

An Interview with Marcus Alexander Ong

Marcus Alexander Ong CMath MIMA CSci is CEO of Spectra Analytics. Marcus has just completed a PhD in Complexity Science with Finance having previously been a derivatives trader at Citigroup. When Marcus became a chartered mathematician, James Cheeseman AMIMA caught up with him for this interview.



What are you planning to do now after your PhD?

My original intention, having completed my PhD, was to move into the hedge fund industry. However, I have increasingly become a big believer in the power of data analytics to improve both businesses and broader society. To this end I have recently established Spectra Analytics, which is a boutique data analysis and research consultancy firm.

What made you interested in taking a PhD?

I'd always liked the idea of studying for a PhD but in truth I never thought it would happen. I've spent most of my professional life as a derivatives trader at Citigroup; which I absolutely loved. However, after the 2008 financial crisis, proprietary trading within banks – which is where you are trading on behalf of the bank using the bank's own capital – became less popular and later prohibited due to the introduction of the Volcker rule. Since I did not want to go back to market making – where you are trading on behalf of the bank's clients – and the hedge fund industry was struggling, I thought this could be a good opportunity to take some time out and go back to university.

Which university did you enrol at?

I had heard a lot of exciting things about Complexity Science and that there may be universal properties that govern many real world systems. I felt that this could provide an alternative approach to mainstream finance and economic research. Consequently I enrolled in the Complexity Science PhD programme at the University of Warwick.

How did you find going back to University after working?

Going back to university was a big change from trading in the City but one I would thoroughly recommend to anyone who has the opportunity. I have been exposed to a wide range of research and given the opportunity to develop my ideas which would have been difficult in the financial industry. I've also worked with some very talented people and made many new friends.

What is your thesis about?

Initially I was interested in how multi-fractality and anomalous diffusion may be used to price derivatives. However, as time progressed I developed a strong interest in machine learning and behavioural economics. My PhD research focussed on the Leverage Effect in equity markets. The Leverage Effect refers to the observed negative correlation between an asset's return and its volatility; first documented by Nobel laureate Fisher Black in 1976.

Despite a great deal of research over the decades there remains significant disagreement over its cause. I used information theory to support previous research on the importance of trading volumes for the stock-level Leverage Effect and provided a direct link to investor behaviour via Prospect Theory. I have also developed a stress-testing and derivative pricing methodology for portfolios using multivariate q -Gaussian distributions which better reflect the observed 'fat-tails'.

Tell me more about Spectra Analytics.

The firm was founded by myself and my colleague Daniel Sprague and is advised by the University of Warwick. The firm aims to bridge the gap between academia and industry to deliver cutting-edge, bespoke solutions to businesses across a broad range of industry sectors. The focus of the firm is on 'Big Information' as opposed to 'Big Data' which is currently in vogue.

What is the difference between 'Big Information' and 'Big Data'?

'Big Information' is the step beyond 'Big Data'. Just having a large amount of data isn't particularly useful. What organisations need is actionable analysis regardless of data size. To achieve this requires using the most appropriate and sometimes most sophisticated data analysis techniques currently being developed in academia. This is where the interdisciplinary nature of Complexity Science, with its focus on mathematical modelling and statistics, has the opportunity to revolutionise the area. To complement these skills the firm also has expertise in economics, finance, psychology, machine learning, pattern recognition, network theory, natural language processing and sentiment analysis.

Can you give me an example of where Big Information could be used in industry?

Data Analytics are being used across a wide range of industries in a plethora of ways. For instance, manufacturing companies are harnessing the power of data to optimise production and predict faults in their products. Law enforcement agencies are using data from multiple sources to infer connections between criminals. Supermarkets and other retailers are trying to understand our shopping habits so that they can conduct targeted marketing, offer us better deals and stock their outlets more efficiently. These are to name but a few examples. Other industries where data analytics play a prominent role include finance and insurance companies, healthcare providers and even sports teams. Unfortunately, many of these areas use simplistic or old-fashioned techniques, such as simple linear regression, which can lead to erroneous conclusions. Furthermore, these solutions are often not integrated across organisations so they do not use their data efficiently or effectively. These are all areas in which we could apply 'Big Information'.

James Cheeseman AMIMA
ECM Engagement Leader

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