Research Highlight: Jumps in equity index returns before and during the recent financial crisis

Work of Professor Steven KOU

There two interesting questions related to jumps in financial markets during and after the 2008-2009 financial crisis: (i) How did jumps in equity returns change after the 2008–2009 financial crisis—in particular, were there significant changes in jump rates or in jump sizes, or both? (ii) Can the performance of affine jump diffusion models be improved if jump sizes are larger, i.e., jumps with tails heavier than those of the normal distribution? Professor Steven Kou and his co-authors attempt to answer these two questions. For the second question, they find that a simple affine jump-diffusion model with both stochastic volatility and double-exponential jumps fits both the S&P 500 and the NASDAQ-100 daily returns from 1980 to 2013 well; the model outperforms existing ones (e.g., models with variance-gamma jumps or jumps in volatility) during the crisis and is at least comparable before the crisis. For the first question, on the basis of the model and the data sets, they observe that during the crisis, negative jump rate increased significantly, although there was little change in the average negative jump size.

Reference:

[1] **S.G. Kou**, C. Yu, and H. Zhong, “Jumps in equity index returns before and during the recent financial crisis: A Bayesian Analysis”. Management Science, 63 (2017): 998-1010.