

A Density-based Estimator of Core/Periphery Network Structures*

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Abstract

In this paper we propose a new estimator of core/periphery network structures. A new estimator is desirable because we show commonly-used estimators to be highly inaccurate when the density of the network is high relative to the true size of the core. Our density-based estimator is designed to overcome this problem and out-performs the commonly-used estimators in numerical simulations. These results have broad applicability to the network analysis literature.

We use our density-based estimator to analyse the Australian overnight interbank market, focusing on the 2007-08 financial crisis. Our results suggest that the crisis had a large and long-lasting impact on this market. In particular, we find that the typical core size fell from eight to five banks during the crisis, owing to large reductions in the lending/borrowing relationships of some non-major banks. The crisis also led to a substantial reduction in the core's exposure to the periphery, and an increase in the periphery's lending to the core (consistent with models of precautionary liquidity demand).

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