ECON 381 Final Exam

Prof. Krauth, Spring 2012

Please answer the question asked. You will be graded exclusively on your answer – you will receive no credit for extraneous information or almost getting it right and you will receive no penalty for failing to "show your work."

True, false or uncertain (5 points each, 40 points total)

For each of these statements please indicate whether the statement is true, false, or uncertain, and briefly (1-3 sentences should do) explain why. Your grade will depend primarily on the quality of your explanation.

1. We can determine whether the earnings of recent immigrants will converge to those of similar native-born workers by obtaining data from the most recent Census and estimating a linear regression of current earnings on years since entry.
2. Public sector workers in Canada earn a 5-10% premium over comparable private sector workers.
3. Competition from the private sector has no influence on public sector wages.
4. The only possible explanation for long-lasting inter-industry wage differentials is inter-industry skill differentials.
5. A finding that increased schooling raises a person's wage proves both the human capital hypothesis and the signalling hypothesis.
6. Outsourcing to foreign countries reduces the demand for domestic workers.
7. If leisure is a normal good, then workers will reduce their hours in response to an increase in the wage.
8. Generous transfer payments to poor Canadians can be made without creating a high implicit tax rate on labour income, but only if payments are also made to Canadians who are much less poor.

Problems (60 points total)

1. **(20 points)** Bob's Donuts is the monopsonist employer in a geographically isolated town in northern B.C. Bob produces 10 donuts per hour of labour employed ($Q = 10L$), and sells them to customers all over B.C. for $1 each ($P=1$). Assume that the donut market is competitive (or that demand for donuts is perfectly elastic) and that labour is the only input in the production process. The town's labour supply curve is:

$$w = 5 + 0.025L$$

   a. Find Bob's wage, quantity of labour demanded, and profits.
   b. Suppose that the government imposes a minimum wage of $11/hour. Will this increase employment, reduce employment, or leave it unchanged?

c. Suppose that the workers in the town unionize and credibly[1] threaten to withdraw all labour from Bob's Donuts unless he raises the wage to $9/hour. Will this increase employment, reduce employment, or leave it unchanged?

d. There are actually two types of workers, men and women. Men and women both produce 10 donuts per hour, but the labour supply curve for men is

$$w_m = 6 + 0.05L_m$$

and the labour supply curve for women is

$$w_f = 4 + 0.05L_f$$

Suppose that Bob is required by law to pay the same wage to men and women. Find the town's aggregate labour supply curve, where $w=w_m=w_f$, and $L=L_m+L_f$.

e. Assuming that Bob is required by law to pay the same wage to men and women, find the wage w, the quantity of labour supplied by men L_m, the quantity of labour supplied by women L_f, and Bob's profits π.

f. Now suppose that Bob can discriminate; i.e., he can pay different wages to women and men. Find the wage paid to men w_m, the wage paid to women w_f, the quantity of labour supplied by men L_m, the quantity of labour supplied by women L_f, and Bob's profits π.

g. Is discrimination profit-maximizing for Bob?

h. Suppose that other towns have competitive labour markets and so their donut factories pay $10/hour, but that it is quite costly to move. What do we expect will happen in the long run to (1) wages paid by Bob; (2) employment at Bob's Donuts; (3) the population in the town; and (4) the average age in the town? Explain why.

2. **(20 points)** In the first lecture I described the "ECON 103" model of labour markets. It assumed that homogeneous employers purchased individual hours of labour from homogeneous workers at a price (wage) that is equal to both the worker's opportunity cost (i.e., the labour supply curve) and the firm's marginal product of labour (i.e. the labour demand curve). However, we observe a number of labour market phenomena that are inconsistent with this simple model. For each observation below, describe a modification to the basic model that will explain the observation. Try to keep your explanation brief but clear.

   a. Immigrants have more rapid earnings growth than native-born workers with similar education and experience.

   b. Wages are higher for workers with more experience.

   c. Firms regularly pay workers more than their opportunity cost.

   d. A large proportion of workers work almost exactly 40 hours per week.

---

[1] A credible threat is one that everyone believes.

e. Firms engage in "labour hoarding": even when faced with long-term business downturns (think of a "downturn" as reduced demand for the firm's product) they do not always reduce wages or employment

f. Firms pay a substantial amount of compensation in the form of noncash benefits such as insurance.

