

Final Exam ECON4715 – Labour economics

This exam has 4 questions, with in total 16 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) Assuming consumption and leisure are normal goods, hours worked will fall when the wage increases if the income effect dominates the substitution effect.

TRUE: when consumption and leisure are normal goods an increase in the wage make leisure (relatively) more expensive. the individual will therefore consume less leisure, ie work more. the income effect goes in the other direction. an increase in the wage can therefore only lead to a fall in hours worked when the income effect dominates the substitution effect.

- (b) In order to use schooling as a signal, the signal must be more costly for low-skilled workers than for high-skilled workers.

TRUE: the cost of the signal is the only reason why low and high skilled people pursue different levels of schooling. so if the cost of the signal is identical for low and high skilled people there will be a pooling equilibrium. if the cost of schooling is higher for high skilled individuals then they cannot separate themselves from the low-skilled either.

- (c) When the government imposes a payroll tax on workers, the effects are identical to the effects had the government imposed the tax on employers.

TRUE: see section 4.3 Borjas

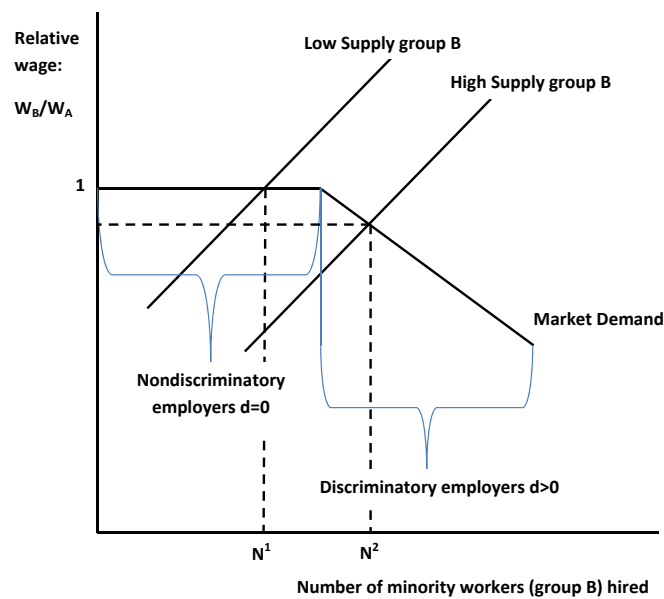
- (d) If in the principal-agent model the principal can only offer a contract $w = b \cdot y$ (instead of $w = s + b \cdot y$) then the firm will set b strictly less than 1.

TRUE: if b would equal 1 then the firm would not make a positive profit.

2. Becker's theory of taste based discrimination

- (a) Explain whether the presence of employer taste based discrimination always results in a wage differential between workers that belong to the minority (discriminated) group and workers that belong to the majority group.

As can be seen in the graph, employer taste based discrimination can result in a wage gap between minority workers (B) and workers from the majority group (A), but this need not always be the case. It depends on the number of (non)discriminatory employers and on the labor supply of minority workers. If at $w_A = w_B$ the demand for minority workers is equal to the supply of minority workers there will not be a wage differential because all the minority workers will be hired by nondiscriminatory employers. If however at $w_A = w_B$ the demand for minority workers is less than the supply of minority workers there will be a wage differential.



- (b) Explain the consequences of employer taste based discrimination for the composition of the workforce of firms.

If employer taste-based discrimination results in a wage differential between workers from the minority and majority group:

- Non-discriminatory employers will only hire workers from the minority group because they are equally productive and cheaper (lower wage).
- Discriminatory workers will hire only workers from the minority group if their discrimination coefficient d is not very high ($d \leq w_{majority} - w_{minority}$)
- Discriminatory workers will hire only workers from the majority group if their discrimination coefficient d is high ($d > w_{majority} - w_{minority}$)

If employer taste-based discrimination does not result in a wage differential between workers from the minority and majority group:

- Non-discriminatory employers can either hire workers from the minority group, the majority group or both because they are indifferent between both groups of workers.
- Discriminatory workers (with a positive discrimination coefficient d) will hire only workers from the majority group.

