Final Exam ECON4715 – Labour economics

This exam has 5 questions, with in total 17 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 do not get any points if you only state whether the statement is true or false.

   (a) A decline in the importance of unions is expected to increase the skill wage differential.

   Solution:

   - True
   - A weakening of bargaining power of unions can be interpreted as outward shift in relative demand curve.
   - mostly less skilled workers benefit from unions by receiving higher wages
   - without strong unions firms are willing to pay less for a given number of unskilled workers.
   - it is therefore expected that a decline in the importance of unions (for a given relative supply of workers) will increase the skill wage differential.

   (b) Statistical discrimination arises because employers get disutility from hiring minority workers.

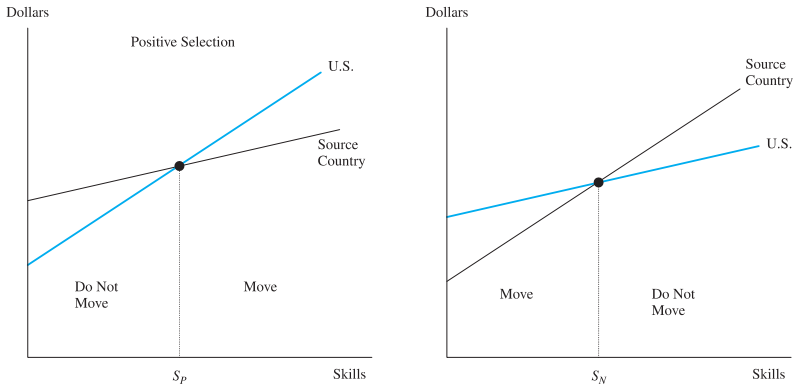
Solution.

- False
- **Statistical discrimination** arises because employers use statistics about the average performance of the group to predict a worker's productivity.
- In contrast (employer) taste-based discrimination arises because employers are prejudiced and get disutility from hiring minority workers.
- Taste-based employer discrimination should not generally persist in competitive markets.
- Models of **statistical discrimination**, demonstrate that treating two groups of workers differently may be the rational response of firms to uncertainty about an individual's productivity.
- With statistical discrimination persistent wage differentials may arise between workers with the same productivity who belong to different, identifiable groups, even in competitive markets.

(c) If the rate of return to skills is higher in the source country than in the destination country, high skilled workers are more likely to migrate to the destination country than low skilled workers.

Solution.

- False
- If the rate of return to skills is higher in the source country than in the destination country, low skilled workers are better off in the destination country while high skilled workers are better of in the source country. Workers will only migrate if they are better of in the country of destination. The picture below shows that if the return to skills is higher in the source country than in the destination country this will result in a negatively selection, low skilled workers will migrate while high skilled workers will not migrate to the destination country.



(*a*) Positive Selection (*b*) Negative Selection

(d) Use the information in the following Table that shows the productivity and cost of schooling for high- and low-productivity workers.

Type of worker	**Present value of lifetime productivity**	**Cost of a year of schooling**
low-productivity	450 000	20 000
high-productivity	600 000	10 000

If high-productivity workers obtain 8 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.

- True
- 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.

$$600000 - 10000 \cdot y \geq 450000 \longrightarrow y \leq 15$$

$$600000 - 20000 \cdot y < 450000 \longrightarrow y > 7.5$$

- In a separating equilibrium high-productivity workers obtain $7.5 < y \leq 15$ years of schooling.
- If high productivity workers would obtain 8 years of schooling they would signal that they are of high productivity. Since it is unprofitable for low productivity workers to obtain 8 years of schooling they obtain no schooling and this would result in a separating equilibrium.

2. The theory of compensating wage differentials

   (a) Draw two indifference curves in Probability of Injury (x-axis) versus Wage (y-axis) space, for two individuals where one is more risk averse than the other but who are otherwise identical (explain the shape of the indifference curves and which one is which).

   without risk (r=0) the two indifference curves should intersect. as risk increases, the more risk averse worker will have a steeper indifference curve because she needs to be compensated by a higher wage increase for a given increase in risk. indifference curves are usually assumed to be convex towards the origin because of decreasing marginal utility of job safety.