3. **(20 points)** Suppose that young people are deciding whether to go to university. Young people are either rich (R) or poor (P), and either high-ability (H) or low-ability (L). Young people are equally distributed across the four possible categories: 25% are rich and high-ability, 25% are rich and low-ability, 25% are poor and high-ability, and 25% are poor and low-ability. Let N_{RH} be the proportion of rich and high-ability workers who obtain university degrees (e.g., if all rich and high-ability workers obtain degrees then $N_{RH}=1$) , and let N_{RL}, N_{PH}, and N_{PL} be defined similarly. Let $N_R=(N_{RH}+N_{RL})/2$ be the proportion of rich workers who obtain university degrees and let $N_P=(N_{PH}+N_{PL})/2$, $N_H=(N_{RH}+N_{PH})/2$, and $N_L=(N_{RL}+N_{PL})/2$ be defined similarly. Finally let

$$N = \frac{N_{RH} + N_{RL} + N_{PH} + N_{PL}}{4} = \frac{N_R + N_P}{2} = \frac{N_H + N_L}{2}$$

be the overall proportion of workers that are university educated.

The cost of obtaining a university degree (in present value terms, and including both direct costs and foregone earnings) is $C=\$50,000$. Rich young people have access to liquid assets[2] worth $A > C$, while poor young people have no assets. The demand for workers without a university education does not depend on ability and is perfectly elastic at annual wage $w_0 =\$30,000$. The demand for workers with a university education depends on ability, and is downward-sloping. Specifically the wage of university-educated high-ability workers is $w_H = w_0 + p_H - aN$, and the wage of university-educated low-ability workers is $w_L = w_0 + p_L - aN$, where $p_H = \$30,000$, $p_L = \$20,000$, and $a = 35,000$.

To keep things simple, we assume that wages do not change over the course of a person's life (the returns to experience are zero) and that a worker's career is long enough that the present value of lifetime earnings at wage w is w/r where $r=0.10$ is the market interest rate.

a. Find the highest value of N at which high-skilled workers will choose to obtain a university degree. (your answer should be a statement of the form "high skilled workers will choose to obtain a university degree as long as $N \leq$ *(some number that you need to calculate)*")

b. Find the highest value of N at which low-skilled workers will choose to obtain a university degree.

---

[2] In case you haven't seen the term in a previous course, liquid assets are just assets that can be freely exchanged for goods and services. For example, cash is a liquid asset while houses or factories are illiquid assets.

c. Suppose that young people can borrow as much as they like or lend as much as they like at the market interest rate. Find the proportion of young workers in each of the two ability categories that obtain a university degree (i.e., N_H and N_L) and the overall proportion of workers that obtain a university degree (N).

d. Now suppose that young people face borrowing constraints. That is, they can lend as much as they want at the market interest rate, but cannot borrow at any interest rate. Find the percentage of young workers in each of the four categories (N_{RH}, N_{RL}, N_{PH}, N_{PL}) that obtain a university degree, as well as the overall proportion of workers that obtain a university degree (N).

e. Assuming that the labour demand curves reflect the marginal product of labour, output per worker in this economy is:

$$APL = w_0 + \frac{p_H N_H}{2} + \frac{p_L N_L}{2} - \frac{a}{2} N^2$$

Use your results from (c) and (d) above to find APL with and without borrowing constraints.

f. Explain in a sentence or two why borrowing constraints have a negative impact on productivity.

g. Back in the real world (i.e., outside of this particular model with its various simplifying assumptions), an economist finds a positive correlation between parental income and university attendance, i.e., children of high-income parents are more likely to attend university than children of low-income parents. He argues that this is clear evidence that young people face borrowing constraints. Is this the case? Explain.

h. Back in the real world, an economist finds that a substantial tuition increase for medical school[3] in Ontario was followed by a large increase in the correlation between parental income and enrollment in medical school. He argues that this is clear evidence that young people considering medical school face borrowing constraints. Is this the case? Explain.

---

[3] An important thing to understand about medical school for this question is that the number of medical school positions is limited so that there is always excess demand that is rationed on the basis of GPA and test scores.