- (c) Explain the long-run consequences of employer taste based discrimination.

The Becker model of employer taste-based discrimination predicts that discrimination is unprofitable. If employer discrimination results in a wage differential between workers from the minority and majority group, discriminatory employers will have lower profits because they hire the wrong number of workers and/or hire the wrong type of workers. In a perfectly competitive market with free entry and exit it is expected that in the long run all discriminatory firms disappear. If however the market is not perfectly competitive or if there exist also customer discrimination, discriminatory firms can exist in the long run.

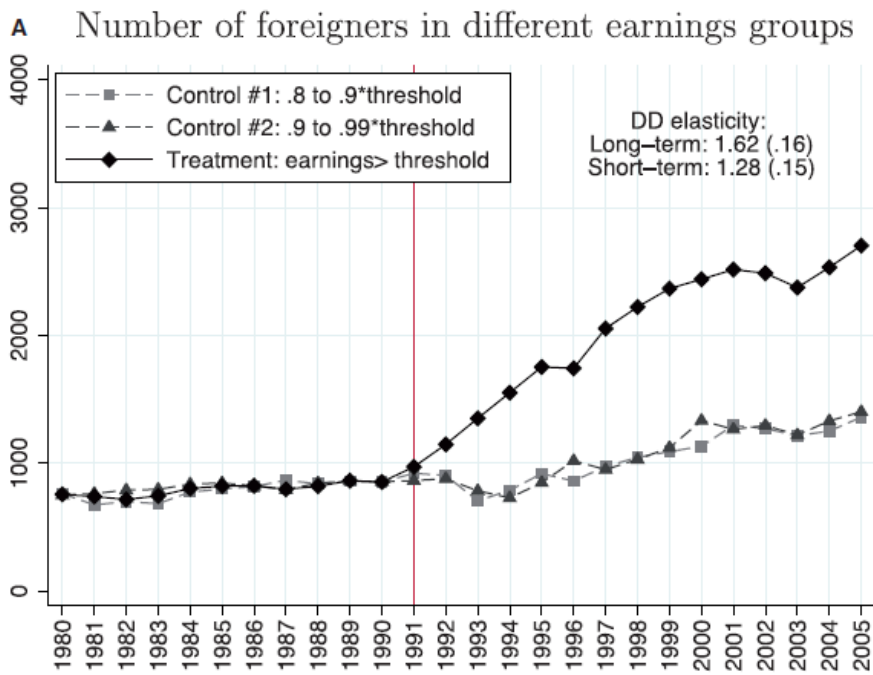
- (d) Explain whether employee taste-based discrimination always results in a wage differential between workers that belong to the minority (discriminated) group and workers that belong to the majority group.

If employees from the majority group are discriminatory (they dislike working alongside workers from the minority group), they will demand a higher wage if they have to work alongside workers from the minority group. However, if employers are nondiscriminatory there will not be a wage differential between workers from the minority and majority group. Since both workers are equally productive a nondiscriminatory employer will not want to pay more for a worker from the majority group. The model of employee taste based discrimination does predict a segregated workforce.

