統計科學研究所
INSTITUTE OF STATISTICAL SCIENCE

統計所學術演講　中研院統計所

學　術　演　講

講　題：Determination of the effective cointegration rank in high-dimensional time-series predictive regression

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時　間：2022年11月30日(星期三)，15:00-16:30

地　點：統計所B1演講廳

Abstract

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This paper proposes a new approach to identifying the effective cointegration rank in high-dimensional unit-root (HDUR) time series from a prediction perspective using reduced-rank regression. For a HDUR process xt ∈ R N and a stationary series yt ∈ R p of interest, our goal is to predict future values of yt using xt and lagged values of yt . The proposed framework consists of a two-step estimation procedure. First, the Principal Component Analysis (PCA) is used to identify all cointegrating vectors of xt . Second, the co-integrated stationary series are used as regressors, together with some lagged variables of yt , to predict yt . The estimated reduced rank is then defined as the effective coitegration rank of xt . Under the scenario that the autoregressive coefficient matrices are sparse (or of low-rank), we apply the Least Absolute Shrinkage and Selection Operator (LASSO) (or the reduced-rank techniques) to estimate the autoregressive coefficients when the dimension involved is high. Theoretical properties of the estimators are established under the assumptions that the dimensions p and N and the sample size T → ∞. Both simulated and real examples are used to illustrate the proposed framework, and the empirical application suggests that the proposed procedure fares well in predicting stock returns.

Keywords: Cointegration, Factor model, Reduced rank, High dimension, LASSO.

※ 英文演講，實體與線上視訊同步進行。　※ 茶 會：下午14：40開始。