

Final Exam ECON4715- Labour economics

This exam has 6 questions, with in total 18 sub-questions.

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!

1. In this question you have to indicate whether you think the statement is true or false and explain why. You don't get any points if you only state whether the statement is true or false.

- (a) If a government would redistribute income from the richest quintile to the poorest quintile this would increase the Gini coefficient.

Solution.

- False.
- Area between Lorentz curve and 45 degree line can be used to measure degree of inequality

$$\text{Gini coefficient} = \frac{\text{Area between Lorentz Curve and } 45^\circ \text{ line}}{\text{Area below } 45^\circ \text{ line}}$$

- Gini coefficient of 0 represents perfect equality, while 1 implies perfect inequality.
- A redistribution of income from the richest quintile to the poorest quintile brings the Lorentz curve closer to the 45 degree line and decreases the Gini coefficient.

- (b) If a developed country increases the amount of trade with a less-developed country we expect that the skill wage differential increases in the developed country.

Solution:

- True
- It is likely that the developed country exports products developed by high-skilled labor and imports products developed by low-skilled workers.
- The increase in trade therefore increases the relative demand for skilled labor in the developed country. For a given relative supply of skilled labor the increase in relative demand will increase the skill-wage differential.

(c) Becker's model of taste-based discrimination predicts that employer discrimination is unlikely to persist in the long run.

Solution.

- True
- The Becker model of employer taste discrimination predicts that discrimination is unprofitable.
- Discriminatory firms are predicted to have lower profits because they hire the wrong type of workers (for example hire only white workers while black workers are cheaper), or because they hire the wrong number of workers.
- All because they perceive the price of minority workers to be higher than it really is due to a positive discrimination coefficient.
- In a perfectly competitive market with free entry & exit we expect that in the long run all discriminatory firms disappear because they have systematically lower profits than nondiscriminatory firms.

(d) Use the information in Table 1. If high-productivity workers obtain 9 years of schooling in order to signal they are high-productivity workers, this will result in a separating equilibrium where both type of workers are paid their present value of lifetime productivity.

Table 1. Productivity and cost of schooling for high- and low-productivity workers

Type of worker	Proportion of population	Present value of lifetime productivity	Cost of a year of schooling
low-productivity	0.60	500 000	30 000
high-productivity	0.40	800 000	20 000

- False
- In a separating equilibrium in which workers are paid their present value of lifetime productivity, it must be the case that high productivity workers obtain a number of years of schooling for which it is “unprofitable” for low-productivity workers to obtain the same number of years of schooling.

$$800000 - 20000 \cdot y \geq 500000 \longrightarrow y \leq 15$$

$$800000 - 30000 \cdot y < 500000 \longrightarrow y > 10$$

- If high productivity workers would obtain 9 years of schooling, low productivity workers would also obtain 9 years of schooling, but in that case we would not have a separating equilibrium. In a separating equilibrium high-productivity workers obtain $10 < y \leq 15$ years of schooling.

2. Becker's theory of general and specific training.

- (a) Explain how (and why) the worker and firm will divide the costs and benefits of general training

worker pays for, and receives benefits of general training. if the firm would pay for general training, the worker leaves for a higher paying job after getting the training, and the firm would not be able to recoup the investment. anticipating this the firm does not want to pay for general training. the worker pays for general training (possibly through a lower wage), and can recoup the benefits afterward because the market also rewards the general training.

- (b) Explain how (and why) the worker and firm will divide the costs and benefits of specific training

the firm pays for, and receives returns of training. since the worker would not be prepared to pay because she anticipates that she won't get the returns (the firm has no incentive to pay since the worker's outside option, the market wage, does not reflect the higher productivity).

3. Incentives.

- (a) Performance pay can change the productivity of the workforce in two ways. What are these?

1. more effort and 2. sorting (more productive workers)

- (b) Explain how upward-sloping age-earnings profiles can provide incentives to provide effort for workers.

upward-sloping age-earnings profiles pay the worker below marginal productivity in the beginning, and above marginal productivity in the future. in the beginning the worker has an incentive to provide effort because if the worker is caught shirking she loses her job and consequently the backloaded rewards.

- (c) The fact that "riskier" jobs have higher powered incentives is evidence against the principal agent model when workers are risk averse. Discuss.

This confounds compensating differential theory where risk averse workers need to be compensated with higher wages for taking risky jobs (in this case risk of injury), with agency theory where risk averse workers do not like to be exposed to risk (in this case uncertain payment), and therefore receive less high power incentives (the firm partially insures the worker).

