

LABOR PRELIM

Spring, 1979

TIME: 4 HOURS. YOUR ANSWERS SHOULD BE AS COMPLETE AS POSSIBLE.

1. (20 minutes)

The world consists of two kinds of men, women lovers and women haters, and one kind of woman who is indifferent to men. Women lovers have a utility function like

$$U_L = U_L(X, W), \quad \frac{\partial U_L}{\partial X} > 0, \quad \frac{\partial U_L}{\partial W} > 0$$

where X is goods and W is the number of women with whom the individual works.

Women haters have a utility function like

$$U_H = U_H(X, W), \quad \frac{\partial U_H}{\partial X} > 0, \quad \frac{\partial U_H}{\partial W} < 0$$

Women have

$$U_W = U_W(X), \quad \frac{\partial U}{\partial X} > 0.$$

Males and females are equally productive and there are a large number of competitive firms bidding for labor. Describe the wage rates and the nature of employment segregation in competitive equilibrium.

2. (20 minutes)

Two empirical facts on earnings profiles appear to be well established. One is that earnings rise with total labor market experience. The other is that

earnings rise with tenure on a job. Discuss at least three conceptually distinct explanations for these phenomena and evaluate the explanations. How would you use data to discriminate among the explanations?

3. (40 minutes)

Imagine an economy in which production of a single good, x , takes place in various locations or "cities". Each city is characterized by an amount of a natural amenity, such as climate, labeled s , with s varying from city to city. Production of x is neoclassical with labor and land as factors of production and possibly with s as a shift factor. Each household is endowed with one unit of homogenous labor and has a standard utility function in x , land (a proxy for housing services) and the amenities. All firms have access to the same technology and all households have identical tastes. Land in each city is fixed and is to be split between production uses and household uses. All land is owned by absentee landlords in the middle east outside the country (balance of payments considerations are not to play a role in your answer). Both households and firms are perfectly mobile. Your main task is to describe the general equilibrium of production, consumption and location in this economy. The following steps may help.

- (i) Briefly, what general conditions and other things are you looking for to characterize an equilibrium? What is the role of the price mechanism?
- (ii) What conditions are required for equilibrium locations of households across cities? What conditions are required for equilibrium locations of firms across cities?
- (iii) What does (ii) imply about the relationship between wages and s across cities? Between land rentals and s across cities? Do wages and rentals increase, decrease, or remain unchanged with respect to s across cities? What

factors determine whether the effects of s appear only in rentals? Appear only in wages?

(iv) Will all locations be occupied? What determines this?

4. (30 minutes)

Consider the work-leisure decision. Individual i has a utility function of

$$U_i = X_i^{.5} \alpha_i L_i^{.5(1-\alpha_i)}$$

where X is goods, L is leisure, and α_i is distributed rectangularly on the interval $[0,1]$ over the population.

a. If the budget constraint is

$$P_X X = (24 - L) P_L + I$$

where P_X is the price of goods, P_L is the wage rate, and I is property income, what will the distribution of L look like over the population?

b. Now let there be a "negative income tax" system with the following characteristics: At total income $\leq I_0$, a subsidy of F dollars is provided. For every dollar earned until $2F$, 50% is subtracted. At some very high income level, R , the tax rate on additional earnings becomes 50% . What will the distribution of hours worked over the population look like?

5. (30 minutes)

Turnover rates decline with work experience on a job (Mincer, et al). Reservation wage rates decline with unemployment duration. These "facts" are "well known". Discuss the quality of the empirical evidence that supports these "facts", discuss potential sources of bias that can give rise to such

empirical regularities even if no economic model does, and discuss methods for avoiding the bias in order to test the economic model.

6. (30 minutes)

Friedman (1945) and Lillard (1979) write earnings (E) as a simple autoregression-moving average model. Friedman writes, for individual i ,

$$E_i(t) = \phi_i + U_i(t) + bU_i(t-1)$$

where ϕ_i is a permanent component and $U_i(t)$, $U_i(t-1)$ are iid innovations.

Lillard writes

$$E_i(t) = \phi_i + V_i(t)$$

where $V_i(t) = \rho V_i(t-1) + U_i(t)$

where $|\rho| < 1$, and $U_i(t)$ is iid, and stationarity in the process. Justify these models (with their implicit restrictions) using modern human capital theory (e.g., in terms of the models like the Ben Porath model).

7. (30 minutes)

Consider the following model of search. Unemployed workers receive wage offers in each period with the number of offers Poisson distributed with parameter α . Each wage offer, when received, is randomly sampled from the overall wage distribution. The wage offers carry with them expected (permanent) separation rates, σ , assumed to be the same for each job, so that duration on the job is exponentially distributed. Assume risk neutral workers. What is the reservation wage and optimal search strategy for the worker if the cost