Final Exam ECON3715/4715 – Labour Economics
Autumn 2023

This exam has 5 questions, with 13 sub-questions. Each sub-question counts equally. When answering the questions on the exam you should be brief and to the point! Make sure to write clearly. Difficult to decipher answers will not be counted!

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1. Indicate whether you think the statement is true or false and explain why. You do not get any points if you only state whether the statement is true or false.

   (a) Under efficient bargaining between a firm and a labor union, the wage can be set above the value of marginal product of labor for the marginal worker.

   (b) In a perfectly discriminatory monopsony, the wage offered to a worker increases with the value of marginal product of labor generated by the worker.

   (c) In a firm with efficiency wages, an optimal wage must satisfy the condition that the elasticity of worker's effort with respect to the wage is equal to zero.

   (d) Under employer taste-based discrimination, the equilibrium wage of a negatively discriminated worker is always below the wage of a non-discriminated worker.

2. This question is about incentive pay. The output is given by $y = \mu + \varepsilon$, where μ is the worker's effort and random shock $\varepsilon \sim N(0, \sigma^2)$. The firm offers the worker a wage contract $w = s + by$, where s is a base salary and b is a piece rate. The worker is risk neutral and maximizes utility $U = w - c(\mu)$, where $c(\mu)$ is the cost of effort with $c'(\mu) > 0$ and $c''(\mu) > 0$. The firm determines (s, b) by maximizing expected profit $E[py - w]$ subject to worker's participation constraint $E[w - c(\mu)] \geq \bar{U}$, where p is fixed price per output unit, and $\bar{U}$ is worker's outside option. Worker decides whether to accept or reject the contract and an effort level if the contract is accepted.

   (a) Show that first-order conditions to the firm's problem imply $(p - c'(\mu))\,\frac{d\mu}{db} = 0$. Interpret this equation and explain why the optimal piece rate b^* is efficient.

(b) Assume the worker's cost function is $c(\mu) = \frac{c\mu^2}{2}$ where $c > 0$ and the worker is now risk averse and has a constant absolute risk aversion utility with expectation:

$$E[U] = E\left[-e^{-r(w-c(\mu))}\right] = -e^{-r\left[s+b\mu-\frac{rb^2\sigma^2}{2}-c(\mu)\right]}$$

where r is the worker's coefficient of absolute risk aversion. The firm's first-order conditions now imply $(p - c'(\mu))\frac{d\mu}{db} - r\sigma^2 b = 0$. Interpret this equation and discuss how this affects the worker's optimal choice of effort.

3. This question is about the structure of collective bargaining.

(a) Explain Figure 1 below that is taken from Moene, K. O. and M. Wallerstein (1997). Pay Inequality. *Journal of Labor Economics* 15(3): 403–430.

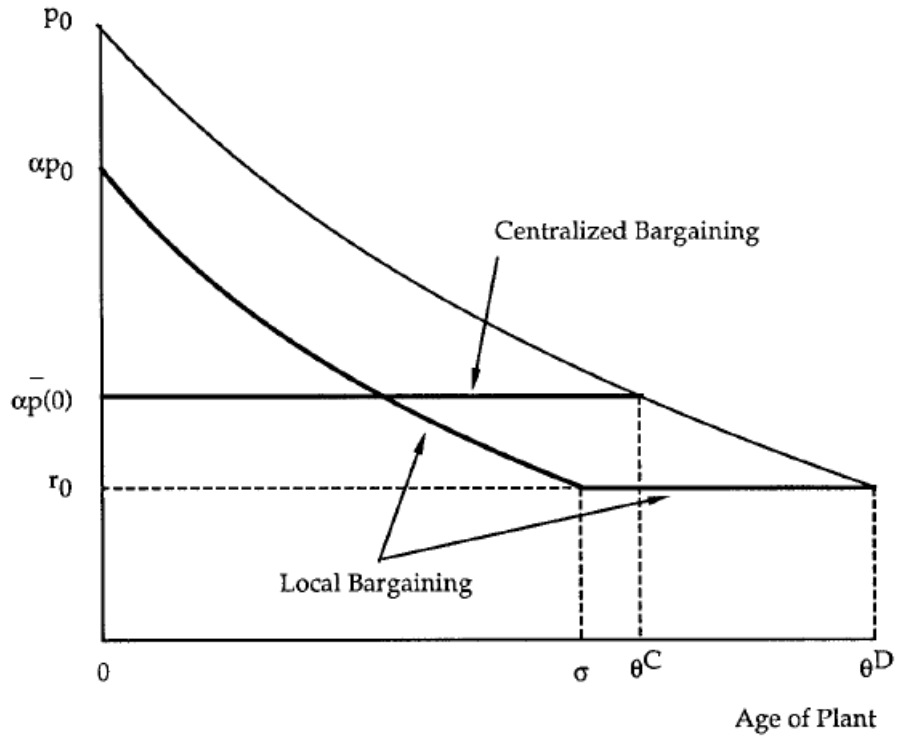

FIG. 1.—The distribution of wages across plants with local and centralized bargaining

(b) Imagine that there has been a gradual decentralization of the bargaining structure in the economy over time, where some industries have gone from a centralized to a local bargaining, while other industries continue to have a centralized bargaining (i.e., a standard wage rate). How would you test the predictions of the Moene and Wallerstein (1997) model? Explain the data requirements and the assumptions needed in your empirical strategy.

4. This question is about a signaling model of education. Bedard, K. (2001). Human Capital versus Signaling Models: University Access and High School Dropouts.

Journal of Political Economy 109(4): 749–775. The author presents a model with three education groups: high school dropouts, high school graduates and university graduates. Each individual is fully described by a single dimensional ability, θ. The author states that a separating equilibrium must satisfy the following conditions, where θ_h and θ_u are cutoff ability levels that are implicitly defined:

$$E(\theta|\theta < \theta_h) = \phi - C_h(\theta_h)$$
$$E(\theta|\theta > \theta_u) = \phi + C_u(\theta_u),$$

where ϕ is the expected wage of high school graduates, $E(\theta|\theta < \theta_h)$ is the expected wage of high school dropouts, $E(\theta|\theta > \theta_u)$ is the expected wage of university graduates, and $C_h(.)$ and $C_u(.)$ are the costs of high school and college, respectively.

(a) Explain the concept of a separating equilibrium in the signaling model of Bedard and explain what it means that the cutoff ability levels θ_h and θ_u are implictly defined by the conditions provided above.

(b) Imagine that the government implements a reform that leads to an easier access to university education. What will happen to the average wage of high school graduates and the share of high school graduates? Explain the mechanisms.

5. This question is about discrimination. Bartoš et. al. (2016). Attention Discrimination: Theory and Field Experiments with Monitoring Information Acquisition. *American Economic Review* 106(6): 1437–1475.

(a) Assume that, due to information asymmetry, profit-maximizing employers discriminate workers on an observable characteristic. Can this kind of discrimination persist in a competitive market with free entry and exit?

(b) Assume that there are two groups of workers, A and B, where the average productivity of group B is higher than that of group A and the productivity distributions across groups are otherwise identical. Assume that the average applicant is acceptable for an employer. As in Bartoš et. al. (2016) assume that information acquisition about an applicant is equally costly for the employer independent of applicant type. Which applicant group is the employer most likely to screen? Explain the intuition.

(c) Assume that you had observational data on job applications, worker characteristics and employer hiring decisions. In order to measure discrimination, why may you still prefer to run experiments with artificial applicants?