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 pro-
duction 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
classify 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 in-
crease, decrease, or remain unchanged with respect to \(s\) across cities? What
4. (30 minutes)

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

$$U_i = X^{\alpha_i} L^{(1-\alpha_i)}$$

where X is goods, L is leisure, and $a_i$ 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. How large would a "negative income tax" system with the following characteristics be to total income $I_o$, a subsidy of F dollars is provided. For every dollar earned until 24, 20c is subtracted. At some very high income level, $N$, 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 (1954) and Lillard (1979) write earnings (E) as a simple auto regression-moving average model. Friedman writes, for individual i,

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

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

Lillard writes

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

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

where $|\rho| < 1$, and $E_i(t)$ 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 a. Each wage offer, when received, is randomly sampled from the overall wage distribution. The wage offers carry with them expected (permanent) separation rates, s, assumed to be the same for each job, as 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 wage