Setting Lag Limits

(1) Find $\hat{m}$:

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

b) $\hat{m} :=$ 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 $\widehat{R}(k)$

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

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

Definition of $\lambda(t)$

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

Calculate $\hat{g}(0)$

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

Calculate $\widehat{D}_{CB}$

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

Calculate $\widehat{G}$

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

Calculate $\widehat{D}_{SB}$

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

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

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

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

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