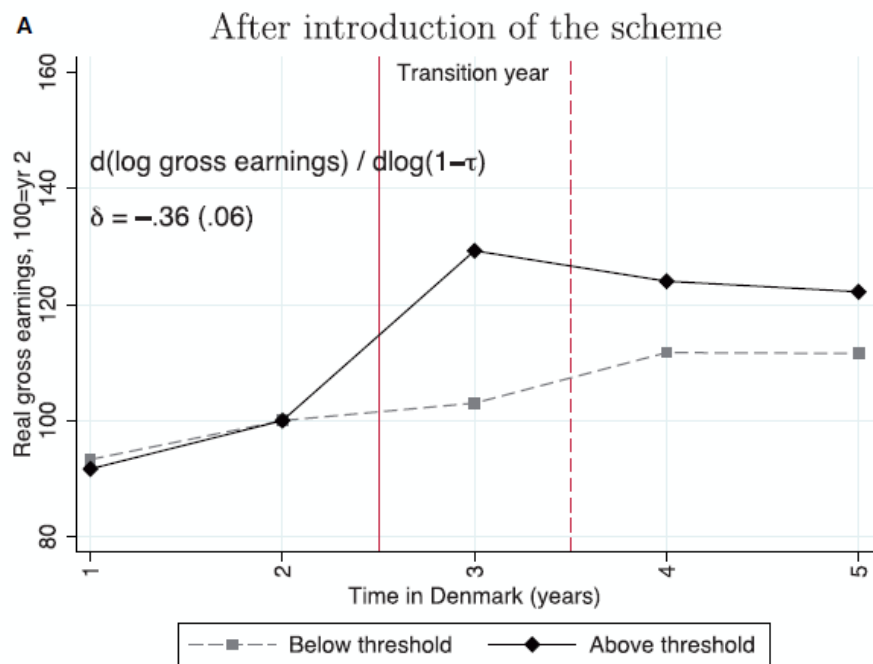
3. This question is about: H. J. Kleven, C. Landais, E. Saez, and E. Schultz: *Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners' Tax Scheme in Denmark*, *The Quarterly Journal of Economics* (2014) 129 (1): 333-378. The papers studies a preferential tax scheme for foreign top earners in Denmark, who were subject to a low 30% tax rate for a maximum of three years if they earned more than the threshold \bar{z} .

- (a) Figure 1a is taken from the paper. Under what assumptions does this figure show that there was a positive causal impact of the scheme on migration?

The identifying assumption of the Difference-in-Differences approach is common trends: the trends in the treated and control groups would have been the same in the absence of treatment. In our case, we must have that the change in immigration from the top earners would have been the same as the change among the close-to-top earners. The figure provides solid support for this assumption: Before the reform, the trends in the treatment and the two controls groups are very similar, and the graphs overlap.



(a) Kleven et al. (2014): Figure III

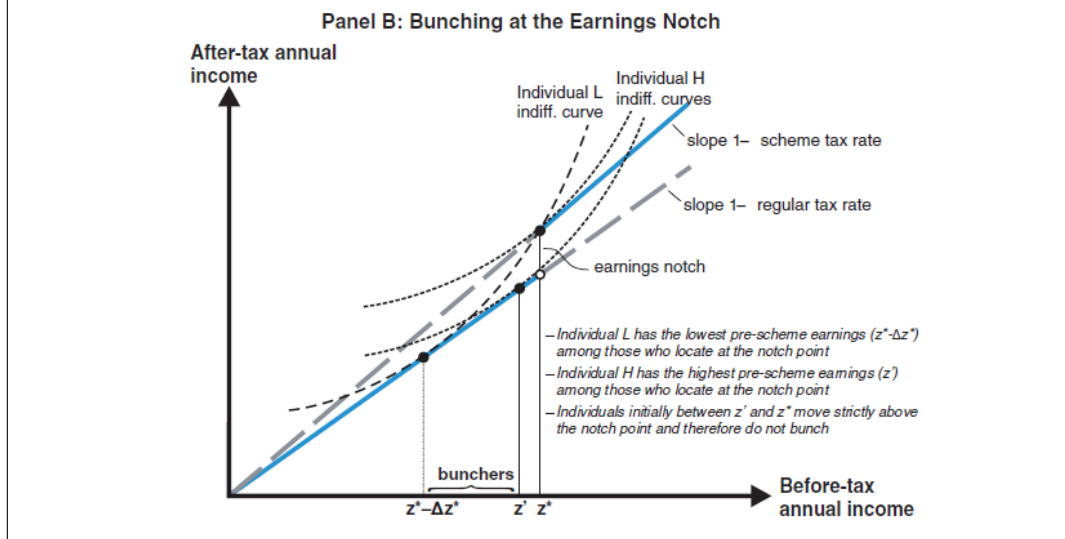


(b) Kleven et al. (2014): Figure VII

Figure 1. Figures from Kleven et al. (2014)

- (b) What is the predicted effect of the tax scheme on the labor supply of people who earn less than \bar{z} and who earn more than \bar{z} according to the neoclassical labor supply model?

