PhD Programme
Exam in Labor Economics
Date: 21 August 2015
Time: 09.00—14.00

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

Two papers at the course reading list - Camerer et al. (1997) "Labor Supply of New York City Cabdrivers: One Day at a Time" *QJE* and Fehr and Goette (2007) "Do Workers Work More if Wages are High? Evidence from a Randomized Field Experiment" *AER* – are based on data from quasi experiments and experiments in order to obtain estimates of the labor supply wage elasticity. Describe these studies!

i. What type of elasticity do they aim to estimate? Why is it different from the wage elasticity in a static labor supply model?
ii. What type of data do they use and how does it affect their inference?
iii. What results do they obtain? What are the key differences?
iv. Describe Fehr and Goette's hypothesis on the role of risk aversion. How do they test it and what results do they get?

Question 2

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 3

Assume that a parent lives in one period in which s/he consumes (c), saves (s) and provides the child with education or not ($e = 1$ or $e = 0$). Also assume that the parent attaches equal weight to own consumption and the consumption of the child, i.e., household utility is given by: $\ln c_{ip} + \ln c_{ic}$, where c_{ip} is the consumption of parent while c_{ic} is the consumption of the child in family i. Further assume that the cost of getting an education differs between families and the cost amounts to ϕ_i. That costs differ between families can be seen as a proxy for family differences in the ability to study between families. In the second period, an educated worker earns w_s while an uneducated one earns w_u. Interest rates (discount rates) are equal to r.

a) Assume first that credit markets are perfect. Which families will invest in education for their children?
b) Now assume that parents make the investment decision on behalf of their children but also assume that parents cannot borrow against their child's future income. Set up the investment problem and derive the formal requirements for whom would get an education. In particular pay attention to whether or not credit constraints are binding or not.
c) Discuss the implications of this result.
d) What would you regard being the central empirical problem when trying to analyze the relevance of this model?

Question 4

Suppose that worker productivity (y) is determined by IQ and schooling (s):

$$y = \beta IQ + \gamma s$$

Schooling is observed at the time when a worker is first hired, but IQ is not.

True productivity is observed with error. Thus, observed productivity in each period (y_t^o) is given by

$$y_t^o = y + \epsilon_t$$

where the observation error is normally distributed with mean 0 and constant variance.

The labor market is competitive, and wages in each period equals expected productivity conditional on what has been observed up to that time point: $w_t = E_t(y|y_1^o, \dots, y_t^o, s)$. Employers use Bayesian updating to determine expected productivity. They have an initial prior about expected productivity; the initial prior is normal with mean $E_0(y|s)$ and a constant variance. With Bayesian updating, expected productivity at time t can be written as:

$$E_t(y|y_1^o, \dots, y_t^o, s) = \alpha_t \bar{y}_t^o + (1 - \alpha_t) E_0(y|s) \qquad (1)$$

where $\bar{y}_t^o$ is the mean of t draws from the observed productivity distribution.

a) The coefficient α_t in equation (1) varies with t. Explain intuitively how the coefficient α_t varies with t.
b) Derive an expression for the wage at the time of the initial hire.
c) Altonji and Pierret (2001) use data from the NLSY containing, inter alia, information on wages, years of schooling, IQ, and labor market experience. Set up a wage regression, where wages are related to the other three variables, in a way that is consistent with the above framework. What are the key predictions concerning the regressions coefficients in that regression? Explain.
d) To what extent are Altonji and Pierret's results consistent with the above framework? Give a brief account of their findings.