PhD Programme
Exam in Labor Economics
Date: 12 January 2015
Time: 12.30—17.30

Instructions

Answer the following questions on separate sheets of paper. If you think that a question is vaguely formulated, specify the conditions used for answering it. Each question is worth 20 points.

Question 1

a) Suppose you want to use as a classical labor supply function to model the choice to participate in the labor force. Explain potential problems with using a Mincerian wage equation without any corrections for selective samples to impute unobserved wages for those not employed in this context.

b) Explain briefly Heckman's two stage method for correction of bias from selective samples.

c) Explain the "worst case bounds" for the cumulative distribution function for wages in the Blundell et al. article "Changes in the Distribution of Male and Female Wages Accounting for Employment Composition Using Bounds" and indicate one way to make these bounds tighter by imposing a restriction.

Question 2

As researchers, we usually have less information concerning the productive abilities, Z, of individuals than workers and their employers have. Suppose these abilities both have a direct effect on productivity and an indirect effect working through education. That is, the productivity increase of getting an education is larger for those with high Z than for those with low Z. Further suppose that workers are being paid according to their productivity such that:

$W_0(Z) = Z$ are the earnings for those who do not educate themselves and

$W_1(Z) = a_0 + a_1 Z$ are the earnings for those who do get an education ($a_0 > 0$ and $a_1 > 1$) .

a) Given those assumptions, show and illustrate what the wage gap between those who get an education and those who do not get an education is.

b) Discuss the implications of the complementarity between ability and education when empirically estimating the returns to education.

c) Different studies use different strategies for dealing with the issues in b). If you were interested in what the returns would be to expand access to higher education, what would your ideal empirical experiment/s look like?

Question 3

Assume that production uses only low (*L*) and high (*H*) skilled labor and that the production function is CES as below, where *Y* is output, σ is the elasticity of substitution between *L* and *H*, and A_i is the degree of technological factor augmentation for each respective skill. Also assume that labor markets are competitive.

$$Y = \left[(A_L L)^{\frac{\sigma-1}{\sigma}} + (A_H H)^{\frac{\sigma-1}{\sigma}} \right]^{\frac{\sigma}{\sigma-1}}$$

a) Derive wages and relative wages (between high and low skilled labor) and show how these respond to changes in the ratio between *H* and *L*, A_i, and the skill bias of technology (A_H / A_L).

b) Show how you can move from this framework to the data, deriving a relationship between relative wages (the skill premium), skill supply and technological change.

c) Discuss to what extent this simple framework can account for changes in the US skill premium from approximately 1960 and onwards.

d) Explain briefly to what extent a “task assignment” model can account for the empirically observed changes.

Question 4

A way of thinking about active labor market programs is that they are investments in current time for a future increase in the employment probability. Consider the following partial equilibrium framework that models this idea in a simple fashion

The asset value of employment is given by

$$rW(w) = w + \lambda(U - W(w))$$

where w denotes the (exogenous) wage and λ the (exogenous) separation rate.

The asset value of unemployment is given by

$$rU = b + L(\mu, p) + \alpha(\mu, p) \int_{\underline{w}}^{\overline{w}} \max(W(w) - U, 0) dF(w)$$

where b denotes unemployment income, $L(\cdot)$ the value of leisure (or home production), $\alpha(\cdot)$ is the offer arrival rate, and $F(w)$ the exogenous wage offer distribution. μ denotes the probability of being assigned to a mandatory active labor market program which has intensity $p \geq 0$. Assume that

$$L(\mu, p) = [(1 - \mu) + \mu(1 - p)]L_0$$

$$\alpha(\mu, p) = (1 - \mu)\alpha_0 + \mu\alpha_1(p); \quad \alpha_1(0) = \alpha_0, \alpha_1'(p) \geq 0$$

a) Derive the reservation wage.

b) How does the reservation wage depend on μ? Explain the mechanisms.

c) What are the main results in Black et al (2003) (American Economic Review)? Discuss their results with the aid of this model.