Final Exam ECON3715/4715 – Labour Economics
Autumn 2022

This exam has 4 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. In this question you have to 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) Suppose a worker's utility is a function of consumption and leisure, where leisure is a normal good. Then when wages increase, the worker will choose to enjoy more leisure.

   False/Uncertain. When a worker sees her wage increase, she experiences a substitution effect, an income effect, and an endowment effect:

$$\frac{\partial X_L^M}{\partial W} = \frac{\partial X_L^H}{\partial W} - \frac{\partial X_L^M}{\partial \bar{Y}} L^* + \frac{\partial X_L^M}{\partial \bar{Y}} \bar{H}$$

   The substitution effect is negative; a wage increase is like an increase in the price of leisure, so the worker will substitute away from leisure and toward work. Because leisure is a normal good, the income effect ($-\frac{\partial X_L^M}{\partial \bar{Y}} L^*$) is negative. However, for the same reason, the endowment effect ($\frac{\partial X_L^M}{\partial \bar{Y}} \bar{H}$) is positive.
   The worker will therefore only choose to enjoy more leisure in response to a wage increase if the endowment effect is large enough to more than offset the substitution and income effects.
   (Note: students may refer to $\frac{\partial X_L^M}{\partial \bar{Y}}(\bar{H} - L^*)$ as the income effect, in which case there is no separate endowment effect and the sign of the income effect is positive so long as one can't work more than one's time endowment).

   (b) A *perfectly discriminating monopsonist* will pay its more productive workers a higher wage.

False. A perfectly price discriminating monopsonist does not pay his workers based on their marginal productivity; he pays each worker exactly the amount necessary for that worker to be willing to take the job. We call that amount the worker's reservation wage, and it is not necessarily the case that the monopsonists' more productive workers will have higher reservation wages. That might be less likely to hold if workers have to move to a totally different industry (that relies on different skills) when opting not to work for the monopsonist.

(c) We can recover the value of the average worker's life from a hedonic wage function, by examining the wage premium associated with taking a job that has an increased risk of death.

False. The wage premium from a risk of death is set so that the *marginal* worker is willing to accept the risk. Setting aside the fact that we must extrapolate in order to infer the value of life from a marginal increase in the risk of death, that extrapolated value of life applies to the marginal worker who accepted it, not the average worker.

(d) Under a collective bargaining arrangement where firms and unions coordinate to leave the demand curve, any bundle on the contract curve is *strongly efficient*.

False. Generally, firms and unions bargaining on the contract curve will arrive at an inefficiently high level of employment, which can be enforced in practice through "featherbedding" contracts. Bundles on the contract curve are strongly efficient only if they do not distort employment away from the competitive equilibrium. Graphically, that occurs when the contract curve is a vertical line, or in the edge case where the union has no bargaining power and the resulting bundle is simply the competitive equilibrium.

(e) If Country A has a lower Gini coefficient than Country B, then the bottom 50 percent of earners in country A receive a larger share of national income than the bottom 50 percent of earners in Country B.

False/uncertain. The Gini coefficient provides a measure of "distance" from "equality" for *entire income distributions*: it compares a country's income distribution to the distribution we would expect to see under perfect income equality. Country A could have a smaller Gini coefficient not because it distributes more income to low-income households, but instead because it distributes income more evenly across high-income households.

2. This question is about Staiger D.O., J. Spetz, and C.S. Phibbs (2010). Is There Monopsony in the Labor market? Evidence from a Natural Experiment. *Journal of Labor Economics* 28(2): 211-236. In this paper, the authors consider a theoretical

model of "competition around a circle," where the labor quantity that hospital i can hire depends on the wage it sets (w_i) and the wages set by neighboring hospitals (w_{i-1} and w_{i+1}):

$$L_i = \alpha + \frac{1}{\tau}\left(w_i - \frac{w_{i-1} + w_{i+1}}{2}\right)$$

where α represents distance between hospitals and τ the travel cost per unit of distance for workers ($\alpha > 0, \tau > 0$). The marginal productivity of each nurse at a hospital is fixed at β, giving the "profit" function:

$$\pi(w_i) = L_i(\beta - w_i)$$

(a) In a symmetric equilibrium, where all hospitals set the same wage ($w_i = w_{i-1} = w_{i+1}$), it can be shown that the firm's profit maximization problem will yield the following expression for optimal wages w^*:

$$w^* = \beta - \tau\alpha$$

Suppose that local transportation investments make travel much easier, so that the cost of commuting to a more distant hospital (τ) falls. How does that affect w^*? Relate this to marginal productivity and hospitals' monopsony power.

