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OLLSCOIL NA hÉIREANN, GAILLIMH
NATIONAL UNIVERSITY OF IRELAND, GALWAY

Summer Examinations 2002

Cost Benefit Analysis (EC226)

2nd Year B.A. (Economic and Social Studies) – St. Angela's College, Sligo

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TIME ALLOWED: TWO HOURS
MARKS: 200

Instructions: This exam consists of three sections. Students must attempt all sections

Section A (60 Marks): Answer **FIVE** questions (worth 12 marks each)

Section B (90 Marks): Answer **QUESTION 1** (worth 40 marks) and **ONE OTHER QUESTION** (worth 50 marks)

Section C (50 Marks): Answer **ONE** question (worth 50 marks)

Section A

1. There are four types of Cost-Benefit Analysis. Name three and explain when they are used.

2. Define and explain the concept of Pareto efficiency.

3. Define and explain the concepts of willingness to pay and opportunity costs and how they are used in cost benefit analysis.

4. What is the decision rule in cost-benefit analysis when:
   a. all projects are independent
   b. when projects enhance or interfere with each other
   c. when projects are mutually exclusive

5. Define and explain benefit-cost ratios. Are there any drawbacks to using this method for evaluating projects?

6. Define consumer surplus, producer surplus and social surplus.

7. Deadweight losses occur due to asymmetric information and in some cases there is a role for the government to provide the missing information. Define each of the following three types of goods and give examples. Should the government intervene to provide information about these goods?
   a. search goods
   b. experience goods
   c. postexperience goods

8. There are five alternative ways of measuring terminal values. List and explain four of them.

9. What type of cost-benefit analysis was used in the study " A Cost-Benefit Analysis of the High Speed Train in Spain"? List the costs and benefits associated with the high-speed train.

10. Outline and briefly describe the methodology used to estimate the benefits of preserving the northern spotted owl in the study "A Cost-Benefit Analysis of the Northern Spotted Owl".

Section B

1. A government data processing center has been plagued in recent years by complaints from employees of back pain. Consultants have estimated that upgrading office furniture at a cost of €425,000 would reduce the incidence and severity of back injuries, allowing the center to avoid annual medical costs of €68,000 each year. They estimate that the new furniture would also provide yearly benefits of avoided losses in work time and employee comfort worth €18,000. The furniture would have a useful life of five years, after which it would have a positive salvage value equal to 10% of its initial cost. Avoided costs occur at the end of the year.
   a. If the discount rate is 5% should the center purchase the new furniture?
   b. If the discount rate if 3% should the center purchase the new furniture?

1. Suppose the market demand for concrete is known to be $Q = 75 - 1P$ and the supply curve is $Q = -100 + 4P$. (P = price measured in €, Q = quantity measured in thousand tons). Now suppose the government decides to undertake a new road building programme that increases the demand for concrete by 25,000 tons. Assuming the supply curve for concrete is upward sloping find:
   a. the initial equilibrium price and quantity
   b. the new equilibrium price and quantity
   c. the net social cost of the project

3. A country imports 60,000 barrels of crude oil per year and domestically produces another 60,000 barrels of crude oil per year. The world price of crude oil is $24 per barrel. Assuming linear schedules, economists estimate the price elasticity of domestic supply to be 0.25 and the price elasticity of domestic demand to be 0.1 at the current equilibrium.

   Consider the changes in social surplus that would result from imposition of a $8 per barrel import fee on crude oil that would involve annual administrative costs of $50,000. Assume that the world price will not change as a result of the country imposing the import fee, but that the domestic price will increase by $8 per barrel. Also assume that only producers, consumers and taxpayers within the country have standing. Determine the quantity consumed, the quantity produced domestically, and the quantity imported after the imposition of the import fee. Then estimate the annual social net benefits of the import fee.

1. Suppose that the demand for personal alarms among elderly people is known to be $Q = 75 - P$ and the supply curve is $P = 50 + Q$. Now say the government decides to lower the price of alarms to help elderly people, so it gives a subsidy of €50 per alarm. Find
   a. the presubsidy equilibrium price and quantity
   b. the postsubsidy equilibrium price and quantity
   c. the net cost to society of the subsidy, assuming that the presubsidy curves properly reflected social benefits and costs.

Section C

1. Flooding has become a major problem in certain parts of the country in recent years, particularly during the winter months. The government has considered introducing flood relief schemes or drainage schemes in some of the worst affected areas of the country to alleviate the problem. Based on the two cost-benefit studies "An Economic Evaluation of a Flood Relief Scheme at Sixmilebridge, Co. Clare" and "Benefits of Mulkear (Ballymackeogh) Certified Drainage Scheme", outline the benefits and costs that should be included in a cost-benefit analysis of flood relief schemes. Outline how these costs and benefits were estimated in the two studies concerned. Were there difficulties in obtaining estimates of any of the costs or benefits in these studies? If so, how were they overcome?

2. The Special Olympics will be held in Ireland next year. A socio-economic cost-benefit analysis was undertaken in 1997 to provide a comparison of the costs to the Irish economy of hosting the event with the economic benefits. Explain how the analysis was conducted. Were all relevant costs and benefits included? If not, explain why. Does this significantly affect the result in any way?

3. Peter Bacon and Associates produced a report in August 1999 for the National Safety Council of Ireland. This report contains an economic assessment and a preliminary cost benefit analysis of the government strategy for road safety 1998-2002. Outline the costs and benefits considered in this study and explain how these were estimated. What are the main conclusions and recommendations of this report?