LSTUR Regression Theory and the Instability of the Sample Correlation Coefficient between Financial Return Indices

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Abstract

It is well known that the sample correlation coefficient between many financial return indices exhibit substantial variation on any reasonable sampling window. This stylized fact contradicts a unit root model for the underlying processes in levels, as the statistic converges in probability to a constant under this modeling scheme. In this paper we establish asymptotic theory for regression in local stochastic unit root (LSTUR) variables. An empirical application reveals that the new theory explains very well the instability, in both sign and scale, of the sample correlation coefficient, between gold, oil and stock return price indices. In addition, we establish spurious regression theory for LSTUR variables, which generalizes the results known hitherto, as well as theory for balanced regression in this setting.