

Labor Economics I
Midterm Examination
Fall 1996

Please answer all the questions and show all of your work. If you think a question is ambiguous, clearly state how you interpret it before providing an answer.

1. Each period an unemployed labor market participant receives a wage offer which is an i.i.d. [independent and identically distributed] draw from the wage offer distribution F with probability $\pi(e)$, $\pi(e) \in [0, 1]$, where e denotes search effort. If an unemployed individual receives an offer in period t and accepts it, s/he begins work on that job in period $t + 1$. The function π has the following characteristics:

$$\pi(0) = 0; \pi(1) = 1; \pi'(e) > 0; \pi''(e) < 0; \text{ for } e \in [0, 1].$$

An individual who is working faces a constant probability of being terminated in a period equal to $\alpha \in (0, 1)$. Individuals live a fixed number of periods, $T < \infty$. An individual searching in period t chooses a strategy to maximize

$$E \sum_{s=t}^T \beta^s y_s,$$

where β is the discount factor [taking values in $(0, 1)$] and

$$y_t = \begin{cases} w & \text{iff employed at wage } w \text{ in period } t \\ 1 - e & \text{iff searching and expending search effort } e \text{ in period } t \end{cases}$$

Note that an unemployed individual in her/his last period of life will not search.

- A. Characterize the optimal search strategy of an unemployed individual. In particular, is it characterized by a reservation wage rule? If so, does the reservation value in period t depend on the (optimal) level of search intensity, e_t^* ? Does it also depend on α ? [Hint: First consider the problem of an unemployed agent in period $T - 1$, and then try to work back from there; try to develop some intuition for what is going on.]

- B. List all the structural parameters of the model [some of these parameters can be functions]. Imagine you had access to a random sample of individuals from the homogeneous population described in this model. For each individual, you observed all their labor market movements over their entire life cycle $[1, T]$ and the wage paid at each job they had. Which of the structural parameters could be identified with such data?
 - C. What kind of life cycle patterns in unemployment, employment, and wage distributions does this model produce? Do they conform to observed patterns in actual labor market data?
2. Consider the following alternative specification of the matching model in Flinn (JPE, 1986). Let the log wage rate for individual i at firm j in period t be given by

$$\ln(w_{ijt}) = \eta_i + \theta_{ij}, \text{ for all } i, j, t.$$

Instead of assuming that each individual knows his or her value of θ_i prior to entering the labor market assume that it is unknown. Each agent's prior on η_i when first entering the labor market is given by a normal distribution with mean 0 and variance 1 [this is the population distribution of η]. The prior on each match-specific parameter θ_{ij} at the beginning of a match is also given by a normal random variable with mean 0 and variance δ [this is the population distribution of θ]. The individual only observes the sum $\eta_i + \theta_{ij}$ at each job j he or she samples.

- A. Characterize the learning process in this model.
 - B. Fully describe the agent's optimal turnover rule. In particular, does it have a critical value property?
 - C. Describe the implications of this model for observed turnover and wage dynamics.
3. Compare and contrast the equilibrium search models of (Albrecht and Axell) and (Burdett and Mortenson). In particular, discuss the assumptions each make with respect to population heterogeneity and the properties of the two classes of equilibria derived. Are the implications of the models consistent with empirical evidence on labor market and wage dynamics?