Econ 311: Labor Supply and the Two-Step Estimator
Revised Version

One period models

$$\max U(c,l) = \left(\frac{c^\alpha - 1}{\alpha}\right) + b\left(\frac{l^\phi - 1}{\phi}\right)$$
$$\text{st. } c + wl \le wT + A.$$

The Euler equation is $w = \dfrac{bl^{\phi-1}}{c^{\alpha-1}}$ and the

reservation wage is given by

$$w_r = \left[\frac{bl^{\phi-1}}{c^{\alpha-1}}\right]_{l=1,c=A} = \frac{b}{A^{\alpha-1}} \rightarrow \ln w_r$$

$$= \ln b + (1-\alpha)\ln A$$

Assume $\ln b = x\beta + e$, $e \perp\!\!\!\perp$(x,A,w), e

$\sim N(0, \sigma_e^2)$. Assume wages observed for

everyone

$$\Pr\left(\text{Person works} | X, A\right)$$

$$= \Pr(\ln w_r \leq \ln w | x, A)$$

$$= \Pr\left(\frac{e}{\sigma_e} \leq \frac{\ln w - x\beta - (1-\alpha)\ln A}{\sigma_e}\right)$$

$$= \Phi(c)$$

where $c = \dfrac{\ln w - x\beta - (1-\alpha)\ln A}{\sigma_e}$.

Grouped data estimator

Each cell has common values of w_i, x_i, A_i. For each cell, obtain $\hat{P}_i(D_i = 1 | w_i, x_i, A_i) =$ cell proportion working