As τ decreases, hospitals will pay their nurses more—a larger share of the nurses' marginal productivity (β). In other words, a decrease in the travel cost is reducing the monopsony power of hopsitals.

(b) In Table 2 of the paper, shown below, the authors report coefficient estimates from a regression of private hospitals' log wages on VA hospital log wages, where VA hospital wages are determined by policy rather than market forces:

Table 2
Reduced-Form Estimates of the Impact of VA Wage Changes on the Wage Changes in Non-VA Hospitals, 1990–92

Independent Variable	(1)	(2)	(3)	(4)
Change in log wage of RNs at the nearest VA (1990–92)	.128	.178	.137	.190
	(.033)	(.043)	(.077)	(.106)
Change in log wage of RNs at the nearest VA (1990–92) × dummy if > 15 miles to VA		−.078	−.105	−.139
		(.040)	(.042)	(.082)
Change in log wage of RNs at the nearest VA (1990–92) × dummy if > 30 miles to VA		−.049	−.035	−.100
		(.037)	(.056)	(.098)
Dummy if > 15 miles to VA				.008
				(.012)
Dummy if > 30 miles to VA				.013
				(.014)
MSA dummies?	No	No	Yes	Yes
R^2	.029	.044	.274	.276
No. of observations	1,179	1,179	1,179	1,179

Note.—Standard errors are in parentheses, clustered at the Metropolitan Statistical Area (MSA) level. Sample includes all non-VA hospitals within 60 miles of a VA hospital. Based on data from the American Hospital Association's Annual Survey of Hospitals and the Nursing Personnel Survey, 1990 and 1992, augmented with wage and employment information for VA hospitals from VA administrative data. All wages refer to starting (lowest) wages of RNs. Dependent variable = ln(wage92) − ln(wage90).

Interpret Row 1, Column 1 of Table 2 (where we see a coefficient of 0.128). What coefficient might we expect to see if the labor market was perfectly competitive (in other words, if hospitals faced perfectly elastic labor supply curves)?

This coefficient represents the elasticity of a private hosptital's wages to the wages of the nearest VA hospital: the private hospital is expected to increase its own wages by 0.128 percent in response to a 1 percent increase in the log wages at the nearest VA hospital. If the labor market were perfectly competitive, then all hospitals act as price-takers in the labor market and we should see no change in private hospitals' wages. An increase in wages at VA hospitals would just increase the surplus enjoyed by nurses at VA hospitals.

3. This question is about economic theories of discrimination. It relates to Bertrand and Mullainathan (2004). Are Emily and Greg more Employable Than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *The American Economic Review* 94(4) 991-1013. It also relates to Bartoš, Bauer, Chytilová, and Matejka (2016). Attention Discrimination: Theory and Field Experiments with Monitoring Information Acquisition. *The American Economic Review 106(6): 1437-1475.*

   (a) Distinguish the conceptual differences between taste-based discrimination and statistical discrimination.

An agent (worker, consumer, employee) discriminates based on tastes against workers of a particular type when the agent has direct preferences against interacting with that type of worker; the agent's utility payoff is reduced when interacting with that type of worker.
An agent may engage in statistical discrimination in a setting with imperfect information about worker productivity. In that case, a worker's type might be informative about their productivity, even after taking into account other observables (including ability tests).
In either case, the result is that otherwise similar, equally productive workers will receive different compensation based purely on their observable types.

(b) In Bertrand and Mullainathan (2004), the authors studied discriminatory behavior by comparing response rates from online job postings for fake resumes that had white-sounding names versus fake resumes with black-sounding names. Describe an identification problem that this experiment resolves (in other words, a problem we would face when comparing response rates for black versus white job applicants in real, non-experimental data).

This design addresses:
Selection bias - workers choose which jobs to apply for and which jobs to ignore. Other unobservable characteristics (such as place of residence), might be related to worker type and might also affect where workers choose to apply.
Omitted variables bias - workers may systematically differ across types in ways that matter to employers, but which researchers generally do not observe in data.

(c) Bertrand and Mullainathan (2004) also shows that listing a college education in one's job application significantly increases the odds of receiving a call-back for white-sounding names, but not black-sounding names. Discuss how a model of attention discrimination (such as the one laid out by Bartoš et al, 2016), can explain this result.

