour of a nuclear reactor."

Rudd, who is currently completing his PhD, says one of the advantages of their technique is that it is unique in the class of numerical methods. "Once you have applied the new method to your chosen model of the underlying asset, a large class of derivative contracts can be priced almost immediately."

Professor McWalter says that the method has the advantage of speed as well as accuracy. It is a sophisticated method to price complex contracts in a very efficient way.

“We expanded on work done two years ago, which was state-of-the-art then. We have found ways to improve the accuracy of that method. Then we also found ways to make the approach more widely applicable and robust.”

Professor Taylor says that the work McWalter, Rudd, Kienitz and Platen have done at AIFMRM is helping to put South Africa and Africa on the map when it comes to global finance. AIFMRM was founded in 2014 with the vision of establishing itself and UCT as a leading academic institution for financial markets and risk management across the continent. “Research like this helps us to attain our goal,” he concludes.



Ralph Rudd

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