

## **A Bivariate Dead band Process Adjustment Policy**

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### **ABSTRACT**

A bivariate extension to Box and Jenkins (1963) "machine tool" problem is presented in this paper. The model balances the fixed cost of making an adjustment, which is independent of the magnitude of the adjustment, with the cost of running the process off-target, which is assumed quadratic. It is assumed that two controllable factors are available to compensate for the deviations from target of two quality characteristics or responses. Analytical formulae are presented for the computation of the loss function that combines off-target and adjustment costs per time unit. This includes expressions for the average adjustment interval and the scaled mean square deviations from target. The optimization of the model and the practical use of the resulting "dead band" adjustment strategy is illustrated with an application to semiconductor manufacturing.