

Multilayer spillover networks analysis of China's financial institutions based on variance decompositions

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We propose multilayer spillover networks, including return spillover, volatility spillover and extreme risk spillover networks, to investigate the connectedness across China's financial institutions during the period 2011-2018. The directional weighted network constructed on each layer is based on variance decompositions. We statically and dynamically analyze topological properties of each single-layer spillover network and multilayer spillover networks. We find that (i) the extreme risk spillover network can play an important role in early warning the financial stress due to its prompt response, (ii) although the importance rankings of financial institutions obtained from the three spillover networks show some correlations in the full-sample analysis, the correlations lose their statistical significance in the rolling-sample analysis, meaning that the relative rankings of institutional importance between different network layers may be irrelevant in short-term, but not necessarily in long-term, and (iii) the connectedness of each layer network shows a spike and its network structure becomes more complex when the system is in the financial stress.