

A Control Chart Design for Monitoring
Autocorrelated Process with Multiple Exogenous Inputs
under Model Uncertainty

Ma. Sofia Criselda A. Poblador

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School of Statistics
University of the Philippines
Diliman, Quezon City

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Abstract

The AR-Sieve Bootstrap is proposed for the construction of a control chart of an autocorrelated process influenced by multiple exogenous inputs. The resulting control charts are compared with EWMA control chart through a simulation study. The AR-Sieve bootstrap control limits are narrower than EWMA control limits. While the proposed method yields a higher rate of false alarms, it is quick in detecting even minimal structural changes.

Keywords: AR-Sieve Bootstrap, control chart, model uncertainty, autocorrelated process, EWMA