Management Accounting

Investment Appraisal

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Investment Appraisal

- Business managers need to make choices about which project or opportunity to invest in.
- Thus the term investment appraisal.
- There are both quantitative and qualitative techniques to help inform decision makers.

Investment Appraisal

Why do companies invest?

- Importance of remembering investment as the purchase of productive capacity NOT buying stocks and shares or investing in a bank!
- Buy equipment/machinery or build new plant to:
  - Increase capacity (amount that can be produced) which means:
  - Demand can be met and this generates sales revenue
  - Increased efficiency and productivity

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A fork lift may be an important item but what does it contribute to overall sales?

How long and how much work would it have to do to repay its initial cost?

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Payback period

- refers to the period of time for an investment project to earn enough profits to repay the cost of the initial investment.
- the formula for calculating the payback period is:

$$\frac{\text{initial investment (\$)}}{\text{contribution per month (\$)}}$$

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Payback period – Example

- A firm is considering the purchase of a new photocopier equipment at a cost of $10,000. The anticipated financial gain that this would bring is $6,000 of revenue per year after maintenance costs are paid for.
- The payback period would be:

$$\frac{\$10{,}000}{\left(\frac{\$6{,}000}{12 \text{ months}}\right)} = 20 \text{ months}$$

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Payback period

- Most investment projects will only be considered if they have a relatively short payback period.
- In the previous example, 20 months may seem to be as acceptable for a short payback period.
- The business does not want to purchase the expensive photocopier equipment and find that it is obsolete before the payback period.

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Payback period

- In reality, it is unlikely that the income stream will be constant each year.
- It is still possible though to work out the payback period using the *cumulative cash flow method*.

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Payback period – Example

Suppose that the construction of a new sports complex that costs $1,000,000 is expected to generate the following net cash flows over the first four years:

Year 1 $210,000

Year 2 $350,000

Year 3 $480,000

Year 4 $450,000

What is the payback period?

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	Net cash inflow	Cumulative cash inflow
Year 1	$210,000	$210,000
Year 2	$350,000	$560,000
Year 3	$480,000	$1,040,000
Year 4	$450,000	$1,490,000

They payback period (for the initial $1 m) happens between years 2 and 3 (within the 3rd year).

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	Net cash inflow	Cumulative cash inflow
Year 1	$210,000	$210,000
Year 2	$350,000	$560,000
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Year 4	$450,000	$1,490,000

To work out the payback period:

a.Calculate the difference between the cumulative net cash inflow in year 2 and the amount invested:
($1,000,000 - $560,000) = $440,000

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Year 1	$210,000	$210,000
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Year 4	$450,000	$1,490,000

b.Calculate the average monthly cash inflow in year 3:
($480,000 ÷ 12 months) = $40,000 per month

c.Divide (a) by (b) to find out the number of months:
($440,000 ÷ $40,000) = 11 months

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Year 1	$210,000	$210,000
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Thus, the payback period for the sports complex is forecast to be 2 years and 11 months.

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Payback period - Advantages

- It is the simplest and quickest method of investment appraisal.
- Can be useful for firms with cash flow problems as such firms can identify how long it will take for the cash to be recouped.
- Can be used to compare different investment projects with different costs by calculating the quickest payback period of each option.

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Payback period – Advantages

- Helps to access projects which will yield a quick return for shareholders.
- Assesses only the short term, so payback calculations are less prone to forecasting errors.

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Payback period – Disadvantages

- May encourage a *short-termism* approach to investment, where managers only focus on the short-term benefits and ignore the potential gains in the longer term.

  For example

  Property developers have to risk a huge amount of capital when building on a new site. The costs are unlikely to be recouped for several years to come. Hence, payback period may not be the most suitable method of investment appraisal for such firms.

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Accounting rate of return (ARR)

- ARR calculates the average profit of an investment as a percentage of the amount invested.
- The formula for calculating ARR is:

$$\frac{\dfrac{\text{total profit during projects}}{\text{number of years of project}} \times 100}{\text{initial amount invested (\$)}}$$

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Accounting rate of return (ARR)

- ARR is expressed as a percentage to allow managers to compare the rates of return on other investment projects.
- As a basic benchmark, the ARR can be compared with base interest rate to assess the rewards for the risk involved in an investment.

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ARR– Example

Steps

a. Total net cash inflow over the five years is $700,000

b. Project profit = $700,000 - $400,000 (initial investment)
= $300,000

c. Average annual profit = $300,000 ÷ 5 = $60,000 per year

d. Hence, the ARR = $60,000 ÷ $400,000 = 15%

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ARR– Example

Comparing 15% with the base interest rate allows us to see whether the project is worth the risk. If banks are offering a 5% return, then this particular project seems relatively attractive.

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ARR– Advantages

- It enables easy comparisons (in percentage terms) of the forecast proceeds of different investment projects, thereby aiding business decision-making.

  For example

- If two projects are forecast to yield the same ARR, then the relatively cheaper project may be more desirable given that it carries less financial risk.

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ARR– Disadvantages

- It ignores the timing of cash inflows and hence is prone to forecasting errors when considering seasonal factors.
- The project's useful life with all time-based forecasts, errors are more likely, the longer the time period that is under consideration.

Acknowledgement

- Paul, Hoang, *Business and Management*, Victoria: IBID Press, 2007