

MIT OpenCourseWare
<http://ocw.mit.edu>

14.74 Foundations of Development Policy
Spring 2009

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.

14.74 Problem Set # 1

Due at the beginning of recitation on Friday, February 20, 2009

No late problem sets will be accepted

Feel free to work in groups. But please hand in individual problem sets.

Please give clear concise answers (the least amount of words it takes to make your meaning clear). The point of this problem set is to think thoroughly about the models and issues discussed in lectures and recitation and to relate your own insights to the intuition given in class.

1. World Bank Development Report Data

The point of this exercise is to help you understand the faces of poverty on the one hand, and acquaint you with Stata on the other. You will need to download the Stata data set (wbdr.dta; this data set contains 1997 variables, unless otherwise noted) from the course website. There, you will also find instructions for using Stata. *Hand in your do file with the problem set. No need to hand in the log file, although you can hand in the parts that are directly relevant for answering questions below.*

- a. What are the mean and standard deviation of GNP per capita and infant mortality in 1997 across countries? Compare the average male illiteracy rate to the female illiteracy rate. Why might they be different?
- b. Restrict your data set to countries for which we have GNP per capita for 1997. What are the mean, minimum, and maximum illiteracy rate, infant mortality rate (for 1997), and under 5 mortality rate among the 50 richest countries? Among the 50 poorest countries? What does this tell you about the relationship between income and illiteracy, and income and mortality? (*Hint: use the gsort command—read the help files to learn how it works, and make sure that you sort in the correct ascending or descending order! Use “sum in 1/50” to summarize across the first 50 observations in the data set.*)
- c. Now, find the median GNP per capita. How is it different from the mean GNP per capita from part (a)? Why might the mean and median be different? What information can we infer about the income distribution (inequality) from this?

Return to using the original (unrestricted) data set.

- i. Regress the illiteracy rate on per capita GNP in 1997. Report the coefficient on per capita GNP and its standard error; what do they tell you? Is the sign of the coefficient what you expected? Explain briefly. What is the t-statistic for this coefficient, and what does it tell you? Interpret the 95% confidence interval.
- ii. Regress the infant mortality rate in 1997 on GNP per capita in 1997. Is the coefficient on per capita GNP significantly different from zero? How do you know? Interpret the coefficient in terms of a \$1000 difference in per capita GNP.
- iii. Regress the infant mortality rate in 1997 on the illiteracy rate. Graph a scatter plot of the data as well as the regression line. (*Use the “graphics” option from the Stata toolbar. Stata will output the code as well as the graph. You should then try typing the code in directly instead of the editor. It is much faster.*)
- iv. Using the results from part i-iii, what can we say about the causal relationship between illiteracy, infant mortality, and income (GNP)? In other words, tell a

story of how illiteracy, income, and infant mortality might affect one another. Be concise but clear about what causes what and why.

2. Poverty, Nutrition and Labor Markets

This exercise is based on the lecture and the textbook pp. 272-79, 489-504. Each answer should not be longer than a couple of sentences.

- In what circumstances will unequal allocation amongst a 2-member household increase total household work capacity? Discuss the importance of the convexity of the relationship between work capacity and income. Please illustrate this in a simple graph.
- For a workers with no non-labor income (e.g. land) and are getting piece rates, draw the aggregate labor supply curve and a standard downward sloping labor demand curve with piece rates on the y-axis. When will unemployment occur? In equilibrium, why can the piece rate not be bid down so that people who are involuntarily unemployed can obtain work?
- How does having non-labor income affect the work capacity or willingness to work? (Hint: think of the difference tradeoffs between working and not working for the two different types of workers.)
- Discuss in words and graphically how voluntary and involuntary unemployment can be generated in an economy where some workers have non-labor income and other workers do not.
- What policy can the government enact to address involuntary unemployment? Briefly discuss the tradeoffs of your policy suggestion.
- Recall from class that $n_r = g(\text{workcapacity}_r) = g(f(n_r - 1))$, algebraically derive the elasticity of income with respect to nutrition. Explain the meaning of this term with words.

Imagine that we have survey data of people's food expenditure and their basic income and demographic characteristics (e.g. age, education, etc.)

- Write the linear regression that you would run to answer the question whether people who eat more nutritiously earn more.
- Can the regression estimate tell us whether eating more nutritiously causes higher income? Why or why not?
- Do you predict the coefficient of your regression above to be positive or negative?
- Do you predict the coefficients b and d to be positive or negative if you regress income or nutrition on education?
 $\text{Income}_i = a + b(\text{education}_i) + e$
 $\text{Nutrition}_i = c + d(\text{education}_i) + m$
- How might the results from part (i) and (j) affect the interpretation of the regression you ran in (g)?
- Give two separate examples of measurement error that would cause us to overestimate and underestimate the effect of income on nutrition intake. Explain.

3. Essay exercise: A preview of material to come

For this exercise, please pick one of the questions we generated during the lecture on "The Economic Lives of the Poor" on February 9th regarding demographics, consumption patterns, education, savings, borrowing, employment, and earnings. Identify a part of the syllabus that addresses your selected question. Read 2-3 of the

papers or readings on the syllabus under that section, and write a concise essay (approximately 1 or 2 typed pages) explaining how these papers relate to the selected question.

At the top of the page, list the papers you have read, and clearly state your selected question. Explain how the facts discussed in “The Economic Lives of the Poor” motivate the question you have selected. Discuss how the papers you read help to answer the question—either by explaining a puzzling fact, analyzing a potential cause for a problem, or evaluating a possible solution. Close your essay by briefly summarizing any important aspects of the question that you think these papers did not address.

For your reference, a partial list of potential questions is included below. You are not restricted to the questions on this list; you may select any question that is broadly motivated by our class discussion on February 9th.

Demographic questions

- Why do the poor have so many children? Does poverty cause them to have more children? Or are they poor because they have so many children?
- Does poverty cause high mortality rates? Or does poor health cause poverty?

Consumption questions

- Why are there so many festivals? What is the role of alcohol and tobacco consumption?
- Are the poor malnourished? Do they consume enough calories? Why not?

Education questions

- Why do so many 13-18 year olds drop out of school?
- What explains the gaps in rural/urban schooling expenditures?
- Why is there such a large gap between poor and middle class schooling expenditures?
- Why is there such a large gap between the education attendance of girls and boys?

Savings and borrowing questions

- Why don't the poor accumulate more savings?
- Why are there such big differences in savings behavior across countries?
- What are poor people saving up for?
- Are savings alone sufficient to smooth consumption?
- Why aren't loans effective at fully smoothing consumption?
- Why isn't there a stronger bank presence, given the apparent demand for lending?
- Why do the rich borrow more than the poor?
- Why does everyone own land?

Earnings and Employment

- Why is there so little permanent migration?
- Why do poor people have so many different jobs? Why are so many of them small business owners?