4. This question is about: Hartzell, J. C., Parsons, C. A., & Yermack, D. L. (2010). Is a higher calling enough? Incentive compensation in the church. *Journal of Labor Economics*, 28(3), 509-539

(a) What are the two main research questions of the paper?

Is the performance pay Methodist ministers in Oklahoma receive consistent with agency theory? [6] In particular:

- i. incentives should be stronger when a task yields higher marginal returns to the agent's effort, and also when the agent incurs a lower marginal cost of supplying effort for each respective task. [+2]
- ii. in more risky settings where output is a poor signal of effort, firms should use less performance pay [+2]

(b) Explain how the paper tries to answer these research questions.

The paper checks the following

- i. is the pay for performance higher for easy conversions than for difficult conversions?
- ii. is pay tied less to performance in areas that are more economically volatile (and where membership is more volatile) because of oil prices

(c) What are the main results?

The authors interpret the results as being consistent with agency theory

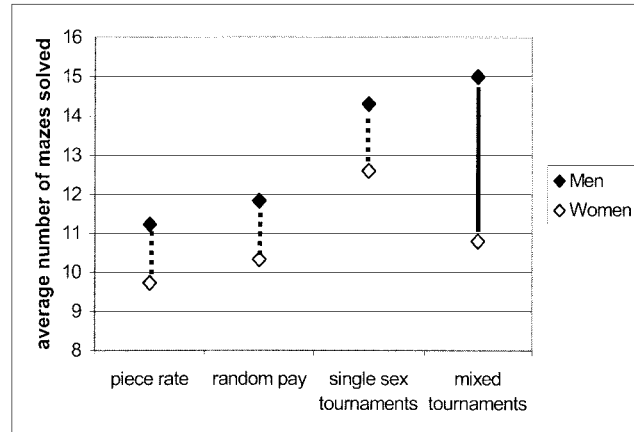
5. This question is about: Gneezy, U., Niederle, M., & Rustichini, A. (2003). Performance in competitive environments: Gender differences. *The Quarterly Journal of Economics*, 118(3), 1049-1074.

Gneezy et al. conducted a set of controlled laboratory experiments in which groups of 6 students were asked to perform the task of solving computerized mazes. There were 4 different treatments:

- Piece rate: individuals received 2 shekels for every maze solved.
- Mixed tournament (groups with men and women): only the participant who solved the most mazes received 12 shekels for every maze solved.
- Random Pay: only one participant, chosen at random, received 12 shekels for every maze solved.
- Single sex tournament: only the participant who solved the most mazes received 12 shekels for every maze solved.

Figure 1 shows results of the paper.

Figure 1. Results from Gneezy, Niederle and Rustichini (2003)



- (a) Use the results in Figure 1 to give an explanation for the observation that in many labor markets there are more men than women in high-ranking positions.

Solution:

If we compare the results in the piece rate treatment with the results in the mixed tournament treatment we see that men perform a lot better in the tournament treatment compared to the piece rate treatment while women's performance hardly differs between the two treatments, in addition we see that men outperform women in the tournament treatment. This experimental evidence supports an explanation for the observation that in many labor markets there are more men than women in high-ranking positions: women may be less effective than men in competitive environments, even if they are able to perform similarly in noncompetitive environments.

- (b) A researcher claims that women perform worse than men in the mixed tournament treatment, because they are more risk averse. On the basis of the results in Figure 1, do you agree with this researcher, explain why or why not.

The tournament design differs from the piece rate condition in two ways: payment is uncertain, and it depends on the performance of others. A possible explanation of the observed gender difference is that women are more risk averse, so that if effort is costly, the introduction of uncertainty into payments will affect men and women differently. The authors therefore introduce a third treatment, the random pay treatment which differs from the piece rate condition in only one way: payment is uncertain. The results show that risk aversion is unlikely to explain the fact that women perform worse than men in the mixed tournament treatment:

- The performance under the random pay treatment does not differ much from the performance under the piece rate condition
- The gender gap in the random pay treatment is a lot lower than in the mixed tournament treatment.

- (c) Another researcher claims that the results in Figure 1 show that women shy away from competition and that men compete too much. Do you agree with this researcher, explain why or why not.

The results show that women perform worse under the competitive tournament condition than men, but there is no treatment in which the participants are given a choice to enter a competitive or noncompetitive condition. The results are therefore not informative about the statement that women shy away from competition and that men compete too much.

