3.8 Investment appraisal

Evaluation of investment appraisal

This subtopic has analysed several quantitative methods of investment appraisal: the payback period, average rate of return and net present value (HL only). Businesses use this information to compare potential investments. For example, instead of investing $200 000 in a new machine, a business could choose to build a new facility or spend on research and development. If the business is prioritising profits, then it may choose investments that have a short payback period, or higher average rate of return or net present value (HL).

Figure 1. Businesses need tools to evaluate investment options.

Credit: Sadeugra, Getty Images

Imagine that you run a small local hospital that treats a low-income population (a social enterprise) and you are considering purchasing a magnetic resonance imaging (MRI) machine. Such a machine may cost up to $3 million. It is a significant investment for the hospital. The hospital's administration would need to consider a variety of quantitative and qualitative factors, such as:

- **Return on investment**. What return on investment would the hospital want to obtain?

- **Cost savings**. Would purchasing this machine lead to cost savings in other diagnostic procedures? These cost savings may not be immediately evident when looking simply at return on investment.
- **Break-even**. Most social enterprises should attempt to break even. Would such a large investment prevent the hospital from breaking even for several years?
- **Market share**. Would being the first hospital in the region to have this machine increase the inflow of patients who will use this and other hospital services? This could increase the hospital's market share (and possibly profitability)?
- **Financing**. What kind of financing could the hospital obtain if it were to take out a loan? What would the terms of such a loan be? If the average rate of return on the investment is higher than the interest rate on the loan, it may be a wise investment.
- **Cash flow assumptions**. How confident is the business in its cash flow assumptions? Having incorrect assumptions could result in the investment having a lower rate of return than estimated.
- **The hospital's mission statement**. If the hospital's mission is to provide a high-quality diagnostic service to a low-income population, then a low ARR or a long payback period may not be a pressing concern compared to the quality of service provided to meet human needs.

Figure 2. Qualitative and quantitative considerations need to be considered when making a significant investment.

Credit: Thomas Barwick, Getty Images

Investment is not always a choice. Businesses may also need to make investments because of regulations imposed on them. For example, environmental protection laws may require additional investment in technology to lower a business's pollution emissions. Although positive for society and the environment, such an investment may negatively affect cash flow in the short term.

Figure 3. Certain investments – such as in modern fire alarm systems – need to be made because of government regulations.

Credit: Rapeepong Puttakumwong, Getty Images

Businesses may, however, have even more choices for spending their retained profits than investments. They may also use the cash to:

- pay down debts to lower risk and interest payments
- pay dividends to their shareholders
- buy back shares of their own company to boost the stock price

Making connections

In Section 3.3.4 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/tool-decision-tree-id-39304) you learned about the decision tree tool.

This tool can be combined with the three methods outlined here, as well as additional decisions, to come up with the best path for a business to take.

A decision tree can also help investors evaluate risk. A highly profitable but improbable outcome would be reflected in the decision tree with a lower probability of success.

Qualitative techniques

Most investment decisions are based on more than quantitative data. Businesses use a variety of tools to evaluate an investment. You have learned or will learn about all of the following qualitative tools, which can be combined with the investment appraisal techniques from this subtopic:

- **Product life cycle (Section 4.5.1 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/product-life-cycle-id-39005))**. This is the product in the growth or maturity phase. If the company believes that sales are going to grow rapidly in the future, as in the case of Samsung mentioned in Section 3.8.0 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/the-big-picture-id-39324), then investment should proceed.
- **Boston Consulting Group (BCG) matrix (Section 4.1.6 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/tool-bcg-matrix-id-37441))**. Products that are deemed to be stars are predicted to have a bright future, so will normally be priorities for investment funds.
- **STEEPLE analysis (Section 1.1.6 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/tool-business-plan-id-36505))**. Results from external analysis may point to future opportunities. It is important to consider the level of risk when an economy is or is not growing. In case of a multinational company, it may be beneficial to look at other external risk factors, such as sovereign ratings.
- **Product portfolio analysis (Subtopic 4.5 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-174702/book/the-big-picture-id-39004))**. This may point towards a gap in a product portfolio that needs to be filled with investment in a new product.
- **Market research results (Subtopic 4.4 (/study/app/y12-business-management-a-hl-may-2024/sid-351-cid-**

174702/book/the-big-picture-id-38995)). Results from interviews or focus groups may point towards a growing market that could be targeted.

