CBA Exercise 2: Discounting

The City Council is considering redeveloping part of an old country home into an enterprise training centre. The centre will be used to train local people in a number of occupations, and will also be used to host conferences, weddings and other functions.

The council has used a team of researchers to gather data on the costs and benefits involved in the project. These include the direct costs and benefits, the cost of construction for example, and also the indirect costs and benefits including the aesthetic improvements to the local area from having a derelict building redeveloped.

The council now need the data to be compiled and the project to be appraised using CBA.

The costs and benefits of the project are detailed in the table below:

Cost	Value (£)	Period	Benefit	Value (£)	Period
Planning and site purchase	500,000	0	Improved education of local young people	800,000	3 and ongoing
Site demolition and clean-up	200,000	1	Job creation in development	100,000	1
Construction	1.1m	2	Job creation from staffing	400,000	2
Pollution during demolition and construction	150,000	1 and 2	Job creation from staffing	100,000	3
Staff wages	400,000	2 and ongoing	Revenue	750,000	2 and ongoing
Training	50,000	2	Aesthetic improvement in local area	200,000	2 and ongoing
Maintenance	100,000	2 and ongoing			
Running costs including electricity, heating etc.	40,000	2 and ongoing			

The council require you to complete the following tasks:

a) Calculate the nominal net present value of the project in the first three years.

Nominal costs =

Nominal benefits =

Nominal NPV =

b) Assuming an interest/discount rate of 5%, discount the costs of maintenance for the first three years of the project (from year 1 to 3).

c) Again assuming an interest rate of 5%, discount the revenue benefits from the project for the first three years of the project.

d) Calculate the remaining costs and benefits for the first three years (include any costs/benefits occurring in year 0), assuming an interest rate of 5%.

e) Calculate the NPV of the costs and benefits. Should the project go ahead?

f) How does the result differ from the nominal result?

g) Now calculate the costs and benefits for the first five years. Does this affect the viability of the project?

Note: The following formulas should be used in this exercise for discounting future values to present values:

(a) discounting to present value

$$P = \frac{F}{(1 + r)^n}$$

(b) discounting multiple periods (years)

$$P = \sum \frac{F}{(1 + r)^n}$$

Or

$$P = \frac{F}{(1 + r)^0} + \frac{F}{(1 + r)^1} + \ldots + \frac{F}{(1 + r)^n}$$