

AGSM 5302
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May 2, 2003
due: 3:30 pm, May 16, 2003

Assignment 1

*Note: You may talk to fellow students about the assignment, but **do not copy** others' work. Make whatever assumptions you feel necessary, but state them explicitly.*

- (30) 1. Special care must be taken when evaluating the economic effects of events that occur over time. When reading the accompanying article, pay particular attention to the use of present value calculations in the analysis.
- a. Since the Shoreham nuclear power plant has a value for tax purposes of \$2.5 billion, closing and selling it to the State of New York for \$1 will allow Long Island Lighting Company (Lilco) to deduct the value of the plant as a loss on their federal tax. What is the undiscounted value of this tax loss? Is this the (present) value of this loss in revenue to the government? Explain.
 - b. It is interesting to consider the value of this tax loss from the point of view of Lilco. Is it the same to both Lilco and the federal government? Could the government and Lilco strike a deal that would let Lilco write off a smaller total amount over a shorter period of time? Explain. (Hint: do they have the same discount rates?)
 - c. The author of the article goes on to argue that even the present value of the tax loss overstates the actual revenue loss to the government. What is his reasoning? Relate your answer to the concept of opportunity cost and depreciation losses.
 - d. The governor of the State of New York has offered a sweetener to the deal: a \$110 million reduction in the gross taxes paid by Lilco's customers. Is this deal worth \$110 million to Lilco's customers? Why?
 - e. Then, there is the matter of property taxes. Whatever the merits of a nuclear power plant, it adds tremendously to local property tax revenues. What effects does shutting down Shoreham have on the demand curve for housing in the surrounding community? What net effect do you think shutting down

Shoreham will have on property values?

- f. Who are the winners and who the losers from the closure?
Briefly explain how you would determine whether or not there is a net gain to society.

(20) 2. Briefly (one or two paragraphs on each) answer all parts:

- a. Compare the two decision criteria of the Net Present Value of a project with its Internal Rate of Return: why is using one preferable to the other?
- b. If you were considering several projects which could be undertaken separately or together, how would you determine which to undertake, if your capital outlay were rationed? Explain.
- c. What is the main shortcoming of the Payback Method of comparing alternative projects?
- d. Project A has an outlay of \$1m and when using a discount rate of 10% p.a. to reflect its risk, it has an NPV of +\$20,000. Project B has an outlay of \$10m and when discounted at 15% p.a. to reflect its risk has an NPV of +\$15,000. If A and B are mutually exclusive, which project should be accepted? Explain.

(20) 3. Briefly (one or two paragraphs on each) answer all parts:

- a. In times of relatively high unemployment, it seems only natural that projects which will employ large numbers of people should be touted as admirable.

Under CBA, should a project be accepted because it employs many people, *cet. par.*? If not, then how should a CBA differ from a Financial Appraisal in dealing with the fact that some fraction of the people to be employed on a project would otherwise be unemployed?

- b. The following table comes from page 30 of the Dept. of Finance *Handbook*:

Supply/demand	Produce output	Consume input
Incremental	Observed market price	Observed market price less taxes
Displaced	Observed market price less taxes	Observed market price

Explain the rationale behind these shadow prices. (Hint: think of the opportunity costs.)

- c. A project will hire 200 skilled workers: 50 will be diverted from elsewhere, and their previous employer has been paying \$500 a week for them (including 20% tax); the rest will give up their taxi-driving jobs (they will reenter the skilled labour market). What shadow price should CBA analysts use for these workers?

- (30) 4. Consider a project that costs \$200,000 in year 0 and yields an annual return of \$60,000 for five years (in years 1, 2, 3, 4, and 5). In year 5, there is also a cost of \$40,000 to dispose of the waste from the project and zero income. Should the project be undertaken if the discount rate is: (a) 0% p.a.? (b) 10% p.a.? (c) 15% p.a.? Why?

Assume that the government has a choice now between undertaking the smaller project described above and undertaking a larger project. If it spends an additional \$200,000, returns will be increased by \$50,000 per year and disposal costs in year 5 will increase by \$40,000. Which project (the smaller or the larger) should be undertaken if the discount rate is (d) 0% p.a.? (e) 10% p.a.? (f) 15% p.a.? Why?