Econ 714: Handout 1 [1]

1 Mortensen-Pissarides model

Compared to Pissarides, job destruction rate is endogenous. Each job has productivity px, where x is idiosyncratic. New x arrives at Poisson rate λ, drawn from distribution G on $[0,1]$. Initial draw is $x=1$.

Value of a job is now $J(x)$. If $J(x) \geq 0$) job kept, if $J(x) < 0$ destroyed. Reservation productivity R such that $J(R)=0$.

Job destruction rate: $\lambda G(R)(1-u)$. Job creation: $m(u,v) = \theta q(\theta) u$, where $\theta = v/u$ is market tightness. Unemployment flow: $\dot{u} = \lambda G(R)(1-u) - \theta q(\theta) u$

Steady state (Beveridge curve):

$$u = \frac{\lambda G(R)}{\lambda G(R) + \theta q(\theta)} \tag{BC}$$

Value functions for the firm:

$$rV = -pc + q(\theta)(J(1) - V) \tag{FV}$$

$$rJ(x) = px - w(x) + \lambda \left[\int_R^1 J(s) dG(s) - J(x) \right] \tag{FJ}$$

Value functions for the worker:

$$rU = z + \theta q(\theta)(W(1) - U) \tag{WU}$$

$$rW(x) = w(x) + \lambda \left[\int_R^1 W(s) dG(s) + G(R)U - W(x) \right] \tag{WW}$$

Worker's share of surplus (Nash bargaining):

$$W(x) - U = \beta [W(x) - U + J(x) - V] \tag{NB}$$

Zero profit: $V = 0$.
Exogenous variables: $\lambda, G, m, p, c, z, r, \beta$.
Endogenous variables: $R, \theta, u, v, w, V, J, U, W$.

1.1 Solving the model

1. Wage equation:
$$w(x) = z(1-\beta) + \beta p(x + c\theta) \tag{w}$$

2. Job creation:
$$(1-\beta)\frac{1-R}{r+\lambda} = \frac{c}{q(\theta)} \tag{JC}$$

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3. Job destruction:

$$\frac{\beta}{1-\beta}c\theta = R - z/p + \frac{\lambda}{r+\lambda}\int_R^1 (s-R)dG(s) \qquad \text{(JD)}$$

4. Solve (JC) and (JD) for R and θ, then use (BC) to solve for u and v.

2 Problem - McCall model[2]

Consider a variation on the basic sequential search model in which there is wage growth. Agents are risk neutral and seek to maximize:

$$E\sum_{t=0}^{\infty}\beta^t y_t \qquad (1)$$

where y_t is income in period t, which comes either from work or unemployment benefis, and $0 < \beta < 1$. Suppose that there are no separations and each unemployed worker is sure to receive an offer upon searching. If the wage offer is w in the first period, then the wage is $w_t = \phi^t w$ after t periods on the job, where $\phi > 1$ and $\phi\beta < 1$. The initial wage offer is drawn from a constant distribution $F(w)$. Unemployed workers earn a constant benefit of z.

1. Write down an unemployed worker's Bellman equation and characterize his optimal decision strategy.

2. Suppose that there are two economies $i = 1, 2$ that differ in their wage growth rates, with $\phi_1 > \phi_2$ (both ϕ_i still satisfy $1 < \phi_i < 1/\beta$). How do the decision strategies differ across economies?

[2] August 2012 macro prelim