

Economics 1991EE  
Midterm Practice Problems

- (1) Suppose there are two types of people: high-ability and low ability. High-ability people produce \$40,000 and low-ability people produce \$15,000 in each period that they work. What are the minimum diploma costs for low and high types ( $C_L$  and  $C_H$ ) that will ensure a separating equilibrium in which high types get the diploma and low types do not? Assuming that the diploma takes one period to complete during which time you can not work, and the discount rate is zero.
- (2) Imagine that all workers have the same ability and the wage-schooling locus listed below. How much lower must the discount rate of an undergraduate degree holder (16 year) be compared to that of a high school graduate (12 years)?

Years of Schooling	Annual Wage
10	15,000
11	25,000
12	34,000
13	42,000
14	49,000
15	55,000
16	60,000
17	64,000
18	67,000

- (3) Jack has just finished college and is trying to decide which career path to take. He has two options. For simplicity, let's assume that Jack's planning horizon is only four years. Option one, take a job right now that pays \$30,000 in year 1, \$33,000 in year 2, \$35,000 in year 3, and \$36,000 in year 4. Option 2, spend one more year in school to complete a Masters' degree and then earn \$35,000 in year 2, \$45,000 in year 3 and, \$55,000 in year 4. Which option should he choose if his discount rate is 5% and all costs and wages are paid at the end of the period?
- (4) Using the same data as in assignment 1, the variables are defined as follows:
- $\ln w$  = the ln hourly wage rate
  - $s$  = years of schooling
  - $s\_sq$  = years of schooling squared (i.e. if  $s=3$  then  $s\_sq=9$  and if  $s=6$  then  $s\_sq=36$ )
  - $exp$  = years of work experience
  - $female = 1$  if the individual is female
  - $black = 1$  if the individual is black
  - $urban = 1$  if the individual lives in an urban area and 0 otherwise

- married = 1 if the individual is currently married and 0 otherwise
- afqt = an IQ test given to all individuals in the data. The reported scores are percentiles – 1 being the lowest and 99 the highest percentile.

Imagine that you run the following regression:

$$\ln(W_i) = \beta_0 + \beta_1 S_i + \beta_2 S_i^2 + \beta_3 \text{exp}_i + \beta_4 \text{female}_i + \beta_5 \text{black}_i + \beta_6 \text{urban}_i + \beta_7 \text{married}_i + \beta_8 \text{afqt}_i + \varepsilon_i$$

The output from this regression is:

Variable	Coefficient	t-statistic
s	0.0057	0.22
s_sq	0.0023	2.50
exp	-0.0084	-2.20
female	-0.2442	-15.97
black	-0.0629	-3.34
married	0.1101	6.84
urban	0.1092	6.13
afqt	0.0053	14.06
constant	2.2323	9.83

Do these results lead you to question the usual linear education assumption? In other words do these results suggest that the square on education is important to include or not?