
HeiKaMEtrics-Seminar

Joint Heidelberg, Karlsruhe and Mannheim research seminar in Econometrics

Detecting Granular Time Series in Large Panels

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Abstract:

Large economic and financial panels often contain time series that influence the entire cross-section. We name such series granular. In this paper we introduce a panel data model that allows to formalize the notion of granular time series. We then propose a methodology to detect and test the set of granulars when such set is unknown that is inspired by the network literature in statistics and econometrics. The influence of the i -th series in the panel is measured by the norm of the i -th column of the inverse covariance matrix. We show that a detection procedure based on the column norms allows to consistently select granular series when the cross-section and time series dimensions are sufficiently large. Moreover, the asymptotic distribution of the column norms is derived in order to carry out hypothesis testing. Importantly, we show that the methodology allows to consistently detect granulars also when the series in the panel are influenced by common factors. A simulation study shows that the proposed procedures perform satisfactorily in finite samples. We illustrate the methodology with applications in macroeconomics and finance.