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Community Structure of a Bank-Firm Credit Network in Japan[1]
HIROSHI IYETOMI, Department of Mathematics, Niigata University, YUKI MATSUURA, Graduate School of Science and Technology, Niigata University — We study temporal change of community structure in a Japanese credit network formed by banks and listed firms through their financial relations over the last 30 years. The credit connectedness is regarded as a potenital source of systemic risk. Our network is a bipartite graph consisting of two species of nodes connected with bidirectional links. The direction of links is identified with that of risk flows and their weights are relative credit/loan with respect to the targets. In a partial credit network obtained only with the links pointing from firms toward banks, the city banks forms one major community in most of the time period to share risk when firms go wrong. On the other hand, a partial network only with the links from banks toward firms is decomposed into communities of similar size each of which has its own city bank, reflecting the main-bank system in Japan. Finally we take overlapping parts of the two community sets to find cores of the risk concentration in the credit network.

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