It may be the case that employers often did not even bother looking at applications from individuals with black-sounding names, in which case they never actually saw the differences across these applicants in their education levels. This could occur in a "cherry-picking" market, where employers are highly selective, so that employers expect to reject the average applicant.
When examining applications is costly under those circumstances, employers may choose to simply reject all applicants of a type that is perceived to be low quality. The employer does not expect that reviewing the application will be worth the time cost.

4. This question is about unemployment insurance, search effort, and moral hazard. Suppose a worker earns wage w but faces risk of job loss p. The worker can exert effort S to search for other jobs, to reduce the duration of unemployment (if job loss occurs). He receives Unemployment Insurance benefits b when unemployed, but must pay a wage tax τ. The worker's preferences are such that his expected utility is:

$$E[U(Y-M)|S,b,\tau] = (1-p)U(Y+w-\tau) + pU(Y+(1-S)b+Sw) - \psi(S)$$

Where U is concave such that the worker is *risk averse* ($U' > 0, U'' < 0$) and ψ is a convex cost function ($\psi' > 0$, $\psi'' > 0$). The Unemployment Insurance system is actuarially fair, so that b and τ are linked by the government's budget constraint:

$$(1-p)\tau = pb(1-S)$$

(a) Suppose a social planner has full control over S, b, and τ and is acting to maximize the worker's expected utility subject to the government's budget constraint. Describe the social planner's optimal ("first best") choices of b and τ. It may be helpful to take first order conditions with respect to b and/or τ. (Tip: it might also be convenient to write $c_e = Y + w - \tau$ and $c_u = Y + (1-S)b + Sw$)

Let $c_e = Y + w - \tau$ and $c_u = Y + (1-S)b + Sw$. Setting up the Lagrangian:

$$\max_{b,\tau,S}(1-p)U(c_e) + pU(c_u) - \psi(S) + \lambda\left((1-p)\tau - pb(1-S)\right)$$

and taking the two given FOCs:

$$[b] \quad pU'(c_u)(1-S) = \lambda p(1-S)$$

$$[\tau] \quad (1-p)U'(c_e)(-1) = \lambda(1-p)$$

Together, these conditions imply $U'(c_e) = U'(c_u) = \lambda$, which then implies $c_e = c_u$. Setting consumption equal in both states of the world requires setting $b = w - \frac{\tau}{1-S}$, and it corresponds to giving full insurance to the worker.

(b) Now suppose that the worker maximizes her expected utility by choosing S given some b and τ chosen by the social planner. How does the worker's chosen S differ from the social planner's "first best" choice of S? It may be helpful to compare the social planner's first order condition with respect to S to the worker's first order condition with respect to S.

The social planner's FOC with respect to S is:

$$[S] \quad pU'(c_u)(-b) + \lambda pb = \psi'(S)$$

The worker maximizes the same expected utility function, but without taking into account the government's budget constraint (the term attached to the Lagrangian multiplier in part (a)). As a result, her FOC is:

$$[S] \quad pU'(c_u)(-b) = \psi'(S)$$

So a wedge (characterized by λpb) exists between the worker's preferred S and the social planner's preferred S, reflecting the fact that only the social planner takes into account how a higher value of S reduces the cost of the unemployment insurance system, in turn allowing the worker to be subject to lower taxes.

(c) Gruber (1997) considers the "second best" allocation where a social planner optimally chooses b and τ, taking into account how these affect the worker's choice of search effort, S. He derives the following condition that should hold at the optimal b and τ:

$$\epsilon_{1-S^*,b} = U'(Y + (1 - S^*)b + S^*w) - U'(Y + w - \tau)$$

where S^* is the search effort level that the worker chooses for a given b and τ, and ϵ is the elasticity of *less* search effort $(1 - S^*)$ with respect to b. What does this expression imply about optimal UI benefits if search effort is *perfectly inelastic*? Relate this result to the social planner's incentive-insurance trade-off, when choosing generosity of Unemployment Insurance benefits.

If search effort is perfectly inelastic, then $\epsilon_{1-S^*,b} = 0$. In that case, then the social planner will choose full insurance ($0 = U'(c_u) - U'(c_e) \implies c_u = c_e$). Intuitively, the left hand side of the equation represents the moral hazard costs of increasing benefits, whereas the right hand side represents the insurance value that the worker derives from increasing benefits. When search effort is inelastic, there is no moral hazard cost and therefore no trade-off: the social planner can offer full insurance without distorting workers' behavior.