

Week 8 - 02424

ex1

Q1: Here we have only a random effect  
hence no fixed regressor but a random  
variable as regressor

$$Q2: E[Y|U] = U\theta$$

$$V[Y|U] = \sigma_\varepsilon^2$$

$$Q3: E[Y|U=u] = u\theta$$

$$V[Y|U=u] = \sigma_\varepsilon^2$$

$$\begin{aligned} Q4: E[Y] &= \int_{\Omega} E[Y|U=u] \cdot dF_U(u) \\ &= E[U]\theta \\ &= \mu_U \theta \end{aligned}$$

$$V[Y] = \sigma_U^2 \theta^2 + \sigma_\varepsilon^2$$

ex2: see solution