Systemic Risk and Network Contagion

Mr. Chen CHEN
PhD candidate
Columbia University

Date 6 March 2014 (Thursday)
Time 2:30pm (Tea/Coffee service at 2:15pm)
Venue B6619, 6/F, AC1

Abstract
Systemic risk is an issue of great concern in modern financial markets as well as, in the management of complex systems. We propose an axiomatic framework for systemic risk. Our framework allows for an independent specification of (1) a functional of the cross-sectional profile of outcomes across agents in the system in a single scenario of nature, and (2) a functional of the profile of aggregated outcomes across scenarios of nature. This general class of systemic risk measures captures many specific measures of systemic risk that have recently been proposed as special cases, and highlights their implicit assumptions. Moreover, the systemic risk measures that satisfy our conditions yield decentralized decompositions, i.e., the systemic risk can be decomposed into risk due to individual agents. Furthermore, one can associate a shadow price for systemic risk to each agent that correctly accounts for the externalities of the agent’s individual decision-making on the entire economy. In addition, we develop a structural model for the analysis of systemic risk in financial networks based on asset price contagion. Specifically, we describe a mechanism of contagion where exogenous random shocks to agents in an economy force portfolio rebalancing. This creates an endogenous chain reaction as agents trade in reaction to price changes. Our approach allows us to quantify the effect of attributes such as leverage and portfolio diversity on asset price contagion.
About the Speaker

Chen Chen is a PhD candidate in Operations Research at Columbia University. His research interests focus on risk management and design for complex systems. He has been working on various applications, including systemic risk measures, contagion effects in networks, auctions and mechanism design, and online economic systems. Before coming to Columbia, he attended Hong Kong University of Science and Technology and obtained a BSc degree in Physics (Physics and Math) and Computer Science. Also, he was a visiting student at Northwestern University.

Enquiry: 3442 8408

All are Welcome!