

Finite Sample Performance of Principal Components Estimators for Dynamic Factor Models: Asymptotic and Bootstrap Approximations*

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Abstract

This paper investigates the finite sample properties of the two-step estimators of dynamic factor models when unobservable common factors are estimated by the principal components methods in the first step. Effects of the number of individual series on the estimation of an autoregressive model of a common factor are investigated both by theoretical analysis and by a Monte Carlo simulation. When the number of the series is not sufficiently large relative to the number of time series observations, the autoregressive coefficient estimator of positively autocorrelated factor is biased downward and the bias is larger for a more persistent factor. In such a case, bootstrap procedures are effective in reducing the bias and bootstrap confidence intervals outperform naive asymptotic confidence intervals in terms of controlling the coverage probability.

Keywords: Bias Correction; Bootstrap; Dynamic Factor Model; Principal Components

JEL classification: C15; C53

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