

OLLSCOIL NA hÉIREANN, GAILLIMH  
NATIONAL UNIVERSITY OF IRELAND, GALWAY

Autumn Examinations 2002

**Cost-Benefit Analysis (EC226)**

2<sup>nd</sup> 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. A sensitivity analysis is often carried out in cost-benefit analysis studies. Explain what a sensitivity analysis is and why it is undertaken.
2. Define Net Present Value and explain how it is estimated.
3. Define consumer surplus, producer surplus and social surplus and illustrate them in a diagram.
4. Define and explain deadweight loss.
5. What are the rationales for conducting a cost-benefit analysis?
6. There are five alternative ways of measuring terminal values. List and explain four of them
7. Define and explain the concept of willingness to pay. How can it be measured and why might it differ across individuals?
8. There are four types of cost-benefit analysis. Name three and explain when they are used.

9. 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.
10. Briefly explain each of the following:
- ex-ante cost benefit analysis
  - mutually exclusive projects
  - opportunity cost

### Section B

1. A government department is considering purchasing a new information system that costs €320,000 to purchase and set up initially and €30,000 to operate and maintain each year. The benefits of the system are estimated to be €100,000 per annum including cost savings and user benefits.
- If the system can be dismantled and sold for €20,000 after 6 years and the discount rate is 7% should the government department install the new system? Assume annual costs and benefits occur at the end of the year.
  - If the system cannot be sold and it costs €10,000 to dismantle it after 6 years and the discount rate is 6% should the government department install the new system? Assume annual costs and benefits occur at the end of the year.
2. Suppose the market demand curve for concrete is known to be  $Q = 150 - 2P$  and the supply curve is  $Q = -200 + 5P$ . Now suppose the government decides to undertake a new road building programme that increases demand for concrete by 35 tons. Assuming the supply curve for concrete is upward sloping find:
- the initial equilibrium price and quantity
  - the new equilibrium price and quantity
  - the net social cost of the project
3. A country imports 5,000 tons of grain per year and domestically produces another 10,000 tons. The world price of grain is €200 per ton. Assuming linear schedules economists estimate the price elasticity of domestic supply to be 0.4 and the price elasticity of demand to be 0.28 at the current equilibrium. Consider the changes in social surplus that would result from the imposition of a €25 per ton import fee on grain that would involve annual administrative costs of €30,000. 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 €25. 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 benefits of the import fee.

4. Suppose the demand for a good is known to be  $Q = 150 - P$  and the supply curve is  $P = 100 + Q$ . Now say the government decides to lower the price of the good to help consumers, so it gives a subsidy of €20 per unit. Find:
  - a. the pre-subsidy price and quantity equilibrium
  - b. the change in consumer surplus as a result of the subsidy
  - c. the change in producer surplus
  - d. the net cost to society, assuming that the pre-subsidy curves properly reflected social benefits and costs

### Section C

1.
  - a. 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'.
  - b. What type of cost-benefit analysis was used in the study 'A Cost-Benefit Analysis of the High Speed Train in Spain'? Outline the costs and benefits associated with the high-speed train and explain how these costs and benefits were estimated in the study.
2. 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 and benefits in these studies? If so, how were they overcome?
3. 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. Outline the costs and benefits associated with hosting the games and explain how these costs and benefits were estimated in the study. Were all costs and benefits included in the study? If not, how did this affect the results of the study?