

Labor Economics I
Midterm Examination
Fall 1997

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. Infinitely-lived, expected wealth-maximizing individuals have the opportunity to search [in discrete time] for job opportunities. Job offers are characterized by the wage paid per period (w) and the probability that the job will be not be terminated at the beginning of the following period (π). The cost of getting a job offer is c . The discount factor is $\beta \in (0, 1)$. A searcher who pays the search cost in period t receives a wage offer at the end of that period and may begin work at the job in the following period if she accepts it. Denote the value of holding a job with wage w and continuation probability π by $V(w, \pi)$. [The worker holds such a job with certainty until the end of the period, at which time she may lose it with probability $1 - \pi$]. Denote the value of search by V_u . The value of nonparticipation is 0. Assume that the cost of search (c) is equal to 1. Let the discount factor be equal to .75. Assume the following population job offer distribution:

w	π	Probability
4	1	.5
5	.5	.5

- A. Characterize the optimal behavior of agents in this model. Do agents search? Which offers are acceptable? Be sure to provide a verbal discussion of your analysis in addition to the math [do as many explicit calculations as possible - I realize that you do not have access to a calculator].
- B. If search takes place, what kinds of life-cycle patterns in mobility would you expect to observe? Does the dismissal rate in the population go to zero as a cohort ages? What do you expect to observe in terms of the conditional distribution of wages given age?

2. An individual entering the labor market at time 1 is observed every 3 months. At each observation point, we determine whether or not he is employed, and if employed, what his current wage rate is. Denote the sequence of observations of the labor market history from period 1 through period S as (w_1, w_2, \dots, w_S) , where $w_s = 0$ if the individual is not employed in period s . Let the distribution of all the possible histories of the labor market process through period S be denoted by $F(w_1, \dots, w_S)$. Describe this distribution, or if you prefer the conditional distributions $F(w_s | w_1, \dots, w_{s-1})$, $s = 1, \dots, S$, in as much detail as possible, and at least in terms of the mean and variance, under the following models of the labor market. Assume that the underlying process is operating in discrete time also, with the same frequency as the sampling period (i.e., 3 months).
 - A. A model of unemployed search in which there is no on-the-job search. The population wage offer distribution is fixed as are all other structural parameters.
 - B. Same as in A, but with on-the-job search as well. All structural parameters are fixed and all wage offers are i.i.d. draws from a common distribution function.
 - C. A model of job matching, as described in Jovanovic or Flinn (in discrete time). All structural parameters are again fixed.

3. Consider the continuous-time search model developed and estimated in Flinn and Heckman (Journal of Econometrics, 1982). Discuss identification issues in that model when you have access to information on the length of employment and unemployment spells and accepted wage offers for a random sample of population spells and accepted wages. Discuss estimation of the identified model parameters both in the absence of measurement error in wages and in the presence of measurement error in wages.