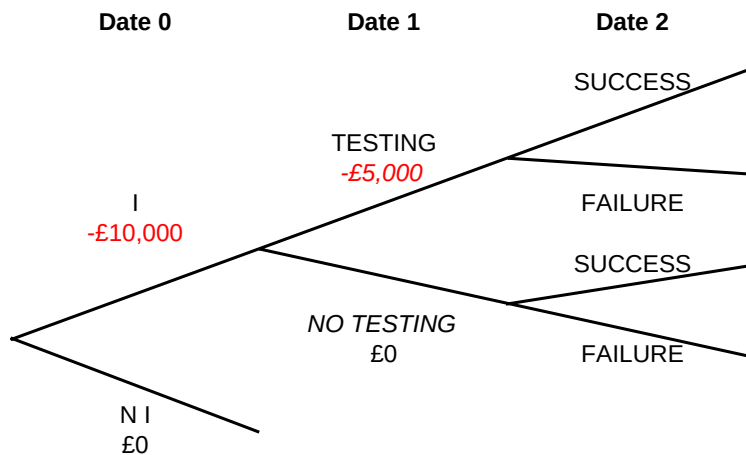


Solution: Decision Tree exercise

A) & B)



1. Determination of Cash Flows

	Success	Failure
Revenue	10,000	5,000
Variable Cost	-2,000	-1,000
Fixed Cost	-2,000	-2,000
Net Cash Flow	6,000	2,000

2. Date 1's NPVs

If testing

$$\begin{aligned} \text{NPV}_s &= -I + \text{PV CF}_s \\ &= -5,000 + (6,000 / 0.10) \\ &= 55,000 \end{aligned}$$

$$\begin{aligned} \text{NPV}_f &= -I + \text{PV CF}_f \\ &= -5,000 + (2,000 / 0.10) \\ &= 15,000 \end{aligned}$$

$$\begin{aligned} \text{Expected NPV} &= (0.80 * 55,000) + (0.20 * 15,000) \\ &= 47,000 \end{aligned}$$

If not testing

$$\begin{aligned} \text{NPV}_s &= -I + \text{PV CF}_s \\ &= -0 + (6,000 / 0.10) \\ &= 60,000 \end{aligned}$$

$$\begin{aligned} \text{NPV}_f &= -I + \text{PV CF}_f \\ &= -0 + (2,000 / 0.10) \\ &= 20,000 \end{aligned}$$

$$\begin{aligned} \text{Expected NPV} &= (0.50 * 60,000) + (0.50 * 20,000) \\ &= 40,000 \end{aligned}$$

3. Date 0 Investment Decision

If testing

$$\begin{aligned} \text{NPV} &= -I + \text{PV CF} \\ &= -10,000 + (47,000 / 1.10) \\ &= \underline{\underline{32,727}} \end{aligned}$$

If not testing

$$\begin{aligned} \text{NPV} &= -I + \text{PV CF} \\ &= -10,000 + (40,000 / 1.10) \\ &= 26,364 \end{aligned}$$

C) PESSIMISTIC SCENARIO

Date 1's NPVs

If testing

$$NPV_s = 55,000$$

$$NPV_f = 15,000$$

Expected NPV

$$= (0.60 * 55,000) + (0.40 * 15,000) \\ 39,000$$

If not testing

$$NPV_s = 60,000$$

$$NPV_f = 20,000$$

Expected NPV

$$= (0.50 * 60,000) + (0.50 * 20,000) \\ \underline{\underline{40,000}}$$

D) OPTIMISTIC SCENARIO

	Success	Failure
Revenue	10,000	5,000
Variable Cost	-4,000	-2,000
Fixed Cost	-2,000	-2,000
Net Cash Flow	4,000	1,000

Date 1's NPVs

If testing

$$NPV_s = -I + PV CF_s \\ - 5,000 + (4,000 / 0.10) \\ 35,000$$

$$NPV_f = -I + PV CF_f \\ - 5,000 + (1,000 / 0.10) \\ 5,000$$

Expected NPV

$$= (1 * 35,000) + (0 * 5,000) \\ 35,000$$

If not testing

$$NPV_s = -I + PV CF_s \\ - 0 + (4,000 / 0.10) \\ 40,000$$

$$NPV_f = -I + PV CF_f \\ - 0 + (1,000 / 0.10) \\ 10,000$$

Expected NPV

$$= (0.50 * 40,000) + (0.50 * 10,000) \\ 25,000$$

Date 0 Investment Decision

If testing

$$NPV = -I + PV CF \\ - 10,000 + (35,000 / 1.10) \\ \underline{\underline{21,818}}$$

If not testing

$$NPV = -I + PV CF \\ - 10,000 + (25,000 / 1.10) \\ 12,727$$

