

Sunspots, Iterative Two-Pass Cross-Sectional Regressions, and Asymptotic Principal Components

This paper considers two methods of estimating factor mimicking portfolios from asset returns: two-pass cross-sectional regression and asymptotic principal components. We show that, for a balanced panel of assets, iterating the two-pass cross-sectional regression converges to the same estimated factor portfolios regardless of the initial prespecified factors. Moreover, those estimates are equal to the Connor and Korajczyk (1986) asymptotic principal components (APC) estimates (again, within a linear transformation of rank k).

For unbalanced panels, identical MLE estimates (assuming normally distributed asset returns) are obtained from ITPCSR and an iterated version of APC. Again, the alternative estimates converge regardless of the initial factors chosen to start the ITPCSR. The estimates are quasi-MLE for actual return data since asset returns demonstrate non-normalities. In this case, we find evidence that the estimates can converge to different local maxima of the objective function.