

Setting Lag Limits

(1) Find \hat{m} :

a) Set $K_N = 5$ and $c = 2$

b) $\hat{m} := \text{smallest integer s.t. } |\hat{\rho}(\hat{m} + k)| < c \sqrt{\log_{10} N / N}$, for $k \in \{1, \dots, K_N\}$,

where N is the sample size, and sample autocorrelation function, $\hat{\rho} = \frac{\hat{R}(k)}{\hat{R}(0)}$

(2) Set $M = 2\hat{m}$

Definition of $\hat{R}(k)$

$$\hat{R}(k) = \frac{1}{N} \sum_{i=1}^{N-|k|} (X_i - \bar{X}_N)(X_{i+|k|} - \bar{X}_N)$$

where, $k \in \{-M, \dots, M\}$

Definition of $\lambda(t)$

$$\lambda(t) = \begin{cases} 1; & |t| \in [0, 1/2] \\ 2(1 - |t|); & |t| \in [1/2, 1] \\ 0; & \text{else} \end{cases}$$

Calculate $\hat{g}(0)$

$$\hat{g}(0) = \sum_{k=-M}^M \lambda\left(k/M\right) \hat{R}(k)$$

Calculate \hat{D}_{CB}

$$\hat{D}_{CB} = \frac{4}{3} \hat{g}^2(0)$$

Calculate \hat{G}

$$\hat{G} = \sum_{k=-M}^M \lambda\left(k/M\right) |k| \hat{R}(k)$$

Calculate \hat{D}_{SB}

$$\hat{D}_{SB} = 2\hat{g}^2(0)$$

Calculate $\hat{b}_{opt,CB}$

$$\hat{b}_{opt,CB} = \left(\frac{2\hat{G}^2}{\hat{D}_{CB}} \right)^{1/3} N^{1/3}$$

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