

## Multi-Objective Economic-Statistical Design of EWMA Control Chart

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**Abstract.** EWMA Control charts are widely used for monitoring the quality of a process, especially in detecting small shifts. Their high implementation cost that may increase the cost of the production results in developing economic-statistical design of control charts with the lowest possible cost and more desired statistical properties. Lorenzen and Vance cost function is applied to design EWMA control charts considering both economic and statistical criteria. For this purpose, cost function is often optimized subjected to statistical properties. In most cases, cost function depends on statistical properties, so minimizing the cost function as a single objective is not efficient to design control charts. In this paper cost function and statistical properties including in-control and out-of-control average run length, are considered as objectives. We proposed multi-objective approach in which both economic and statistical criteria are optimized. A numerical example illustrates the efficiency of proposed approach comparing to single objective method.

**Keywords.** EWMA control chart, economic-statistical design, multi-objective, Lorenzen and Vance