#26 PS

January 2003

Labor Economics Comprehensive Exam

Polachek/Wong

Part I

1. Prove 3 of the following 5 propositions:

a) that in the Ben-Porath (or if you wish the OSM) model the rate of decline of post-school investment is independent of w (the rental rate on human capital).

b) that a worker's post-school investment need not decline monitonically with age if the worker drops out of the labor force.

c) that the more time workers expect to drop out of the labor market the lower the "atrophy" rates of the jobs they choose.

d) that according to the Mincer specification, earnings dispersion increases if everyone in the population increases their schooling.

e) that firm isoprofit curves peak along the firm's labor demand curve

2. Very briefly indicate Isaac Erlich's innovation to incorporate health investment into the life cycle human capital maximization problem (Put simply, how does Ehrlich modify an individual's lifetime objective function, and how does he get health investment to increase late in life?)

3. (a) Why would twins data be used to better estimate rates of return to schooling than were estimated by Mincer and a host of others.

(b) Indicate whether studies using twins data have higher or lower rates of return to education.

(c) Cite studies using twins data.

4. Assume the following regression performed on female data:

$$W = 6000 + 300\,S + 100\,e - 50\,h$$

where
W = earnings in dollars per year,
S = years of school,
e = years of experience in the labor market, and
h = years out of the labor market (hometime).

a) Compute a gender discrimination coefficient assuming the following data on mean variable values for the population.

Variable	Males	Females
W	12,800	8,800
S	12	12
e	22	8
h	2	16

b) Is your discrimination coefficient biased upward or downward? Explain.

5. (a) Assume a corporate vice-president currently earning w_0 vies to become president of the corporation at a wage w_1. This vice-president can put out more effort (e) at a cost of D(e) such that $D(e) = e^2$. The probability of succeeding is $P(e) = ae$ indicating that success is proportional to effort. Prove that holding w_0 constant, effort expended to become corporate president increases with w_1.

(b) What evidence is there that effort expended is positively related to wage gain? Cite specific studies.

6. Answer ***FOUR*** of the following five True-False-Explain Questions: Indicate whether the statement is true, false or uncertain and explain why. Cite references where applicable.

a) Imposition of a minimum wage necessarily leads to a fall in employment.

b) During this century labor force participation of married women rose while their weekly hours declined.

c) The proportion of costs borne by the worker (relative to the proportion borne by the firm) for specific training exactly equals the proportion of benefits the worker obtains from the training.

d) Male-female wages are inherently understated because of innate selectivity biases.

e) Unions prefer to organize a monopolized industry rather than a competitive one.

Part II Answer all 3

1. During 70s and 80s we observed two patterns of wage inequality:

(i) education premium fell during 70s and rose during 80s,
(ii) within-group (education) inequality rose from 70s onwards

Use a simple model that can explain both trends.

2. Technical change could amplify the impact of changes in firms' organization structure on low-skill male wages. Demonstrate it with a simple model that utilizes a CES aggregate production function.

3. Consider two types of agents to be matched, male and female, denoted as m and f respectively. Agents are ex ante identical and discount future at rate r. But ex post match qualities differ. Let X denote the random-match quality of any pair, with a cumulative probability distribution denoted as F(x). Only unmatched agents search. Potential partners meet sequentially at random and at finite rates. Meetings are generated by a Poisson arrival process with the arrival rate λ. Assumed further that the fraction of single male equals that of single female, u, and so the random meeting rate with single agents is λu, and that with matched agents is $\lambda(1-u)$. While single, the benefit flow of an agent is b_i, $i = m$ or f. If the potential partner met is single, the capital gain is the agent's share of the surplus capital value of the match, S(x). If the potential partner met is matched, then the gain is the net surplus capital value of the new partner and the existing partner. A match is destroyed at an exogenous rate δ.

a. Suppose θ is the fraction of surplus obtained by female. Write down the expected present value of an existing match $W(x)$, the expected present value of being single for male, V_m, and for female, V_f, respectively.
b. .Derive the reservation match quality.
c. Solve for the steady-state fraction of singles.
d. Do self-interested decisions made by agents induce socially optimal level of single agents? Explain your answer.