The scheme creates a notch in the budget constraint, as illustrated in the figure: If the individual would have pre-income earnings above \bar{z} , the budget constraint has slope $1 - \tau_s > 1 - \tau$, and the budget constraint is steeper than before the threshold. This induced individuals who would previously prefer to have earnings in an interval close to \bar{z} to increase their labor supply so as to make exactly \bar{z} and benefit from the scheme. For individuals who would previously locate far below \bar{z} , there will be no change: They will still prefer the lower labor supply. For individuals who would previously locate above \bar{z} , if uncompensated labor supply elasticity is positive, we expect increased labor supply, but no bunching. Therefore, the total prediction is bunching from below: We will find reduced share of workers right below the notch and increased share of workers at the notch.



- (c) What is the predicted effect of the tax scheme on the labor supply of people who earn less than \bar{z} and who earn more than \bar{z} according to the matching frictions model where the wage is determined by Nash bargaining?

In a matching friction model, employees aren't paid their productivity, perhaps because the employer has some monopsony power. Instead, wages are determined by wage bargaining, where the wage will be somewhere between the extremes y_0, y , where y_0 is the employees reservation wage and y the productivity. Anywhere in this interval, both the employer and the employee will make profits from the arrangement. The actual wage depends on the workers' bargaining power β : The higher β the closer to y the wage will be. When the scheme is introduced, the employee's reservation wage y_0 goes down as long as the employee is scheme eligible. As long as the bargaining power of the firm is nonzero and constant, this will reduce earnings: The employee's threat point has shifted down. Therefore, in the matching frictions model, we will see reductions in pre-tax earnings for the people who earn above the threshold \bar{z} , and we will have bunching from above as well as below.

- (d) Figure 1b provides some evidence on the wage profiles of foreign workers in Denmark. Does this support the neoclassical labor supply model or the wage bargaining model?

The wage bargaining model. The neoclassical labor supply model predicts wages equal to productivity: The employee capture the full benefit of the scheme. Therefore we should see similar wage profiles for the eligible and non-eligible workers. The clear increase in wages when the scheme elapses for the eligible versus the non-eligible workers is evidence against this. In contrast, the wage bargaining model predicts this increase: When the scheme elapses the reservation wage of the worker increases, and so her pre-tax earnings increases as long as her bargaining power β is positive.

4. This question is about D. O. Staiger, J. Spetz and C. S. Phibbs, *Is There Monopsony in the Labor Market? Evidence from a Natural Experiment*, *Journal of Labor Economics* (2010) Vol. 28. no 2.

(a) Explain the difference in the determination of wages between the competitive firm and a monopsonist.

The monopsonist has market power over wages, and so face an upward sloping labor supply curve: If they want to hire more workers, they need to raise wages. They thus maximize $\Pi(L) = p * F(L) - w(L)$, where F is the production function, p is the price of the output and $w(L)$ is the labor supply function. Optimal choices satisfy $pF'(L) = w'(L)L + w(L)$. Just like a competitive firm, a monopsonist equates marginal product to marginal cost, but the marginal cost is not just the wage of the extra worker w , but also $w'(L) * L$, which captures the fact that the monopsonist need to raise the wages of all workers in the firm in order to be able to hire another worker. A monopsonist will hire fewer workers than a competitive firm to exploit their market power.

