Addressing Systemic Risk with Financial and Textual Data via a Gaussian Graphical Model

Paola Cerchiello *
paola.cerchiello@unipv.it

A very important and timely area of research in finance is systemic risk modelling, which concerns the estimation of the relationships between different financial institutions, with the aim of establishing which of them are more contagious/subject to contagion. The aim of this paper is to develop a systemic risk model which, differently from existing ones, employs not only the information contained in financial market prices, but also big data coming from financial tweets. From a methodological viewpoint, we propose a new framework, based on graphical Gaussian models, that can estimate systemic risks with stochastic network models based on two different sources: financial markets data and financial tweets, and suggest a way to combine them, using a Bayesian approach. From an applied viewpoint, we present the first systemic risk model based on big data, and show that such a model can help predicting the default probability of a bank, conditionally on the others.

This is joint work with Paolo Giudici and Giancarlo Nicola.

*Department of Economics and Management, University of Pavia, Via San Felice, 5, 27100 Pavia, ITALY