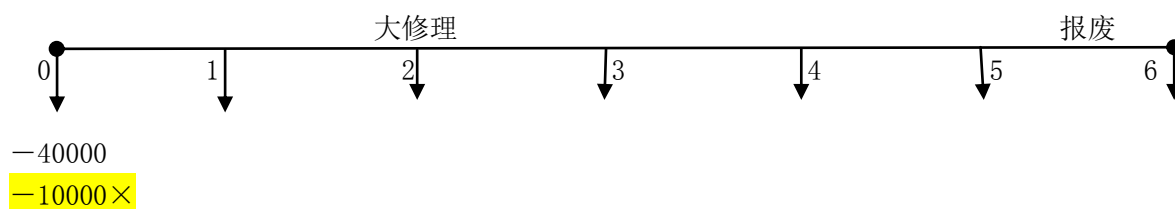


●教材【例 6-13】

【板书】保留旧设备方案



$$(1) NCF_0 = -\frac{40000}{\text{变现收入}} - \frac{(54000 - 40000) \times 40\%}{\text{变现净损失抵税}} = -45600$$

$$(2) NCF_1 = \frac{-13000 \times (1 - 40\%)}{\text{税后付现成本}} + \frac{10000 \times 40\%}{\text{折旧抵税}} = -3800$$

$$(3) NCF_2 = \frac{-13000 \times (1 - 40\%)}{\text{税后付现成本}} + \frac{10000 \times 40\%}{\text{折旧抵税}} - \frac{18000 (1 - 40\%)}{\text{税后大修理支出}} = -14600$$

$$(4) NCF_{3-5} = \frac{-13000 \times (1 - 40\%)}{\text{税后付现成本}} + \frac{10000 \times 40\%}{\text{折旧抵税}} = -3800$$

$$(4) NCF_6 = -13000 \times (1 - 40\%) \quad \text{——税后付现成本}$$

$$+ 5500 \quad \text{——残值收入}$$

$$- (5500 - 4000) \times 40\% \quad \text{——残值净收益纳税}$$

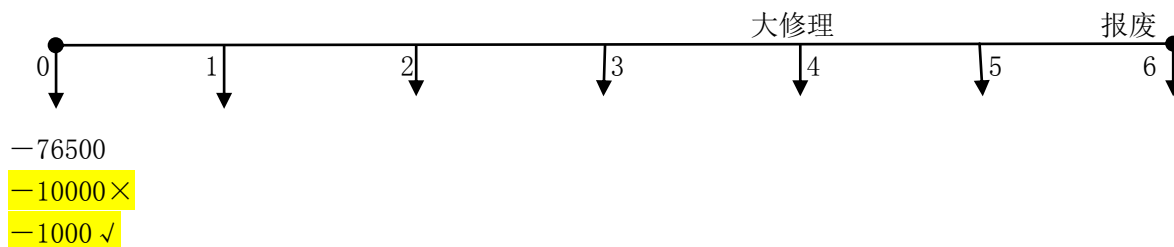
$$+ 10000 \quad \text{——营运资金收回}$$

$$= 7100$$

【提示】 NCF_6 无折旧抵税。

$$\text{所以: } NPV = -45600 - 3800 \times (P/F, 10\%, 1) - 14600 \times (P/F, 10\%, 2) - 3800 \times (P/A, 10\%, 3) \times (P/F, 10\%, 2) + 7100 \times (P/F, 10\%, 6) = -64921.73$$

【板书】购买新设备方案



$$(1) NCF_0 = - \frac{76500}{\text{购买价款}} - \frac{1000}{\text{垫支营运资金}} = -77500$$

$$(2) NCF_{1-3} = \frac{-7000 \times (1-40\%)}{\text{税后付现成本}} + \frac{12000 \times 40\%}{\text{折旧抵税}} = +600$$

$$(3) NCF_4 = \frac{-7000 \times (1-40\%)}{\text{税后付现成本}} + \frac{12000 \times 40\%}{\text{折旧抵税}} - \frac{9000 \times (1-40\%)}{\text{税后大修理支出}} = -4800$$

$$(4) NCF_5 = \frac{-7000 \times (1-40\%)}{\text{税后付现成本}} + \frac{12000 \times 40\%}{\text{折旧抵税}} = +600$$

$$(5) NCF_6 = -7000 \times (1-40\%) \text{———税后付现成本}$$

$$+ 12000 \times 40\% \text{———折旧抵税}$$

$$+ 6000 \text{———残值收入}$$

$$- (6000 - 4500) \times 40\% \text{———残值净收益纳税}$$

$$+ 11000 \text{———营运资金收回}$$

$$= 17000$$

$$\text{所以: } NPV = -77500 + 600 \times (P/A, 10\%, 3) - 4800 \times (P/F, 10\%, 4) + 600 \times (P/F, 10\%, 5) + 17000 \times (P/F, 10\%, 6) = -69317.22$$

年金成本的计算公式推导:

$$\begin{aligned} \text{年金成本} &= \frac{\sum (\text{各项目现金净流出值})}{\text{年金现值系数}} \\ &= \frac{\text{原始投资额} - \text{残值收入} \times \text{一般现值系数} + \sum (\text{年营运成本现值})}{\text{年金现值系数}} \\ &= \frac{\text{原始投资额} - \text{残值收入}}{\text{年金现值系数}} + \text{残值收入} \times \text{贴现率} + \frac{\sum (\text{年营运成本现值})}{\text{年金现值系数}} \\ &= \text{年投资净额} + \text{年营运成本} \end{aligned}$$

【推导】

$$\begin{aligned} \text{年金成本} &= \frac{\text{原始投资额} - \text{残值收入} \times \text{一般现值系数} + \sum (\text{年营运成本现值})}{\text{年金现值系数}} \\ &= \frac{\text{原始投资额} - \text{残值收入} + \text{残值收入} \times \text{一般现值系数} + \sum (\text{年营运成本现值})}{\text{年金现值系数}} \end{aligned}$$

$$\begin{aligned}
&= \frac{\text{原始投资额} - \text{残值收入} + \text{残值收入} \times (1 - \text{一般现值系数}) + \sum (\text{年营运成本现值})}{\text{年金现值系数}} \\
&= \frac{\text{原始投资额} - \text{残值收入}}{\text{年金现值系数}} + \frac{\text{残值收入} \times (1 - \text{一般现值系数})}{\text{年金现值系数}} + \frac{\sum (\text{年营运成本现值})}{\text{年金现值系数}} \\
&= \frac{\text{原始投资额} - \text{残值收入}}{\text{年金现值系数}} + \text{残值收入} \times \text{贴现率} + \frac{\sum (\text{年营运成本现值})}{\text{年金现值系数}}
\end{aligned}$$

附: $\frac{1 - (P / F, i, n)}{(P / A, i, n)} = i$

●教材【例 6-15】

【答案】

旧设备年金成本 = 年投资净额 + 年营运成本

$$\begin{aligned}
&= \frac{10000 - 3500 \times (P / F, 15\%, 6)}{(P / A, 15\%, 6)} + \frac{10500 \times (P / A, 15\%, 6)}{(P / A, 15\%, 6)} \\
&= \frac{10000 - 3500 \times (P / F, 15\%, 6)}{(P / A, 15\%, 6)} + 10500 \\
&= 12742.76 \text{ (元)}
\end{aligned}$$