1 Search Labor Model

1.1 Adding Separations and Imperfect Job Finding

Now employed worker value:

\[ W(w) = w + \beta [sU + (1 - s)W(w)] \]

\[ = \frac{w + \beta sU}{1 - \beta (1 - s)} \]

Unemployed worker finds job with probability \( p \):

\[ U = z + \beta p \int \max_{acc, rej} \{ U, W(w) \} dF(w) + (1 - p)U \]

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

1.2 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 $w_R$)

2 Equilibrium Search Model


Continuous time, constant interest rate $r$.

Continuum $L$ of identical workers, risk neutral preferences:

$$\int_0^\infty e^{-rt}x\,dt$$

Endogenous number of firms, each with one job. Competitive producer of final good at price $p$.

Firms post vacancies, cost $c$ per unit time, $pc$ relative to output

$uL$ unemployed, $vL$ vacant jobs, $fL$ jobs filled, related by matching function $m$:

$$fL = m(uL, vL)$$

Assume $m$ increasing, concave, and has constant returns to scale, so $f = m(u, v)$.

Define $\theta = v/u$ then

$$q(\theta) = m(u/v, 1) = m(1/\theta, 1)$$

(Poisson) Rate at which vacant jobs are filled. Mean duration of vacancy = $1/q(\theta)$.

$\theta q(\theta)$ is rate at which unemployed workers find job, unemployment duration $1/(\theta q(\theta))$.

Properties:

$$q'(\theta) \leq 0$$

$$\frac{q'(\theta)}{q(\theta)} \theta \in [-1, 0]$$
Job creation when firm and worker meet, agree on wage. Jobs created:

\[ fL = Lm(u, v) = Lvm(u/v, 1) = Lu\theta q(\theta) \]

Creation rate:

\[ \frac{u\theta q(\theta)}{1 - u} \]

Jobs destroyed at exogenous Poisson rate \( s \). Total job destruction: \( s(1 - u)L \).

Evolution of unemployment:

\[ \dot{u} = s(1 - u) - u\theta q(\theta) \]

steady state:

\[ u = \frac{s}{s + \theta q(\theta)} \]

3 Firm Decision

Wage \( w \), hours fixed at 1, either party can freely break contract.

\( J \) value of filled job, \( V \) value of vacant job.

\[ rV = -pc + q(\theta)(J - V) \]

\[ rJ = p - w - sJ \]

So we have:

\[ J = \frac{p - w}{r + s} \]
Free entry of firms means $V = 0$. So we also have:

$$J = \frac{pc}{q(\theta)}$$

Equating gives the job creation condition:

$$p - w - (r + s) \frac{pc}{q(\theta)} = 0$$