

Second Midterm, Labor Economics, Fall 2006, Wiswall

Instructions: Write all answers on the separate answer sheet. Make sure you write your name on every page of your answer sheet. (78 total points)

Short Answer

Instructions: For each question, write a brief response on the separate answer sheet. Your answers should be concise and direct.

- 1) Using the concepts in the course, explain why lower oil prices could increase labor demand. (5 points)

- 2) Using the concepts discussed in lecture, explain three ways we could measure (in dollars) the utility individuals receive from Washington Square Park. (5 points)

- 3) Explain why credit constraints for human capital investment may be more severe for a child aged 2 than a high school graduate aged 18. (5 points)

- 4) Discuss one labor market friction which would prevent American firms from moving to the Chinese labor market. (5 points)

- 5) Explain why risk averse individuals would be less willing to attend college. (5 points)

- 6) Explain one advantage and one disadvantage for an employer to a tournament system of employee compensation. (5 points)

7) Assume we change our labor supply model to allow individuals to work at two jobs. Let h_1 and h_2 be the hours the individual works at job 1 and job 2, respectively. The wages of the two jobs are w_1 and w_2 . Write the new budget constraint. (5 points)

8) Explain why individuals would make all of their human capital investments when they are young. Discuss one reason why some individuals would make new human capital investments when they are older. (5 points)

9) Why is there a principal agent problem between workers and firms? Discuss why self-employment solves this principal agent problem. (5 points)

Problems

Instructions: For each problem, write your answer on the separate answer sheet. Show at least some work for each problem.

10) There are three periods: 1 (today), 2, and 3. Calculate the present value of utility for each of the following two streams of utility.

Stream 1:

$$u_1 = 1, u_2 = 1, u_3 = 1$$

Stream 2:

$$u_1 = 0, u_2 = 0, u_3 = 3$$

Assume the discount rate is $\delta = 0.5$.

Which of the two streams of utility provides the highest present value of utility? (7 points)

11) Consider the following table which displays the average fraction of 18 year old individuals attending college by family/parental income (low or high) and a test score measure of ability (low or high).

Fam. Income	Low Test Score	High Test Score
Low	0.1	0.7
High	0.2	0.8

Explain how the information in this table can be used to examine the extent to which individuals are credit constrained from attending college. (8 points)

12) Assume the firm has a production function of this form:

$$f(h, k) = 8h^{1/2}$$

a) Derive the optimal capital demand for this firm as a function of the wage rate w , the rental rate of capital r , and the output price p . (6 points)

b) Derive the optimal labor demand for this firm as a function of the wage rate w , the rental rate of capital r , and the output price p . (6 points)

c) Write the elasticity of labor demand with respect to the wage rate as a function of w , r , and p . (6 points)

Answers to Second Midterm, Labor Economics, Fall 2005,

Wiswall

1) Using the concepts in the course, explain why lower oil prices could increase labor demand. (5 points)

Oil is a an input into the production of many goods. If the price of oil declines, the cost of production is cheaper. Firms want to increase output and therefore demand more labor (a scale effect).

2) Using the concepts discussed in lecture, explain three ways we could measure (in dollars) the utility individuals receive from Washington Square Park. (5 points)

1) Put a wall up around the park and charge various fees to enter the park. We can measure the utility people receive from the park by measuring how many people are willing to pay fees of a given level.

2) Conduct a survey and ask people how much they value the park and how much they would be willing to pay to keep the park.

3) Use compensating differentials: Measure the difference in property values/apartment rents between those houses/apartments near the park and those not.

3) Explain why credit constraints for human capital investment may be more severe for a child aged 2 than a high school graduate aged 18. (5 points)

Future earnings of young children are more uncertain than the earnings of an 18 year old. Banks may be unwilling to offer loans for such risky assets or if they do, the interest on these loans would be prohibitively high.

4) Discuss one labor market friction which would prevent American firms from moving to the Chinese labor market. (5 points)

Possible frictions: cost of re-training workers, mobility costs of moving capital or purchasing new capital, cost of transporting goods back to the consumer market in the United States, costs of regulation and restrictions, etc.

