DP IB Business Management: SL

Your notes

3.7 Investment Appraisal

Contents

Simple Payback Period

Your notes

Introduction to Investment Appraisal

- Investment appraisal involves comparing **the expected future cash flows of an investment with the initial expenditure** on that investment
- A business may want to analyse
  - **How soon** the investment will recoup the initial outlay
  - **How profitable** the investment will be
- Before an investment can be appraised key data will need to be collected, including
  - Sales forecasts
  - Fixed and variable costs data
  - Pricing information
  - Borrowing costs
- The collection and analysis of this data is likely to **take some time**
  - It requires **significant experience** to interpret the data appropriately **before the investment appraisal can take place**
- Two methods **used to appraise the value of an investment**, include:
  - The simple payback period
  - The average rate of return (ARR)

Simple Payback Period

- The payback period is a calculation of the **amount of time** it is expected an investment will **take to pay for itself**
- Where **net cash flows** are expected to be **constant over time,** the payback period can be calculated using the formula

$$\frac{\text{Initial Outlay}}{\text{Net Cash Flow per Period}} = \text{Years / Months}$$

Your notes

Worked Example

1. Simple Payback Calculation

Gomez Carpets is considering an investment in a new storage facility at a cost of $200,000. It expects additional net cash flow of $30,000 per year as a result of the investment.

Calculate the Payback period for the investment. [3]

Answer:

Step 1 – Substitute the values into the formula

$$\frac{\$\,200,000}{\$\,30,000} = 6.67 \text{ years}$$ **[1 mark]**

Step 2 – Convert the outcome to years and months

6 years

0.67 years = 8.04 months **[1 mark]**

Payback period = 6 years and 8 months **[3 marks for the correct answer]**

Worked Example

2. Payback calculation for varying cash flow over time

Hammer and Son provides a household repairs service that has recently employed a new handywoman who requires her own van. The new van will be purchased for $32,000

The net cash flows are expected to vary over the five years following its purchase and are shown in the table below.

Year	Net cash Flow ($)	Cumulative Cash Flow ($)
0	(32,000)	(32,000)
1	14,000	(18,000)
2	10,000	(8,000)
3	6,000	(2,000)
4	3,000	1,000

5	2,000	3,000

Calculate the payback period for the van. [4]

Answer:

Step 1 – Identify the final year where the cumulative cash flow is negative

In this case, the cumulative cash flow figure is -$2,000 at the end of Year 3

This is the remaining amount (outlay) outstanding. **[1 mark]**

Step 2 – Calculate the monthly net cash flow for the next year (year 4)

$3,000 ÷ 12 (months) = $250 **[1 mark]**

Step 3 – Divide the remaining amount outstanding by the monthly net cash flow

$2000 ÷ $250 = 8 months **[1 mark]**

Step 4 – Identify the payback period

In this case the Payback period is 3 years and 8 months **[1 mark]**

Evaluation of the Payback Method

Advantages	Disadvantages
▪ It is a **simple method** to calculate and understand ▪ It is particularly useful for businesses where **cash flow management** is vital ▪ Businesses can **identify the point** at which an investment is paid back and **contribute positively** to cash flow ▪ It is also useful when **new technology** is introduced regularly ▪ Businesses purchasing equipment can calculate whether an investment 'pays back' **before an upgrade is available**	▪ It provides **no insight** into the **profitability of investments** ▪ Payback only considers the total length of time to **recover an investment** ▪ Neither the timing nor the **future value of cash inflows** is considered ▪ This method may encourage a **short-termism** approach ▪ Potentially lucrative **investments may be dismissed** as they take longer to pay back than alternatives

Your notes

Your notes

Average Rate of Return (ARR)

- The Average Rate of Return compares the average **profit** per year generated by an investment with the value of the **initial capital cost**
- The average rate of return is calculated using the formula and is **expressed as a percentage**
  - This makes it easy to **compare different investment options**

$$\frac{(\text{total returns} - \text{capital cost}) \div \text{years of use}}{\text{capital cost}} \times 100$$

Worked Example

Creative Frames, a small artwork framing business based in Bermuda, is considering an investment of $40,000 in new machinery. Megan, the business owner, believes that total returns over a 6-year period will be $76,000

Calculate the Average Rate of Return of the proposed investment. [4 marks]

Answer:

Step 1 - Deduct the capital cost from the total returns

$76,000 - $40,000 = $36,000 **[1 mark]**

Step 2 - Divide the outcome by the number of years of use

$36,000 ÷ 6 years = $6,000 **[1 mark]**

Step 3 - Substitute the values into the formula

$$= \frac{6{,}000}{40{,}000} \text{ x } 100$$

[1 mark]

$$= 0.15$$

Step 4 - Multiply the outcome by 100 to find the percentage

0.15 x 100 = 15% **[1 mark]**

Evaluation of Average Rate of Return (ARR)

Advantages	Disadvantages
▪ ARR considers **all of the net cash flows** generated by an investment over time ▪ ARR is easy to understand and compare the percentage returns with each other	▪ As it depends on an average of cash flows **it ignores the timing of those cash flows** ▪ The **opportunity cost** of the investment is ignored as values are neither expressed in **real terms** nor adjusted for the impact of interest rates and time


Your notes

Limitations of using Investment Appraisal

- Each of the investment appraisal techniques **relies upon forecasted future cash flows** which may **lack accuracy**
  - Managers compiling cash flow forecasts may lack experience or may be biased towards a particular investment
  - Incomplete past data may make forecasting imprecise or mean that **confidence** in the data used to compile the forecast is limited
- **Longer-term forecasts** used to predict **returns on investments** are particularly **prone to inaccuracy** for a variety of reasons
  - Unexpected increases in **costs**
  - The arrival of **new competitors**
  - Changes in **consumer tastes**
  - Uncertainties arising as a result of economic growth or **recession**
- Factors other than the cost of investment and the return on investment are not considered
  - Business finances and availability of external finance to fund the investment
  - The overall **corporate objectives**
  - Potential for positive **public relations** or meeting **social responsibilities**