

Problem Set #1b

Danny Edgel
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Question 1

- (a) The attached file, functions.jl, includes all functions used in this problem set, including an OLS function. edgel_ps1.tex includes the code the executes the commands for the problem set. Using these files, the coefficient for education is derived as 0.151 .
- (b) The education coefficients for the .5 and .75 quantiles are below.

$$\hat{\beta}_1^{.5} = 0.139, \quad \hat{\beta}_1^{.75} = 0.156$$

- (c) The bootstrap SE of $\hat{\beta}_1^{.75}$ for 100 simulations is 0.00001891 .

Question 2

The moment function for GMM is:

$$m(y, x; \beta) = x [\mathbb{1}\{y \leq x'\beta\} (1 - \tau) - \mathbb{1}\{y > x'\beta\} \tau] = x [\mathbb{1}\{y \leq x'\beta\} - \tau]$$

The attached code estimates $\hat{\beta}^{.5}$ and $\hat{\beta}^{.75}$ using this GMM moment condition.

The asymptotic variance-covariance matrix is $(\Gamma'\Omega^{-1}\Gamma)^{-1}$, where, assuming correct specification:

$$\begin{aligned}\Omega &= \mathbb{E}[X_i X_i'] \tau(1 - \tau) \\ \Gamma &= \mathbb{E}[X_i X_i'] f_{\varepsilon_i|X_i}(0)\end{aligned}$$

The estimated coefficient and standard error for $\hat{\beta}^{.75}$ are

Question 3

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)

Question 4

- (a)
- (b)