

Empirical Labor Economics
Final Exam
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 60 Points

Note: Choose either Part 1 or Part 2. If you answer both parts, we will only consider Part 1.

Part 1:

- 1.1. Discuss the estimation of returns to schooling by discussing instruments used by Ashenfelter and Krueger (1994), and Angrist and Krueger (1991). (30 points)
- 1.2. When should we use standardized coefficients, how do we derive it, and how do we interpret it? (6 points)
- 1.3. What are the four assumptions of unbiasedness in a single and multiple regression analysis? (8 points)
- 1.4. What is a proxy variable, when and why do we use it? (6 points)
- 1.5. Interpret and compare the following two wage estimations: (10 points)

$$(1) \ln Wage = \alpha + 0.082 \text{ Schooling} + \varepsilon$$

(0.02)

$$(2) \ln Wage = \alpha + 0.106 \text{ Schooling} + 0.080 \text{ Experience} - 0.0012 \text{ Experience}^2 + \varepsilon$$

(0.012) (0.01) (0.0002)

Standard errors are in parentheses.

Part 2:

- 2.1. Discuss the relationship between family size and schooling by discussing instruments used by Angrist *et al.* (2010). (30 points)
- 2.2. What is a negative selection bias, its consequence and how do we solve the problem? (6 points)
- 2.3. Explain homoscedasticity and heteroscedasticity, and show it graphically. (8 points)
- 2.4. What type of variables are often used in log form and what type of variables are often used in level form? (4 points)
- 2.5. What are the compliance types by treatment and instrument? Explain each compliance type shortly. (12 points)

Compliance types by treatment and instrument:

$D_i \backslash Z_i$	1	0
1		
0		

Compliance types by treatment and instrument under **monotonicity assumption**:

$D_i \backslash Z_i$	1	0
1		
0		