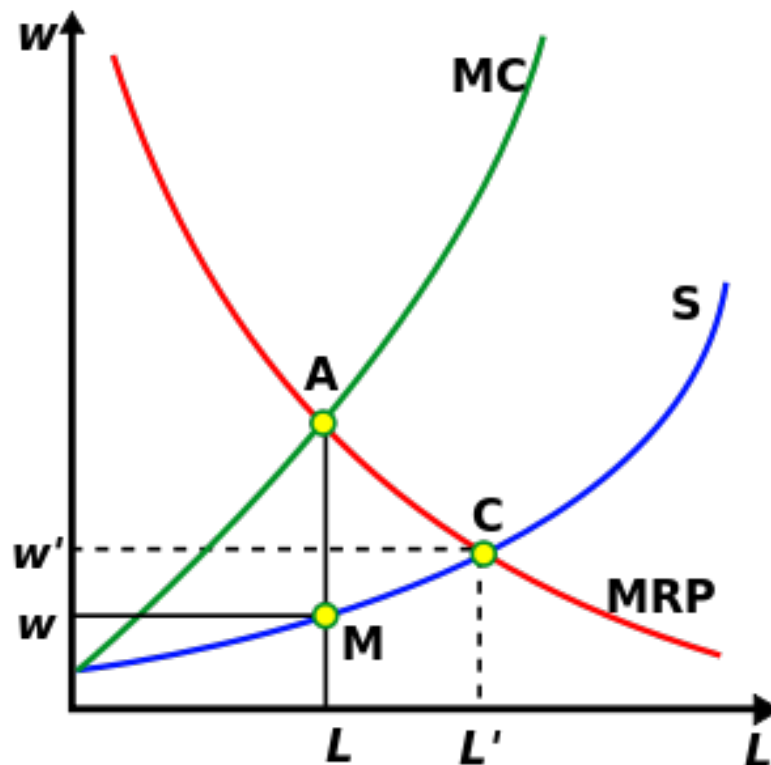


Table 1. Table from Staiger, Spetz and Phibbs (2010)

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 (.033) | .178 (.043) | .137 (.077) | .190 (.106) |
| Change in log wage of RNs at the nearest VA (1990–92) × dummy if > 15 miles to VA | | -.078 (.040) | -.105 (.042) | -.139 (.082) |
| Change in log wage of RNs at the nearest VA (1990–92) × dummy if > 30 miles to VA | | -.049 (.037) | -.035 (.056) | -.100 (.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 |

- (b) The paper investigates whether mandated changes in the wages for nurses at Veteran Affairs (VA) hospitals affect wages for nurses at other hospitals in the same area. Table 1 provides the main results. Does this provide evidence for monopsony power in the market for nurse labor? Why or why not?

The table shows that nurse wages at private hospitals increase with approximately . A 10% increase in wage wages at the nearest VA hospital leads to a 2% increase in wages at private hospitals nearby. This is indication that the hospitals have market power - there are few employers for nurses, and so the exogenous pay raise at VA hospitals force the private hospitals to raise wages in order to be able to attract nurses. In addition, we see that this market power decreases with distance from the VA hospital: The effect basically goes away for hospitals more than 15 miles away from the nearest VA hospital, as evident by the coefficient of -.139. This is an indication that market power is local - maybe because accepting work at a faraway hospital require moving, and this has a cost for the nurses.

- (c) The paper reports an estimated short run labor supply elasticity equal to 0.1. Explain whether this estimate indicates the presence of a high or a low level of monopsony power.

A labor supply elasticity of .1 means that a 1% increase in wages induce a 0.1% increase in labor supply, or equivalently the firm needs to offer 10% higher wages in order to attract 1% more labor, a very inelastic labor supply. In contrast, under perfect competition the labor supply is perfectly elastic, indicating very high or even infinite labor supply elasticities. The low estimate indicates considerable market power, which will lead to nurses being paid far lower wages than their marginal product.

- (d) Is the long-run labor supply elasticity likely to be larger or smaller?

Larger - nurses (and workers in general) are likely to be much more mobile in the longer run, thus more able and willing to move to exploit higher wages in other hospitals.

- (e) What are the welfare implications of a monopsony?

There are deadweight losses - higher total welfare gains could be had in the competitive equilibrium. Both labor supply and wages would be higher, but of course the monopsonist would have lower profits.

