Ch2: 1) proof strictly / weakly stationary

① strictly: $f(y_t, y_{t+1}, \ldots, y_{t+n}) = f(y_{t+k}, y_{t+k+1}, \ldots, y_{t+k+n})$

② weakly: ⓐ $E(y_t) = \text{constant}$

ⓑ $\gamma_k = Cov(y_t, y_{t+k})$ is independent to t

2) plot the time series

① ACF-plot ???

② 4-1 residual plot

3) difference operator: ① $\nabla^k = (1-B)^k$ ③ $\nabla_{12}^k = (1-B^{12})^k$

② $B^k y_t = y_{t-k}$

4) calculate MA; MM

5) proof: $\{Z_t\}$ is white noise $\begin{cases} ① E(Z_t) = 0 \\ ② Cov(Z_i, Z_j) = \begin{cases} 0 & i \neq j \\ \sigma^2 & i = j \end{cases} \end{cases}$

6) goodness of fit / forecast accuracy / test: MPE, MAD, MAPE

test uncorrelation: ($r = p = 0$): Σ-test / Bp-test / LB-test

指标: R^2 ↑

adj R^2 ↑ 大好/小好 ???

AIC ↓

BIC ↓

MSE ↓

ch3:

1) Derive Least square method

① simple: 复习高级 ch2, 从求导到展开 [如: $\begin{cases}\hat{\beta}_0 = \dots \\ \hat{\beta}_1 = \dots \\ ESSE = \dots = \sigma^2(n-p) \Rightarrow \frac{SSE}{n-p}\end{cases}$ is unbiased estimator of σ^2

② multi: $\begin{cases}OLS \\ GLS \to \text{"正"best"} \\ WLS \to \text{process}\end{cases}$ & $\begin{cases}\hat{\beta}_{OLS} = \\ \hat{\beta}_{GLS} = (X^T V^{-1} X)^{-1} \cdot X^T \cdot V^{-1} \cdot Y \\ \hat{\beta}_{WLS} = (X^T \cdot W X)^{-1} \cdot X^T \cdot W \cdot Y \quad (W = \sigma^2 \cdot V)^{-1}\end{cases}$

2) Test: $\begin{cases}① \text{ overall coefficient } (F) \\ ② \text{ individual } (t) \\ ③ \text{ residual 1-st positive auto correlation : DW test}\end{cases}$

3) C.I. ; P.I. 5

& 哪个比一点

PI 长