Poole Review Questions

29/09/23

(maths workings)

2) $Y = \alpha - i + u \qquad \sigma_{\downarrow}^2 = \sigma_u^2$

$i = Y - M + v$

variance under i setting:

$var[Y] = var[\alpha - i + u]$

$var[Y] = var[u]$

α and i omitted due to being constants.

$var[Y] = \sigma^2$ //

variance under M setting:

$Y = \alpha - (Y - M + v) + u$

Substitute in LM into is?

$Y = \alpha - Y + M - v + u$

$2Y = \alpha + M - v + u$

$var[2Y] = var[\alpha + M - v + u]$

$2^2 var[Y] = var[u - v]$

α and M omitted due to being constants.

$4var[Y] = var[u] + var[v] \ldots$

$\ldots - 2cov[u, v]$

$cov[u, v] = \rho \times \sigma_u \times \sigma_v$

$cov[u, v] = -\sigma^2$

Sub into original

$4var[Y] = 2\sigma^2 - (-\sigma^2)$

$4var[Y] = 4\sigma^2$

$var[Y] = \sigma^2$ //