Forecasting using principal components from many predictors

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September 2011

Abstract

This paper studies macroeconomic forecasting with many predictors, and primarily uses approximate dynamic factor models, in which a small number of latent factors summarize the information of predictors. Principal component analysis has been brought into widely use to estimate factors, and four kind of principal component (PC) estimators are examined in details, which are standard PCs, weighted PCs, generalized PCs and dynamic PCs. Furthermore, targeted PC estimation is proposed as another type of estimated factors in the paper, in order to take into account the purpose of forecasting variables of interest, which is accomplished by ordering PCs with their importance to prediction and selecting a handful targeted PCs. Then all these estimates are compared in the context of forecasting macroeconomic series at various time horizons, meanwhile other many-predictors forecasting methods are considered into the evaluation.The empirical data consists of 132 U.S. monthly time series available from 1969:1 to 2003:12. The results suggest that one or two estimated factors can valuably summarize the information from many predictors; however, forecasts are different and relative to variables of study.

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