

SUNY-Stony Brook. Economics Department
Economics 323: Fall 2011
Professor Hugo Benítez-Silva

Problem Set 5: Due Thursday December 8, 2011.

1 True-False and Multiple Choice (Again, justify all your answers. 5 points each).

A) Adding an exogenous variable to a regression model always improves the R-bar squared. **True or False.**

B) Present oriented people discount future earnings _____ forward looking people

- a)at the same rate as
- b)at a higher rate than.
- c)at a lower rate than.
- d)at a higher or lower rate than.

C) Nina (age 19) would be more likely to obtain a college education if

- a)her discount rate was lower
- b)the supply of others with a college education was greater
- c)she expected to retire at a younger age
- d)she was older

2. Short Essay questions (Answer should not be much longer than a paragraph or two, think before you answer. 10 points each)

2a) A few years ago, the New England Medical College inadvertently accepted more applicants than it could accommodate in its first year class. Not wanting to arbitrarily delay the entrance date of its accepted applicants, it offered them one year of free tuition if they would delay their medical studies by one year. Discuss the factors entering into the student's assessment of whether he or she should take this offer.

2b) In many countries higher education is heavily subsidized by the government (that is, university students do not bear the full cost of their college education). While there are many good reasons for heavily subsidizing university education, there are also some dangers in it. Using human capital theory, explain what these dangers are.

3 Betty, you can call him Al. (15 points)

Betty works in sales but is considering quitting work for two years to earn an MBA. Her current job pays \$40,000 per year (after taxes), but she could earn \$55,000 per year (after taxes) if she had her masters of business administration. Tuition is \$10,000 per year and the cost of an apartment near campus is equal to the \$10,000 per year she is currently paying. Betty's discount rate is 6% per year. She just turned 48 and she plans to retire when she turns 60, whether or not she gets her MBA. Based on this information, should she go to school to earn her MBA? Explain carefully.

4. In my webpage you can download (right click and save) in Excel format (.xls) and Minitab Format (.mtw) data on 85 countries in the late 1980s taken from the Human Development report of the United Nations. (I recommend you use Minitab to complete this exercise) (25 points)

There are three variables in the data set:

- (c1) Life Expectancy at birth
- (c2) Income per capita in US\$
- (c3) Index of access to health care (higher number means better access, 100 is the maximum)

a) Using measures of central tendency and dispersion provide a good description of each of these variables.

b) Graph using Minitab or Excel each of these variables against one another. Describe what you conclude from these graphs. From the Excel file you can read the names of the countries to which these data correspond. Any outliers in terms of the relationship between income and access to health care?

c) Can you think of an economic model that relates life expectancy with these variables? Explain.

d) Estimate the parameters of the following simple regression model

$$\text{Life Expectancy}_i = \beta_0 + \beta_1 \text{Income per capita}_i + u_i$$

Interpret the estimates of the coefficients of interest and the overall regression.

e) Estimate the parameters of this other simple regression model

$$\text{Life Expectancy}_i = \beta_0 + \beta_1 \text{Access to Health Care}_i + u_i$$

Interpret the estimates of the coefficients of interest and the overall regression.

f) What is your opinion of policies promoted by the United Nations to increase access to health care in developing countries? Do you think the simple regression models are enough to make policy recommendations?

5 Education and Earnings revisited (25 points)

We have been talking for some time now about a model that tries to explain the differences in labor earnings across individuals with an array of variables, the most important of which we have assumed is education. Few people would argue against the fact that there is a correlation between education and earnings, but as economists our objective is to quantify the strength of the relationship.

In this exercise you are going to use a data set called the NELS, you can find information about this data set at: <http://nces.ed.gov/surveys/nels88/>

This is a nationally representative sample of eighth-graders who were first surveyed in the spring of 1988. A sub-sample of these respondents, were then resurveyed through four follow-ups in 1990, 1992, 1994, and 2000. On the questionnaire, students reported on a range of topics including: school, work, and home experiences; educational resources and support. For the three in-school waves of data collection (when most were eighth-graders, sophomores, or seniors), achievement tests in reading, social studies, mathematics and science were administered in addition to the student questionnaire.

You can download a sub-sample of this data, with more than 8,500 observations in Excel format from the class webpage.

- a) The survey followed individuals for a few years and recorded the wages of all the respondents that were working as of the year 1999 and asked them for their earnings. It also recorded their education and other characteristics. Provide a quick summary of the main variables of interest, especially income in 1999, and 1998, the education indicators, and other socio-economic characteristics. (Hint: notice that in this case we have indicators for the highest degree obtained, not the number of years of education)

- b) Using first the simple regression model we presented in class compute the premium for having obtained a bachelor degree for this cohort as of their 1999 jobs. What about if you use the 1998 income? (Hint: Remember to use the logarithmic transformation discussed in class to get the premium in percentage terms)

- c) How is this premium affected when you run a multiple regression model where you take into account variables like gender, race, and marital status? What about the effect of having dependents? And owning a house? Interpret the values of the other coefficients in the multiple regression model.

d) Use the R-bar square to decide between models that include more of these additional characteristics. How many variables do you think should the multiple regression model, have to do the best possible job in explaining the variation in income as of 1999?

e) Almost 3,000 of the respondents have a bachelor degree, how many have a Ph.D? What is the premium as of 1999 from having a Ph.D?

f) One of the great advantages of the NELS is that we have the test scores of the respondents as of the time they were 13. Using the math test scores in our multiple regression model explain the effect on income and the college premium. Is it what you expected? What about the other test scores, like reading, science, etc? Do the same using the income as of 1998. Do you think these tests are a good measure of ability?