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EWMA Chart and Measurement Error

PETROS E. MARAVELAKIS, JOHN PANARETOS AND
STELIOS PSARAKIS

Department of Statistics, Athens University of Economics and Business, Athens, Greece

ABSTRACT *Measurement error is a usually met distortion factor in real-world applications that influences the outcome of a process. In this paper, we examine the effect of measurement error on the ability of the EWMA control chart to detect out-of-control situations. The model used is the one involving linear covariates. We investigate the ability of the EWMA chart in the case of a shift in mean. The effect of taking multiple measurements on each sampled unit and the case of linearly increasing variance are also examined. We prove that, in the case of measurement error, the performance of the chart regarding the mean is significantly affected.*

KEY WORDS: Exponentially weighted moving average control chart, average run length, average time to signal, measurement error, Markov chain, statistical process control