5) Explain why risk averse individuals would be less willing to attend college. (5 points)

To the extent that college is a risky asset with uncertainty in both future labor market returns (college wages) and uncertainty in whether the individual will finish college, risk averse people may not want to expose themselves to this risk.

6) Explain one advantage and one disadvantage for an employer to a tournament system of employee compensation. (5 points)

Advantage: Creates incentives for effort among workers without having to increase their pay directly.

Disadvantage: May cause workers to sabotage each other since only relative performance, not absolute performance matters.

7) Assume we change our labor supply model to allow individuals to work at two jobs. Let h_1 and h_2 be the hours the individual works at job 1 and job 2, respectively. The wages of the two jobs are w_1 and w_2 . Write the new budget constraint. (5 points)

$$pc = h_1w_1 + h_2w_2 + V$$

8) Explain why individuals would make all of their human capital investments when they are young. Discuss one reason why some individuals would make new human capital investments when they are older. (5 points)

Individuals would make all of their investments when young because they would be able to receive a return from their human capital investments for a longer period of time.

Reasons why individuals would continue to make human capital investments throughout their lifetime:

- 1) Human capital depreciates
- 2) Tastes for schooling change over time
- 3) Return to human capital changes over time

9) Why is there a principal agent problem between workers and firms? Discuss why self-employment solves this principal agent problem. (5 points)

A principal agent problem exists because firms and workers have different

incentives: workers want high wages and low effort, firms want low wages and high effort. Self-employment solves this problem because if the worker and the firm are the same person there is not conflict.

10) There are three periods: 1 (today), 2, and 3. Calculate the present value of utility for the following two streams of utility in each of the periods:

Stream 1:

$$u_1 = 1, u_2 = 1, u_3 = 1$$

Stream 2:

$$u_1 = 0, u_2 = 0, u_3 = 3$$

Assume the discount rate is $\delta = 0.5$.

Which of the two streams of utility provides the highest present value of utility? Show. (7 points)

Present value of stream 1:

$$1 + 0.5 * 1 + 0.5^2 * 1 = 1 + 0.5 + 0.25 = 1.75$$

Present value of stream 2:

$$0 + 0.5 * 0 + 0.5^2 * 3 = 0.25 * 3 = 3/4$$

Stream 1 provides the highest present value of utility since $1.75 > 3/4$.

11) Consider the following table which displays the average fraction of 18 year old individuals attending college by family/parental income (low or high) and a test score measure of ability (low or high).

Fam. Income	Low Test Score	High Test Score
Low	0.1	0.7
High	0.2	0.8

Explain how the information in this table can be used to examine the extent to which individuals are credit constrained from attending college. (8 points)

One way to test for the presence of credit constraints is to see whether individuals of a given measured ability level with low income are less likely to attend college than individuals of the same ability level with high income. This table, indicate that high income individuals are more likely to attend college for both the low and high measured ability levels. This indicates that there are credit constraints, although the extent of these credit constraints may be less than looking at the unconditional difference in college going by income (i.e. ignoring ability levels).

12) Assume the firm has a production function of this form:

$$f(h, k) = 8h^{1/2}$$

a) Derive the optimal capital demand for this firm as a function of the wage rate w , the rental rate of capital r , and the output price p . (6 points)

$$MP_k = 0$$

Hence, $k^* = 0$.

b) Derive the optimal labor demand for this firm as a function of the wage rate w , the rental rate of capital r , and the output price p . (6 points)

From FOC

$$1/2 * 8ph^{-1/2} = w$$

$$4 * h^{-1/2} = \frac{w}{p}$$

$$h^{-1/2} = \frac{w}{p4}$$

$$h^* = \frac{p^2 4^2}{w^2} = \frac{16p^2}{w^2}$$

c) Write the elasticity of labor demand with respect to the wage rate as a function of w , r , and p . As in lecture, you can leave this as a function of h^* . (6 points)

$$\epsilon = \frac{\partial h^*}{\partial w} \frac{w}{h^*}$$

$$= 16(-2)p^2w^{-3}\frac{w}{h^*}$$

$$= -32p^2w^{-2}\frac{1}{h^*}$$