



Term Paper Assignment

Cost-Benefit Analysis of a Mass Transit

Generating Parameters

- Before you start working on the Term Paper you need to develop some parameters (numbers).
- You may use your Social Security Number (SSN) or any other unique number that has 9 single digits.
- Everyone will have to have a unique 9 digit number (i.e., two person can not have the same number). You will need to email your 9 digit no. and get it approved.
- Write down your 9 digit number which will look like as follows:
$$X_1 \ X_2 \ X_3 \ X_4 \ X_5 \ X_6 \ X_7 \ X_8 \ X_9$$
- You need to generate another parameter, X_{10}
$$X_{10} = X_1 + X_2 + X_3 + X_4 + X_5 + X_6 + X_7 + X_8 + X_9$$
- You will working on term paper assignment with these ten parameters
- The complete instruction is available Online (ask me if you need any more clarification)

Benefit-Cost Analysis for MDTA

- The Metro Dade Transit Authority (MDTA) is considering to extend its metro rail service to Southwest Dade including Homestead.
- The project involves a large startup costs that have to be financed through selling new bonds.
- If the project does not go well, the ultimate burden of the project would fall on city tax payers. So tax payers in general are not very excited about the project.
- But city commuters & local environmentalists are in favor, as it would reduce time wasted in traffic, reduce pollution and energy consumption.
- You're provided with the some technical and economic data to perform a Benefit-Cost Analysis for MDTA.

Conducting Benefit-Cost Analysis

- You're asked to conduct an analysis of with and without the Project
- Financial Benefit-Cost Analysis
- Socio-economic Benefit-Cost Analysis

Information Provided

- Population and corresponding growth rate
- Number of Passenger Trip (PT), Distance Travelled and gas cost
- Annual operating cost (fixed & variable cost)
- Compensation to be made to property owners
- Times Saved on Passenger Trip (PT)
- Household's Willingness to Pay for Improved Air Quality
- Discounting Rate

Answer the following questions

1. List costs and benefit items under each of the two B-C analyses. Explain why there are differences bet. two analyses. Study the spreadsheet in detail before you answer this question.

2. Explain how the following concepts have been applied to the B-C analysis (you need to explain the following concepts in terms of actual numbers that you get from your worksheet. Hint: reading chapters 8, 9 & 10 might help in answering this question).
 - a. Opportunity cost principle
 - b. Non-market benefits
 - c. With and without principle
 - d. Operation and maintenance costs
 - e. Public goods
 - f. Damage compensation

3. Compute Internal Rate of Returns (IRR) for the project (financial and socio-economic), using the worksheet.
- IRR: The discount rate that makes the net present value (NPV) of all cash flows from a project equal to zero.
 - $$NPV = NB_0 / (1+r)^0 + NB_1 / (1+r)^1 + \dots + NB_t / (1+r)^t$$
$$= 0 \text{ (i.e., find out the } r \text{ at which } NPV=0)$$
 - This video clip shows you how to calculate IRR in Excel
<http://www.youtube.com/watch?v=PJwBesPTnBQ>

4. Present (using appropriate tables) the main results of your analysis:

Total (30 years) discounted and undiscounted benefits and costs, net present values, B-C ratios and IRRs for both analyses. Make recommendations to the MDTA Director as to whether the project is financially and economically viable or not, with justification.

Your justification should point to some of the economic principles that we discussed. Also, the recommendation must indicate important project indicators such as benefit-cost ratio, net present values, and internal rate of return. Make sure to explain why you conducted the three types of analyses, what the differences are, etc.

5. Discuss any two funding mechanisms for raising money for this project.