Thursday, August 25, 2016 8:05 AM

CAPM — Restricted

$$(r_j - r_f)_t = \alpha_j + \beta_m (r_m - r_f)_t + u_t$$

$\sum \hat{u}_t^2 = RSS_R$

FF — Unrestricted

$$(r_j - r_f)_t = \alpha_j + \beta_m (r_m - r_f)_t + \beta_s SMB_t + \beta_h HML_t + u_t$$

($\beta_s = 0$, $\beta_h = 0$; RSS_{UR})

$H_0: \beta_s = \beta_h = 0$ — Null

$$F\text{-test} = \left(\frac{RSS_R - RSS_{UR} / m}{RSS_{UR} / n-k} \right) \sim F(m, n-k)$$

($m = 2$)

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

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + \beta_5 X_{5t} + u_t \quad (2)$$

$$Y_t = \beta_1 + \beta_2 X_{2t} + \beta_4 X_{4t} + \beta_5 X_{5t} + \beta_6 X_{6t} + \beta_7 X_{7t} + u_t \quad (3)$$

Unrestricted

⇓

Overall F-test

$H_0: \beta_2 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$

$Y_t = \beta_1 + u_t$ — Restricted.

$RSS_R = \sum \hat{u}_t^2 \Leftarrow \sum u_t^2 = \sum (Y_t - \bar{Y})^2 = TSS_{UR}$

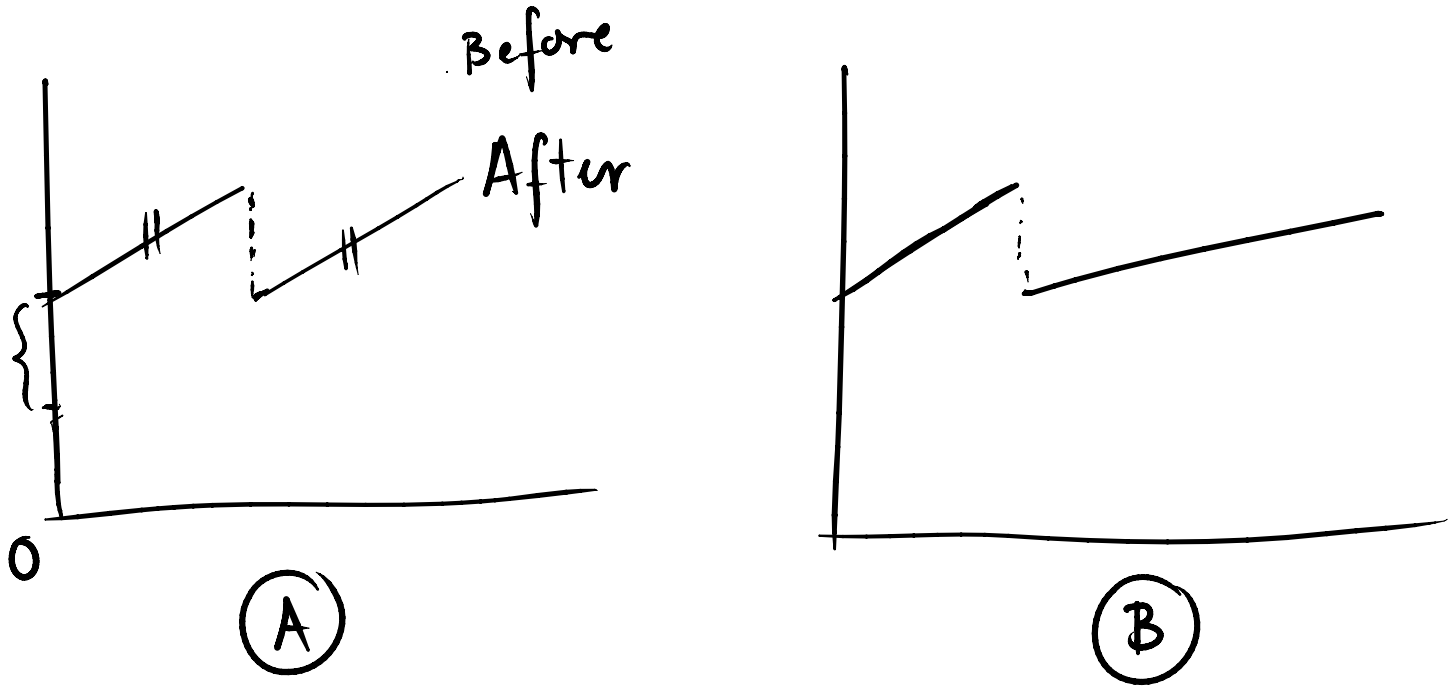
$$F\text{-test} = \frac{RSS_R - RSS_{UR} / m}{RSS_{UR} / n-k} = \frac{TSS - RSS / k-1}{RSS / n-k} = \frac{ESS / k-1}{RSS / n-k}$$

($m = k-1$)

Warning: reject H_0	True H_0 ($= 0$, No.)	False H_0 (Yes.)
	Type I	✓

reject H_0	✓	
Fail to reject H_0	✓	Type II

Intercept vs Slope Dummy



1997 Asian (Thai) Fin Crisis

Subprime or Euro Zone Crisis