

Homework 2

(Assigned November 23, 2003; Due on November 30, 2003 at 11:00 am in class. Total points: 65. You'll be given 1 bonus point for stapling the homework, and 1 bonus point for clear presentation. The grader reserves the right to assign the presentation point.)

1. The text of the Larry Summers memo presented in class is below. For each of the three points made by him, draw a separate graph to help explain the economic reasoning behind the points made. (25 points)

Just between you and me, shouldn't the World Bank be encouraging MORE migration of the dirty industries to the LDCs [Less Developed Countries]? I can think of three reasons:

1) The measurements of the costs of health impairing pollution depends on the foregone earnings from increased morbidity and mortality. From this point of view a given amount of health impairing pollution should be done in the country with the lowest cost, which will be the country with the lowest wages. I think the economic logic behind dumping a load of toxic waste in the lowest wage country is impeccable and we should face up to that.

2) The costs of pollution are likely to be non-linear as the initial increments of pollution probably have very low cost. I've always thought that under-populated countries in Africa are vastly UNDER-polluted, their air quality is probably vastly inefficiently low compared to Los Angeles or Mexico City. Only the lamentable facts that so much pollution is generated by non-tradable industries (transport, electrical generation) and that the unit transport costs of solid waste are so high prevent world welfare enhancing trade in air pollution and waste.

3) The demand for a clean environment for aesthetic and health reasons is likely to have very high income elasticity. The concern over an agent that causes a one in a million change in the odds of prostrate cancer is obviously going to be much higher in a country where people survive to get prostrate cancer than in a country where under 5 mortality is is 200 per thousand. Also, much of the concern over industrial atmosphere discharge is about visibility impairing particulates. These discharges may have very little direct health impact. Clearly trade in goods that embody aesthetic pollution concerns could be welfare enhancing. While production is mobile the consumption of pretty air is a non-tradable.

The problem with the arguments against all of these proposals for more pollution in LDCs (intrinsic rights to certain goods, moral reasons, social concerns, lack of adequate markets, etc.) could be turned around and used more or less effectively against every Bank proposal for liberalization.

2. (15 points) The widget industry faces the following demand curve for its product:
 $P = 22 - 4W$. W is the quantity of widgets produced, and P is the price that the industry can charge buyers at that quantity. Widgets is a “discrete good” that can only be produced in round numbers, not in fractions.

The cost of producing each widget is \$ 2. Producing each widget leads to \$ 8 in extra pollution damages, and this is external to the industry’s decision.

- (a) Reproduce the following table and fill in all the empty cells. Then plot the Marginal Revenue, Marginal Cost and Marginal Social Cost curves.

Quantity	Total Cost	Marginal Cost	Total Revenue	Marginal Revenue	Total Environmental Cost	Total Social Cost	Marginal Social Cost
1							
2							
3							
4							
5							

- (b) In the absence of regulation, how many widgets will the industry produce? Why? Explain very carefully why the firm will not choose to produce 5 widgets.

- (c) How many widgets would society like to see the industry produce? Why? Explain why there is divergence between the firm’s choice and society’s choice.

- (d) By setting a tax, can the government induce the firm to produce the socially optimal quantity of widgets? If so, what would the size of the tax be and why? If not, why not?

3. (10 points) If you were interested in determining the causes of differences in air pollution levels across countries, what type of a regression would you run? What data would you collect? What would be your regression equation? What signs do you expect the various coefficients to be?

4. (a) Discuss how we can quantify the dollar value of the impact of the AIDS epidemic in an African country. For each method of quantification that you choose, discuss all the steps required to ultimately get a dollar number for the total cost of AIDS.

(8 points)

- (b) What aspects of development will such a dollar measure not capture? In what ways to the quantification methods fall short? (3 points)

5. Draw a capacity curve that takes into account the obesity might deter work capacity. Explain the shapes of the various segments of the curve. (4 points)