

Labor Economics I
Midterm Examination
Fall 1999

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. Each question has approximately the same weight.

1. Infinitely-lived, expected wealth-maximizing individuals have the opportunity to search [in continuous time] for job opportunities. Job offers are differentiated solely by the instantaneous wage (w). The instantaneous cost of searching is 0 and the discount rate is .1. For searchers, contacts with potential employers are made at the rate .4 (denote the contact rate by λ); contacts with potential employers only occur when the searcher is not employed [i.e., there is no on-the-job search]. The exogenous rate of the dissolution of jobs (η) is .1. Wage offers are i.i.d. draws from a uniform distribution on the unit interval, so that the probability density function of offers is given by $f_W(w) = 1$ for $w \in [0, 1]$.
 1. Find the reservation wage w^* . [It may be useful to know that $\sqrt{5}$ is approximately equal to 2.24.]
 2. Find the hazard rate from unemployment.
 3. Find the hazard rate from employment.
 4. Say that searchers receive unemployment benefits for the first 3 units of time during their initial search spell. Let $b = .3$ as long as $t < 3$, after which it reverts to 0. Describe the searcher's decision rule in this case in as much detail as possible. What are the implications of such an institution for the hazard rate from unemployment during the first search spell? What are the implications for the accepted wage distribution as a function of the time at which the job was accepted?
2. Compare the equilibrium search models of Burdett and Mortensen and Albrecht and Axell. In particular, discuss the properties of the models which account for the differences in the properties of the equilibrium wage offer distributions [discrete in Albrecht and Axell and absolutely continuous in Burdett and Mortensen]. Would it be possible for the Albrecht and Axell

model to be modified so as to produce a continuous equilibrium wage distribution? If so, how? Conclude by discussing the strengths and limitations of each model with respect to their usefulness as a basis for empirical work.

3. Let the wage realized by individual i who is employed at firm j in period t be

$$w_{ijt} = \mu_i + \theta_{ij} + \epsilon_{it},$$

where in the population of workers the distribution of μ , θ , and ϵ are independent normally distributed random variables with means of 0 and respective variances of σ_μ^2 , σ_θ^2 , and σ_ϵ^2 . Individuals are “forward-looking” infinitely-lived expected-wealth maximizers. In each period, an individual must decide whether or not to switch employment from his current employer [*firm j* let’s say], to a new one, firm j' . Under the following assumptions about the individual’s information and choice sets, formally describe (1) the rule he uses in determining whether to change employers; (2) the implications of the model for rates of turnover [job change, that is] over the life-cycle, and (3) implications for the distribution of wages over the life-cycle.

1. In period t the individual knows μ_i and θ_{ij} [which is his “match” value at his current firm. His choice is to stay at firm j in period t or to move to a new firm [j'] this period and get a new draw from the match distribution [the distribution of θ].
2. While working at firm j individual i never directly observes θ_{ij} . He is assumed to know the value μ_i , but only observes the *sum* $\theta_{ij} + \epsilon_{is}$ during each period s he has worked at firm j . If he worked at firm j in periods τ through $t - 1$ then his information set at the beginning of period t would be $\{\theta_{ij} + \epsilon_{i\tau}, \theta_{ij} + \epsilon_{i,\tau+1}, \dots, \theta_{ij} + \epsilon_{i,t-1}\}$. If he changes firms he will get a new draw from the match distribution.
3. Let $\sigma_\epsilon^2 = 0$, so that $w_{ijt} = \mu_i + \theta_{ij}$ given that the individual works at firm j in period t . At the beginning of period t individual i receives a competing wage offer from firm j' of $w_{ij't} = \mu_i + \theta_{ij'}$. When will he switch from firm j to firm j' ?