6. This question is about: Esther Duflo (2001). Schooling and Labor Market Consequences of School Construction in Indonesia. American Economic Review 91 (September). 795-813.

Between 1973 and 1978, the Indonesian government engaged in one of the largest school construction programs on record. Duflo investigates the effect of this school construction program on years of education and wages. Table 2 shows results of the paper.

Table 2. Results from Duflo (2001)

EFFECT OF THE PROGRAM ON EDUCATION AND WAGES: COEFFICIENTS OF THE INTERACTIONS BETWEEN COHORT DUMMIES AND THE NUMBER OF SCHOOLS CONSTRUCTED PER 1,000 CHILDREN IN THE REGION OF BIRTH							
	Observations	Dependent variable					
		Years of education			Log(hourly wage)		
		(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: Experiment of Interest: Individuals Aged 2 to 6 or 12 to 17 in 1974</i>							
<i>(Youngest cohort: Individuals ages 2 to 6 in 1974)</i>							
Whole sample	78,470	0.124 (0.0250)	0.15 (0.0260)	0.188 (0.0289)			
Sample of wage earners	31,061	0.196 (0.0424)	0.199 (0.0429)	0.259 (0.0499)	0.0147 (0.00729)	0.0172 (0.00737)	0.0270 (0.00850)
<i>Panel B: Control Experiment: Individuals Aged 12 to 24 in 1974</i>							
<i>(Youngest cohort: Individuals ages 12 to 17 in 1974)</i>							
Whole sample	78,488	0.0093 (0.0260)	0.0176 (0.0271)	0.0075 (0.0297)			
Sample of wage earners	30,225	0.012 (0.0474)	0.024 (0.0481)	0.079 (0.0555)	0.0031 (0.00798)	0.00399 (0.00809)	0.0144 (0.00915)
<i>Control variables:</i>							
Year of birth*enrollment rate in 1971		No	Yes	Yes	No	Yes	Yes
Year of birth*water and sanitation program		No	No	Yes	No	No	Yes

Notes: All specifications include region of birth dummies, year of birth dummies, and interactions between the year of birth dummies and the number of children in the region of birth (in 1971). The number of observations listed applies to the specification in columns (1) and (4). Standard errors are in parentheses.

- (a) On the basis of human capital theory, what kind of effect of the program would you expect to find on the education and wages of those affected by the program? Explain your answer.

Under the program many new schools were constructed, thereby making it easier to enroll in school. In terms of human capital theory this program is expected to decrease the cost of investing in education, thereby increasing the net present value of the decision to invest in education. Human capital theory therefore predicts that the program increases the amount of education. Under human capital theory education increases productivity, the program is therefore expected to increase productivity and wages.

- (b) Interpret the result in column (3) - row (1) and compare it with the result in column (3) - row (3). Is there a difference in findings and if so how can we interpret this difference, is it what we would expect?

Panel A compares children aged 2 to 6 in 1974 with children aged 12 to 17 in 1974. Since the school construction took place between 1973 and 1978, children aged 2 to 6 in 1974 are affected while children aged 12-17 are not. Column (3)-row(1) shows the estimated coefficient on an interaction between program intensity (nr of constructed schools per 1000 children) and a dummy for the youngest cohort. The estimated coefficient equals 0.188 and can be interpreted as follows: one school built per 1,000 children increased the education of the children aged 2 to 6 in 1974 on average by 0.188 years. Panel B compares children aged 12 to 17 in 1974 with children aged 17 to 24 in 1974. Since the school construction took place between 1973 and 1978, neither of the two groups of children can be affected by the school construction program. Panel B provides a control experiment to test the common trend assumption. Column (3)-row(3) shows the estimated coefficient on an interaction between program intensity (nr of constructed schools per 1000 children) and a dummy for the youngest cohort. The estimated coefficient equals 0.0075 and is insignificantly different from zero. This results is as expected since children age 12 to 24 in 1974 cannot be affected by the program and the coefficient on the interaction term is therefore expected to be zero.

- (c) Duflo also estimates the returns to education. It is sometimes argued that returns to education are expected to be higher in developing countries than in developed countries. Give an explanation for why returns to education could be higher in a developing country.

A possible explanation for why we would expect higher returns to education in a developing country is that the relative supply of high individuals is low and for a given relative demand this creates a large skill-wage differential, and thus a high return to education. (other possible reasons include no minimum wages or other institutions that might lower the skill-wage differential).