   (b) Draw an iso-profit curve in Probability of Injury (x-axis) versus Wage (y-axis) space, and explain its shape.

   the isoprofit curve is upward sloping because increasing job safety is costly. when increasing the wage the firm can keep profit constant by reducing job safety. the isoprofit curve will be concave because of decreasing returns in the provision of safety.

   (c) Illustrate the wage and job characteristics the two workers in (a) will end up with in equilibrium. Explain the intuition of the outcome.

   the least risk averse worker will end up working, while the more risk averse worker is driven out of the market.

3. This question is about: Hunt, J. (1999). Has Work-Sharing Worked In Germany? Quarterly Journal of Economics 114(1). pp. 117-148

   Hunt is interested in how a standard hours reduction (contractual number of hours per week given wages) affects firms' labor demand.

   (a) Suppose that for every hour worked an employee is payed a wage w up to standard hours h_s, and overtime wage $w_o = (1+p)w > w$ for hours worked beyond that. Assume furthermore that there are fixed cost F involved in hiring. Also assume that the firm chooses non-zero overtime hours ($h^* > h_s$). What is the marginal cost for hiring a new worker for h^* hours, and what is the marginal cost of achieving a same increase in hours using the existing workforce?

   $$\begin{aligned} MC_n &= F + wh^* + pw(h^* - h_s) = F + (1+p)wh^* - pwh_s \\ MC_h &= (1+p)wh^* \end{aligned}$$

   (b) How does this policy affect the employment (number of workers employed) of the firm in the short run?

we need to argue on the margin: *reducing* standard hours h_s (the policy) increases the marginal cost of hiring a new worker while it does not affect the marginal cost of increasing the number of hours of an existing worker. the firm will therefore substitute from workers to hours, and employment will decrease. consequently weekly hours worked per employee increases.

(c) Discuss how this policy affects the weekly hours worked per employee in the long run.

in the long run capital is no longer fixed. the policy changes the (relative) cost of labor. following the reasoning in slide 19 in the labor demand lecture, we know that the effect on hours depends on whether the scale effect (negative because input price goes up) and substitution from labor to capital (also negative because decreasing standard hours makes labor *relatively* more expensive compared to capital) dominates the substitution from workers to hours in (b).

(d) Explain how the paper tries to answer this question, and briefly describe the main result.

using DID the paper compares changes in employment in industries that experienced an increase in standard hours to changes in employment in industries that were unaffected. the paper finds some evidence that work-sharing reduced employment. the paper also report results which suggest that hours worked also decreased, but that the increase in wages left workers in employment equally well-off after the reform.

4. This question is about: Niederle and Vesterlund (2007). Do Women Shy Away From Competition? Do Men Compete Too Much? Quarterly Journal of Economics, 122(3). pp. 1067–1101.

   Niederle and Vesterlund conducted a laboratory experiment in which participants had to add up sets of five two-digit numbers under different compensation schemes. Participants in the experiment were seated in rows and informed that they were grouped with the other people in their row. A group consisted of 2 men and 2 women. The participants had to perform 4 tasks in the following order, one of the tasks was randomly selected and the participant was paid the money he or she earned in this task:

   Task 1 - Piece rate: Participants were given the five minute addition task, they could earn 50 cents per correct answer**.**

   Task 2 - Tournament: Participants were given the five minute addition task. The participant that solved the most problems in the group could earn 2 dollar per correct answer, the other participants earned nothing.

   Task 3 - Choice of compensation scheme for future performance: Before performing the five minute addition tasks, the participants had to select whether they wanted to be paid according to a piece rate or a tournament.

   Task 4 - Choice of compensation scheme for past piece-rate performance: Participants did not have to perform the five minute addition task. Participants had to select which compensation scheme they wanted to apply to their past piece-rate performance of task 1.

   The following Table shows results of the paper.

