



## CBA Exercise 4: Project Options and CBA

The following formulas will be needed to complete this exercise:

- (a) discounting to present value

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

- (b) discounting multiple periods (years)

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

### Project Brief

You are required to perform a project appraisal which considers a range of options for a redevelopment project of a derelict industrial site in a city centre, which the local council are seeking to redevelop. In groups you need to consider each of the options the council is considering and answer the questions below to provide a project appraisal. The project options all have associated costs and benefits which need to be considered in appraising the options. There are also a number of further considerations which you will have to account for in your final appraisal (and choice of project) which are not outlined explicitly below.



The primary option being considered by the local council is to demolish the current site and build eight industrial units. These will be

rented to businesses including mechanics, logistics, and others. The option of industrial units is popular with the council as it is considered a relatively cheap option. However, it is likely to result in substantial congestion, noise and air pollution in the area surrounding the site, which is near a housing estate. The council is open to other ideas and would consider the site being redeveloped into either: an enterprise training centre (ETC); a leisure centre; small shopping centre, or; luxury apartments.

The ETC would be housed inside the current factory buildings on the site, requiring a number of alterations to the main structure. The idea of the ETC is popular with the council as it will be used to train local young people and help them to start up their own businesses with the guidance of skilled staff at the centre. A small shopping centre would provide additional space for up to 10 small to medium-sized retail outlets in the local area. Another option would be to convert the factory into luxury apartments. This option requires some major structural changes to the building, but uses the existing outer shell of the building. This option is popular with the council as it should create substantial revenues in the short term. A final option for the council would simply be to sell the site to a private sector developer. This would generate an immediate revenue for the council, and could provide benefits similar to

those of some of the other project options. However, impacts are uncertain due to the eventual use of the site being unknown at this time.

### **Project Options: Costs and Benefits**

A number of costs and benefits have already been estimated by the council, and are as follows:

#### *Industrial Units*

- Demolition costs: £200,000 (occurring in year 0).
- Building costs: £2m (occurring in year 0).
- Job creation: £0.3m per year (occurring in years 1-5).
- Income from business rates: £270,000 per year (beginning in year 1).
- Unit maintenance: £100,000 per year (beginning in year 1).
- Multiplier effect on local economy: £2.2m (one-off estimate provided by local economists).

#### *Enterprise Training Centre*

- Building costs: £2.8m (occurring in year 0).
- Staffing for ETC: £0.2m per year (beginning in year 1).
- Training benefits and job creation: £0.25m per year (beginning in year 2)
- Building maintenance: £10,000 per year (beginning in year 1).
- Multiplier effect on local economy: £5.2m (one-off estimate provided by local economists).

#### *Shopping Centre*

- Building costs: £3.5m (occurring in year 0).
- Job creation: £0.2m per year (occurring in years 1-5).
- Income from business rates: £350,000 per year (beginning in year 1).
- Unit maintenance: £150,000 per year (beginning in year 1).
- Multiplier effect on local economy: £1.7m (one-off estimate provided by local economists).

#### *Luxury Apartments*

- Building costs: £4.2m (occurring in year 0).
- Advertising and estate agents costs: £40,000 (occurring in years 0-3).
- Income received from sale of apartments: approximately £2.35m per year (occurring in years 1-3). Note: the

exact value is dependent on speed and value of sales.

- Multiplier effect on local economy (from consumption of individuals living in apartments): £1.5m (one-off estimate provided by local economists).

#### *Site Sale*

- Expected sale price between £1.5-2m (in year 0).
- Other impacts uncertain as eventual site use unknown.

### **Questions**

1. Outline each of the project options being considered, including discussion of potential strengths and limitations.
2. Identify any costs and benefits in the list provided by the council which will pose problems with quantification and/or accuracy. Outline methods which could be used to resolve these difficulties.
3. Using the quantified costs and benefits provided by the council in the project brief, a project period of 10 years, and the *Green Book* recommended discount rate of 3.5%, calculate the NPV and BCR associated with each project option.
4. If a discount rate of 1.5% is used, how does this affect the project outcome?
5. What other potential costs and benefits may need to be considered before a final appraisal of the project can be delivered?
6. Based on your appraisal, order the project options in respect to which is the most preferable option (numbered 1), and least preferable (numbered 5). Explain your ranking of each option.

### **References**

- HM Treasury, 2011. *The Green Book: Appraisal and Evaluation in Central Government* [online]. Available at: [http://www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)