Lecture 4: Labor Market Search

Economics 712, Fall 2014

1 Search Labor Model

1.1 McCall (1970) Model

Risk-neutral agent searches for job:

$$E_0 \sum_{t=0}^{\infty} \beta^t x_t$$

$x_t = w$ if employed, $x_t = z$ if unemployed

Job offers i.i.d. draw from $F(w)$.

Recursive formulation: state $s_t \in \{W, U\}$, control: accept, reject offer

Value of employed worker

$$\begin{aligned} W(w) &= E_0 \sum_{t=0}^{\infty} \beta^t x_t, \text{ s.t. } \ x_t = w \\ &= \frac{w}{1-\beta} \end{aligned}$$

Value of unemployed worker:

$$U = z + \beta \int_0^{\infty} \max_{acc,rej} \left\{ U, \frac{w}{1-\beta} \right\} dF(w)$$

Reservation wage w_R:

$$W(w_R) = U = \frac{w_R}{1-\beta}$$

Characterize reservation wage:

$$w_R - z = \frac{\beta}{1-\beta} \int_{w_R}^{\infty} (w - w_R) dF(w)$$

Another characterization:

$$w_R - z = \beta(E[w] - z) + \beta \int_0^{w_R} F(w) dw$$

Factors affecting reservation wage:

- value of unemployment z
- distribution of offers F

1.2 Adding Separations and Imperfect Job Finding

Population N_t, grows at n

Number of unemployed U_t, unemployment rate $u_t = U_t / N_t$.

job finding rate e, separation s

$$U_t = (1-e)U_{t-1} + s(N_{t-1} - U_{t-1})$$

or:

$$u_t = \frac{1-e-s}{1+n} u_{t-1} + \frac{s}{1+n}$$

steady state ("natural rate")

$$u^* = \frac{s}{n+e+s}$$

Now employed worker value:

$$\begin{aligned} W(w) &= w + \beta[sU + (1-s)W(w)] \\ &= \frac{w + \beta sU}{1 - \beta(1-s)} \end{aligned}$$

Unemployed worker finds job with probability p:

$$U = z + \beta p \int_0^\infty \max_{acc,rej} \{U, W(w)\}\, dF(w) + (1-p)U$$

Find reservation wage as before:

$$w_R - z = \frac{\beta p}{1 - \beta(1-s)} \int_{w_R}^\infty (w - w_R) dF(w)$$

Influence of separations, job offer probability

1.3 Determination of Unemployment Rate

Job finding probability:

$$p \int_{w_R}^\infty dF(w) = p(1 - F(w_R))$$

Job finding and loss balance:

$$up(1 - F(w_R)) = s(1-u)$$

Influence of z, p, s on unemployment rate (may differ from impact on w_R)