PROBIT OF TOURNAMENT-ENTRY DECISION (TASK 3)

	Coefficient (p-value)		
	(1)	(2)	(3)
Female	−.379	−.278	−.162
	(.01)	(.01)	(.05)
Tournament	.015	−.002	−.009
	(.39)	(.90)	(.42)
Tournament–piece rate	.008	−.001	.011
	(.72)	(.94)	(.44)
Guessed tournament rank		−.181	−.120
		(.01)	(.01)
Submitting the piece rate			.258
			(.012)

Dependent variable: Task-3 compensation scheme choice (1-tournament and 0-piece rate). The table presents marginal effects evaluated at a man with thirteen correct answers in the tournament and twelve in the piece rate, who submits to the tournament, and with a guess of one in the Task-2 tournament. Guesses of four are eliminated, resulting in a sample of thirty-eight women and thirty-nine men.

(a) A potential explanation for differences in labor market outcomes between men and women is that women perform worse in a competitive environment compared to men. Do Niederle and Vesterlund (2007) find evidence for this explanation?

Solution: No, Niederle and Vesterlund find that men and women do not differ significantly in the number of problems they solve under a piece rate nor under the tournament. Despite there being no gender difference in performance under either compensation sheme, Niederle and Vesterlund find that twice as many men as women select the tournament. Niederle and Vesterlund therefore do not find evidence for the above mentioned explanation, instead they find evidence that gender differences in preferences for competition might be an explanation for differences in labor market outcomes.

(b) Interpret the estimate in row (1)-column (1) in the table above.

Solution: The reported marginal gender effect of -0.38 shows that a man with a performance of 13 in the tournament and 12 in the piece rate would have a 38 percentage point lower probability of entering the tournament if he were a woman. Thus controlling for past performance, women are much less likely to select a competitive compensation scheme.

(c) In task 4 participants select which compensation scheme they want to apply to their past piece-rate performance of task 1. In column (3) of the Table above, Niederle and Vesterlund include the choice made in task 4 as control variable ("Submitting the piece rate"). Interpret the coefficient in column (3)-row (1) and explain what conclusion Niederle and Vesterlund draw on the basis of the results in column (3).

In task 4 participants have to select which compensation scheme they wanted to apply to their past piece-rate performance of task 1. This choice might be affected by the degree of overconfidence, risk aversion and feedback aversion of the participant. In task 3 participants also have to choose between a piece rate and tournament, but here they also subsequently have to perform the task under the chosen compensation scheme. Niederle and Vesterlund argue that by including the task 4 choice as control variable in colun (3) they account for gender differences in overconfidence and risk and feedback aversion and that the coefficient on the variable gender (column (3)-row (1)) can be interpreted as the gender gap in tournament entry (which equals 16%) due men and women differing in their preference for performing in a competitive environment.

5. This question is about: Guido Imbens, Donald Rubin and Bruce Sacerdote (2001). Estimating the Effect of Unearned Income on Labor Supply, Earnings, Savings and Consumption: Evidence from a Survey of Lottery Players. American Economic Review, 94, 778-794.

Imbens, Rubin and Sacerdote investigate the effect of unearned income on earnings, consumption, and savings. They use an original survey of people playing the lottery in Massachusetts in the mid-1980's to analyze the effects of the magnitude of lottery prizes on economic behavior. The following Table shows results of the paper.

[redacted]—ESTIMATES OF MARGINAL PROPENSITY TO EARN (MPE) OUT OF UNEARNED INCOME: INTERACTIONS WITH PRIOR LABOR MARKET HISTORY, SEX, AGE, EDUCATION, AND TIME SINCE WINNING

