PAP Seminar Announcement

Date: 30 April 2013, Tuesday
Time: 10.00am to 11.00am
Venue: Hilbert Space (SPMS-PAP-02-02)
Host: Asst. Prof. Cheong Siew Ann

Title: Chained Financial Failures at Nation-wide Scale in Japan
Speaker: Prof. Yoshi Fujiwara, Graduate School of Simulation Studies, University of Hyogo, Japan

Abstract

I will talk about recent studies based on real data of propagation of financial failures in the past financial crises and the present one due to the earthquake at nation-wide scales in Japan. Leading credit research agencies in Tokyo and Nikkei have accumulated a huge amount of data on banks-firms and supplier-customer links with financial information and failures of nodes. By using these large-scale data, we measure the actually occurred propagation of financial distress on the real data of large-scale economic networks comprising of firms, banks, and their relationships at the order of millions and even more.

Exogenous shocks due to global financial crisis and mass destruction by disasters such as earthquakes cause propagation resulting in a sluggish relaxation, typically observed as an Omori-law.

Short Biography

He received his PhD from the Tokyo Institute of Technology in 1992 and studied general relativity and quantum cosmology at the Yukawa Institute as a postdoctoral fellow, and at the Institute of Theoretical Physics, University of California at Santa Barbara as visiting researcher. He has been engaged in the research of econophysics at the ATR, Kyoto as senior researcher and group leader, at the Kyoto University as adjunct lecturer, and also at the Department of Economics, Universita Politecnica delle Marche in Ancona as visiting researcher. He is advisory member of Credit Risk Database in Tokyo.

Title: Systemic Risk - DebtRank Analysis of Credit Networks in Japan
Speaker: Prof. Hideaki Aoyama, Graduate School of Sciences of Kyoto University, Japan

Abstract

In this work, we study a comprehensive Japanese economic network of banks and firms (nodes) with links representing the lending/borrowing relationships between the banks and the firms. We examine these relationships in order to identify key nodes in regard to the risk levels that they impose on the bank-firm system. By assigning some level of distress to a bank and letting the distress propagate to other nodes according to relative node exposures to the distressed bank, we find the level of threat that the bank poses to the entire system. We quantify the systemic importance of banks on one hand and firms on the other by the DebtRank centrality measure. Moreover, by combining DebtRank and Herfindahl index of distress distributions, we identify two categories of key banks: the large city banks with high impact on other banks, and small but important regional banks with large impact on the firms.

Short Biography

Dr. Hideaki Aoyama is a professor of theoretical physics at the Graduate School of Sciences of Kyoto University. He has held this position since 1998. Prof. Aoyama obtained his PhD in Physics at Caltech in 1982. He was a visiting scholar at Harvard University and a post-doctoral fellow and lecturer at Northeastern University from 1985 to 1988. He is the Scientific Advisor of the Credit Risk Database Association, and a faculty fellow of the Research Institute of Economy, Trade and Industry of Japan. He is co-author of the book: Econophysics and Companies –Statistical Life and Death in Complex Network, Cambridge University Press, (Cambridge, UK, 2010), and he has authored several other books on Econophysics in Japanese. Prof. Aoyama is the Principal Investigator for Kyoto University within the “Forecasting Financial Crises” project sponsored by the European Union.

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