CAPM-FF

30 สิงหาคม 2561 8:03

Nested Models

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + u_i \quad (1)$$

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_4 X_{4i} + u_i \quad (2)$$

(1) & (2) are nested models.

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_5 X_{5i} + \beta_6 X_{6i} + u_i \quad (3)$$

(3) isn't nested to (1) & (2)

CAPM $$(r_j - r_f) = \alpha + \beta(r_m - r_f) + u_t$$

$$Y_t = \alpha + \beta_1 X_{1t} + u_t$$

FF $$(r_j - r_f) = \alpha + \beta_1 (r_m - r_f) + \beta_2 SMB + \beta_3 HML + u_t$$

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + u_t$$

Test CAPM vs FF

H_0 : $\beta_2 = \beta_3 = 0$ or (1) $\beta_2 = 0$ and (2) $\beta_3 = 0$

Residual SS

RSS

OLS ⇓ Min $\sum \hat{u}_t^2$

Unrestricted Model FF: RSS_{UR} $Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + u_t$ ($\beta_2 = 0$, $\beta_3 = 0$)

Restricted Model CAPM: RSS_R $Y_t = \alpha + \beta_1 X_{1t} + u_t$

$$\frac{RSS_R - RSS_{UR} / m}{RSS_{UR} / n-k} \sim F_{(m, n-k)}$$

$\sim \chi^2_{(m)}$ $m = 2$

$RSS_{UR}/n-k$ $\sim \chi^2_{(n-k)}$ $(m, n-k)$

UR FF $Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + u_t$

Overall Test $H_0: \beta_1 = \beta_2 = \beta_3 = 0$

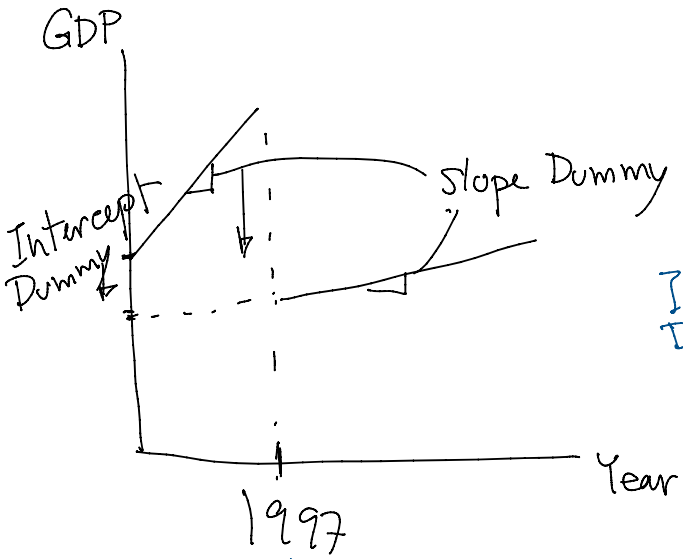
R $Y_t = \alpha + u_t$ RSS

$Y_t - \alpha = u_t$

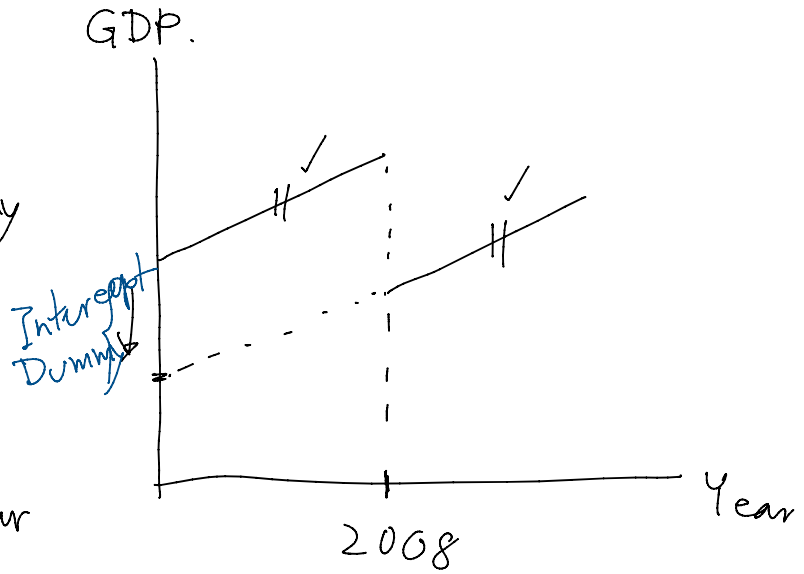
$TSS = \sum (Y_t - \bar{Y})^2 = \sum u_t^2$ TSS

$$F = \frac{RSS_R - RSS_{UR} / (m=3)}{RSS_{UR}/n-k} \quad (k-1)$$

$$\text{Overall} - F = \frac{ESS/k-1}{RSS/n-k}$$



Intercept Dummy & Slope Dummy



Intercept Dummy.

1997 or 2008 Sub-prime

1997 ⇒ Thai Economic Structure Change