Outcomes	Baseline MPE[a]	Prior earnings zero[b]	Female[b]	$55 < \text{Age} \leqq 65$[b]	Age > 65[b]	College[b]	Years since winning[b]
Average post-lottery earnings	−0.124	0.209	0.002	−0.167	−0.001	0.037	−0.010
	(0.054)	(0.084)	(0.057)	(0.070)	(0.090)	(0.061)	(0.022)
Year 0 earnings	0.032	0.014	−0.015	−0.094	−0.004	−0.027	0.006
	(0.029)	(0.045)	(0.031)	(0.038)	(0.049)	(0.033)	(0.012)
Year 1 earnings	−0.096	0.108	0.057	−0.204	−0.045	0.043	0.001
	(0.047)	(0.073)	(0.050)	(0.061)	(0.079)	(0.053)	(0.019)
Year 2 earnings	−0.119	0.175	0.020	−0.215	−0.039	0.086	−0.025
	(0.056)	(0.088)	(0.060)	(0.073)	(0.095)	(0.064)	(0.024)
Year 3 earnings	−0.120	0.225	−0.058	−0.178	0.003	0.040	−0.004
	(0.061)	(0.097)	(0.066)	(0.081)	(0.104)	(0.070)	(0.026)
Year 4 earnings	−0.133	0.158	0.005	−0.100	0.099	0.009	−0.024
	(0.065)	(0.103)	(0.070)	(0.085)	(0.110)	(0.074)	(0.027)
Year 5 earnings	−0.138	0.235	−0.000	−0.127	0.032	−0.001	−0.002
	(0.069)	(0.108)	(0.074)	(0.090)	(0.116)	(0.078)	(0.029)
Year 6 earnings	−0.137	0.355	−0.009	−0.177	−0.057	0.045	−0.009
	(0.070)	(0.110)	(0.075)	(0.091)	(0.118)	(0.079)	(0.029)

Notes: The sample consists of the 194 winners with a yearly prize less than or equal to $100,000. All regressions include the yearly lottery prize, the lottery prize interacted with an indicator for zero earnings prior to winning, an indicator for women, an indicator for age between 55 and 65 at the time of winning, an indicator for age over 65 at the time of winning, an indicator for some college, and years since winning, as well as the large set of control variables (years of education, age, dummies for sex, college, age over 55, age over 65, small set of controls plus number of tickets bought, year of winning, earnings in six years prior to winning, dummies for positive earnings in six years prior to winning, dummy for working at the time of winning).

[a] Reports the marginal propensity to earn out of unearned income for the baseline individual, a man who won in 1986, who had positive earnings in the year prior to winning, with no college, less than 55 years old at the time of winning.

[b] The estimates are those for the coefficients corresponding to the interaction with yearly lottery prize.

(a) On the basis of the neoclassical model of labor-leisure choice, what is the expected effect of winning a prize in the lottery on labor supply?

Winning a prize in the lottery increases the amount of unearned income which leads to a parallel, upward shift in the budget line. The effect on labor supply depends on whether leisure is a normal or inferior good. If leisure is a normal good the income effect is positive and hours of leisure will increase as a result of the lottery prize and labor supply will decrease. If leisure is an inferior good the income effect is negative and hours of leisure will decrease as a result of the lottery prize and labor supply will increase.

(b) Is it important that Imbens, Rubin and Sacerdote (2001) exploit variation in lottery prizes to estimate the effect of unearned income on labor supply? Explain why or why not. What is the critical assumption in the paper?

Yes it is important because estimation of income effects is complicated by the fact that realistic amounts of income are almost never randomly assigned and exogenous changes in income are difficult to identify. Individuals with high amounts of unearned income likely differ in unobserved characteristics from individuals with low amounts of unearned income. Differences in labour supply between individuals with different amounts of unearned income are therefore not necessarily due to these differences in unearned income but can also be due to differences in unobserved characteristics. The critical assumption is that among lottery winners the magnitude of the prize is randomly assigned

(c) Interpret the result in column (1)-row (1) in the Table. Do Imbens, Rubin and Sacerdote find that leisure is a normal good?

The result in column (1)-row (1) in the Table is the estimated effect of the yearly lottery prize on average post lottery earnings for the baseline individual, which is a man who won in 1986, who had positive earnings in the year prior to winning, with no college, less than 55 years old at the time of winning. The estimate can be interpreted as the marginal propensity to earn (MPE) out of unearned income. The result in column (1)-row (1) shows that unearned income reduces labor earnings, which indicates that leisure is a normal good.