Exam SØK3521 May 2024

All questions are worth the same marks. Answer all 3 questions.

Question 1 Peer Effects

(a) What are peer effects in education and what are the difficulties in estimating peer effects?

Consider the following linear-in-means model

$$Y_{ijt} = \beta \bar{Y}_{-i,jt-1} + \gamma \boldsymbol{X}_{ijt} + \varepsilon_{ijt} \quad (2)$$

Where Y is a measure of educational attainment, X is a vector of controls and $\overline{\mathrm{Y}}_{-\mathrm{i,jt}}$ is the average educational attainment of the ith student's peer group (j) at the end of the previous time period (t-1).

(b) β provides an estimate of the peer effect. How would we interpret an estimate of 0.12?

(c) Why might it matter for policy if these peer effects are linear or not?

Question 2 Returns to Education

Consider the following mincerian wage equation

$$\ln(w_i) = \beta_0 + \beta_1 yos_i + \beta_2 exp_i + \beta_3 exp_i^2 + \varepsilon_i \quad (1)$$

This states that (log) wages (w) of individual *i* are a function of years of schooling, labour market experience (exp) and the labour market experience squared (exp^2). While ε is an error term :

a. If you estimated (1) on representative labour force data, what sign (positive, negative or zero) would you expect β_1 , β_2 and β_3 to take? In answering this explain why.

b. How do ability differences across individuals lead to differences in levels of schooling? What implications does this have for interpreting the results from estimating (1).

Question 3 Educational Production

a. How can education production functions be used to explain individual educational attainment?

b. Appendix A reports individual country differences in attainment from an international average. These differences are decomposed into unaccounted and accounted for differences in terms of inputs into an educational production function.

   What is the interpretation of these two sources of differences? Why might this be important for educational policy? Use specific country examples to discuss this point.

Appendix A.

Table 4

Accounting for Each Country's Difference from the International Mean

				Of which: accounted for by		
	Observed difference (1)	*Unaccounted difference* (2)	*Accounted difference* (3)	*Family background* (4)	*School resources* (5)	*Institutions* (6)
Finland	44.5	31.7	12.9	2.7	−1.3	11.5
Korea	42.0	14.3	27.7	13.0	5.6	9.1
Netherlands	38.4	−8.0	46.4	−3.4	−0.3	50.1
Japan	34.0	4.4	29.6	17.5	2.9	9.2
Canada	33.0	17.4	15.6	15.9	3.2	−3.5
Belgium	29.5	−11.8	41.3	−1.2	1.4	41.0
Switzerland	26.5	27.3	−0.8	−13.2	9.5	2.9
Australia	24.5	2.1	22.4	14.0	6.6	1.7
New Zealand	24.5	17.8	6.7	16.2	−3.0	−6.4
Czech Republic	16.4	2.1	14.3	16.1	−9.0	7.2
Iceland	15.1	−11.6	26.7	29.7	4.9	−7.9
Denmark	14.1	6.0	8.1	0.4	6.5	1.2
Sweden	10.0	5.5	4.5	5.9	−1.0	−0.4
United Kingdom	8.4	−9.1	17.5	13.0	2.7	1.8
Austria	5.5	5.7	−0.2	2.1	6.1	−8.5
Ireland	3.9	−15.0	18.8	−3.3	1.6	20.5
Germany	3.5	5.4	−1.9	−4.0	−0.8	2.8
Slovak Republic	−1.0	6.3	−7.3	4.2	−18.0	6.5
Norway	−4.3	−26.4	22.1	22.1	2.1	−2.1
Luxembourg	−6.3	−10.7	4.4	−25.5	19.3	10.6
Hungary	−9.3	−18.7	9.4	4.5	−5.4	10.4
Poland	−9.5	2.5	−12.0	−11.5	−8.1	7.6
Spain	−14.1	−2.7	−11.4	−4.8	−5.4	−1.2
United States	−16.1	−14.7	−1.4	2.3	9.1	−12.9
Portugal	−33.5	23.0	−56.5	−27.0	−2.8	−26.7
Italy	−33.9	−5.5	−28.3	2.7	3.6	−34.7
Greece	−55.1	−22.1	−33.0	−4.1	−3.0	−26.0
Turkey	−75.8	−4.4	−71.5	−31.7	−17.5	−22.3
Mexico	−114.8	−10.6	−104.2	−52.7	−9.9	−41.6

Notes: Each entry shows the country's test score difference from the international mean on the PISA 2003 mathematics test, expressed in student-level standard deviations. Column 1: actual difference. Column 2: difference not accounted for by a country-level regression of the actual test score difference on the three combined input factors (family background, school resources, institutions), each of which is measured as a linear combination of individual variables using coefficient estimates from the student-level regression of Table 2, collapsed to the country level. Column 3: difference accounted for by this country-level regression. Columns 4–6: difference accounted for by family background, school resources, and institutions, respectively. By constructions, columns 2 and 3 sum to column 1, and columns 4–6 sum to column 3.

Excerpt from Woessmann (2016)