



Cointegration analysis and influence rank----A cointegration-based financial network approach to global stock markets

Yanhua Chen*

University of Liverpool, Liverpool, United Kingdom – alisa000@163.com

In this work, in order to investigate the effect of the US sub-prime mortgage crisis and European debt crisis on 26 global stock markets integration, we propose a method based on cointegration instead of correlation to build financial networks in worldwide stock market. After the analysis on the structure of the directed, weighted and non-symmetric cointegration networks and the influence rank of each stock market by PageRank algorithm, some conclusions are drawn: the crises have changed cointegration relationships among global stock markets, their cointegration relationship increased after the Lehman Brothers collapse, while the degree of cointegration gradually decreased from the sub-prime mortgage crisis to European debt crisis. The influence of US, Japan and China market are entirely distinguished over different periods of crises. Before European debt crisis US stock market is a 'global factor' which leads the developed and emerging markets, while the influence of US stock market decreased evidently during the European debt crisis. Before sub-prime mortgage crisis, there is no significant evidence show that other stock markets co-move with China stock market, while it becomes more integrated with other markets during the periods of sub-prime crisis and European debt crisis. Among developed and emerging stock markets, the developed stock markets lead the world stock markets before European debt crisis, while due to the shock of sub-prime mortgage crisis and European debt crisis, their influences decreased and emerging stock markets replaced them to lead global stock markets.

Key Words: Financial complex network, cointegration, PageRank algorithm