NTNU
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Department of Economics

Examination paper for SØK3521
Economics of Education

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Permitted examination support material: C

Formelsamling:

Knut Sydsæter, Arne Strøm og Peter Berck (2006): Matematisk formelsamling for økonomer, 4utg. Gyldendal akademiske.

Knut Sydsæter, Arne Strøm, og Peter Berck (2005): Economists' mathematical manual, Berlin.

Calculator:

Casio fx-82ES PLUS, Casio fx-82EX Citizen SR-270x, SR-270X College or HP 30S.

Language:	English
Number of pages (front page excluded):	3
Number of pages enclosed:	0

Informasjon om trykking av eksamensoppgave

Originalen er:

1-sidig ☐ **2-sidig** ☐

sort/hvit ☐ **farger** ☐

skal ha flervalgskjema ☐

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Date Signature

Answer all 5 questions. Share of marks including with each question.

Question 1 (25%)

Consider the following mincerian wage equation

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

Where ln(*w*) is the natural log of individual *i's* wage, *yos* is their number of years of schooling, and *exp* is their years of labour market experience.

Imagine we estimate (1) by Ordinary Least Squares on a representative sample of the working population and gain an estimate of $\hat{\beta}_1 = 0.07$.

a. What is the interpretation of this estimate? What are the barriers to interpreting this estimate causally? Why might it matter whether the relationship between years of schooling and earnings can be interpreted as being a causal relationship?

Suppose there is a change in the compulsory school leaving age. Previously you could leave school in the year you turn 15. Now you must stay at school until you are 16. i.e. You must stay an additional year in school (for instance, like the 1972 England and Wales reform described in Grenet, 2013, and Clark and Royer, 2013). We re-estimate (1) using this increases as a source of exogenous variation in years of schooling and gain an estimate of $\hat{\beta}_1 = 0.14$.

b. What is the interpretation of this estimate? How can this be reconciled with your answer to 1a? What does this estimate tell us about the wage returns to completing a university degree?

Question 2. (25%)

a. How might peer group composition influence educational attainment? What are the key difficulties in understanding whether there are peer effects in education?

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 $\bar{Y}_{-i,jt}$ is the average educational attainment of the *ith* student's peer group (*j)* at the end of the previous time period (*t-1). β* provides an estimate of the peer effect, if any. Carrell et al (2009) estimate a variant of (2) and find peer effects on individual educational performance of between 0.34 and 0.42.

b. What does this estimate tell us about the relationship between average peer group composition and individual educational performance? What implications does it have for average educational performance and the distribution of test scores?

Carrell et al (2009) also (see attached – Appendix A1) find that these effects are larger for students who we would expect to have lower educational attainment.

c. What implications could this result have for policy? Are there any reasons why it may be difficult to generalize these results to other educational settings?

Question 3 (15%)

a. How and why might class size influence educational attainment?

b. How do class size rules help us to understand the effect of class size on student educational performance?

Chetty et al (2011 for the US) and Fredriksson et al (2012 for Sweden) provide evidence that exposure to lower class sizes increase earnings in later life.

c. Why is it interesting to examine the effects of class size on wages along with the effects on test score performance?

Question 4 (15%)

a. What do we mean by 'effective' teachers? Why might it be important to identify them?

b. How can performance-related pay schemes potentially increase worker output? What are some issues in applying these schemes to teachers and schools?

c. How do accountability schemes aim to increase school performance?

Question 5 (20%)

a. Why do you think there is so much focus on estimating *causal* effects in the economics of education? Illustrate your answer using a research paper(s) of your choice.

APPENDIX A1

Predicted GPA Using Pretreatment Characteristics	Bottom	Middle	Top
Peer SAT verbal (other freshmen in squadron)	.565***	.361**	.312**
	(.159)	(.154)	(.132)
Peer SAT math (other freshmen in squadron)	−.198	.006	−.056
	(.146)	(.140)	(.112)
Peer academic composite (other freshmen in squadron)	−.067	−.042	.022
	(.045)	(.041)	(.036)
Peer fitness score (other freshmen in squadron)	.154***	.184***	.169***
	(.107)	(.091)	(.074)
Peer leadership composite (other freshmen in squadron)	.057	.006	.007
	(.057)	(.050)	(.046)
Observations		19,966	
R^2		.3526	
Control variables		Roommate and upper class peer variables, course by section fixed effects, year fixed effects	

NOTE.—The dependent variable in each specification is the course grade in the fall semester. Each observation is weighted by the number of course credit hours. Missing roommate pretreatment data were imputed using the cohort mean of each variable. Separate coefficients are estimated for students in each third of the incoming academic ability distribution. Robust standard errors in parentheses are clustered by class by squadron. All specifications include individual-level controls for students who are black, Hispanic, Asian, female, recruited athlete, attended a preparatory school, and missing roommate data.

** Significant at the .05 level.

*** Significant at the .01 level.

Excerpt from Carrell, Fullerton and West (2009)