Exam SØK3521 May 2022

Answer all 4 questions. Share of marks included with each question.

Question 1 (30%) Human Capital

Consider the following mincerian wage equation

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

Which 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. Why is it a standard finding that β_2 >0 and β_3 <0 (the returns to experience are positive but at a declining rate)?

b. Imagine we estimate (1) on a representative sample of the population and find that $\widehat{\beta_1}$ =0.07. What does this tell us about the relationship between years of schooling and wages? What are the problems with interpreting this causally?

c. Discuss how changes in regulations such as compulsory school laws can be used to estimate the causal returns to schooling.

Question 2 (30%) Educational Production

Appendix 1 provides an individual country differences in attainment. These differences are decomposed into unaccounted and accounted for differences in terms of inputs into an educational production function.

a. Using an education production function approach provide an interpretation of these differences. (Hint: focusing on one or two countries may make this easier)

b. Take one country (for instance Norway) and provide policy advice on the basis of this evidence.

Question 3 (20%) Peer Effects

a. What do we mean by peer effects in schooling, what are the difficulties in estimating peer effects, and why are peer effects important for policy?

Question 4 (20%) Teachers

a. How could performance related pay schemes be used to increase teacher effectiveness? Discuss limitations / concerns with this approach.

Table 4
Accounting for Each Country's Difference from the International Mean

	Observed difference (1)	Unaccounted difference (2)	Accounted difference (3)	*Of which: accounted for by* 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)