When it comes to social enterprises, different qualitative and quantitative data may be used, depending on the social or environmental objectives of the business. For example, schools may use graduation rates when investing in a new safer facility. Non-profit health institutions may look at hospital readmissions after procedures or other health outcomes. Even where two businesses use the same quantitative and qualitative data to inform decisions, social enterprises are likely to place more weight on qualitative data that reflects positive impact.

Case study

South Korean multinational company Kia made a large $1 billion investment in an automobile production facility in Georgia, USA in 2006. This facility was chosen because of its relatively low cost of production, tax benefits and location. (It was close to major highways for easy transportation of products.) Georgia's weak labour laws and proximity to other related manufacturers were also a factor in the investment. Further, the state of Georgia offered tax breaks and other financial incentives of more than $79 million, with additional tax benefits over future years of operation.

This large capital investment allowed Kia to increase the number of vehicles sold in the USA from 294 302 (in 2006) to 677 494 (in 2021).

(Source: Goodcarbadcar (https://www.goodcarbadcar.net/kia-us-sales-figures/#growth https://www.fdiintelligence.com/article/28832))

Questions

1. Describe two qualitative factors that contributed to making the decision to invest in a production factory in Georgia. [2 marks]
2. Calculate the growth (percentage change) in Kia vehicle sales from 2006 to 2021. [2 marks]
3. Comment on the appropriateness of Kia's investment in Georgia. [2 marks]

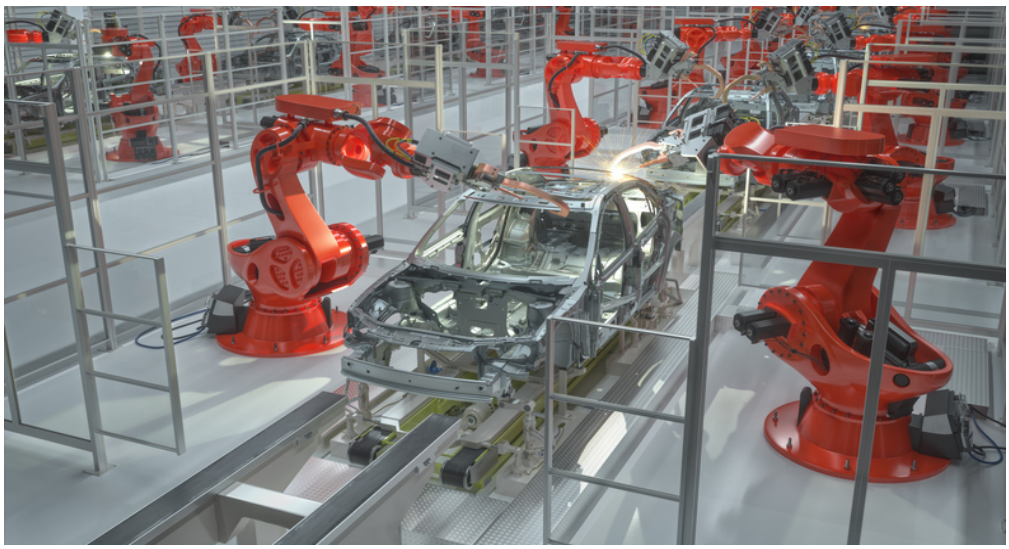

Figure 4. Kia made a large investment in a factory in Georgia, USA.
Credit: xia yuan, Getty Images

Activity

Learner profile: Thinkers
Approaches to learning: Thinking skills (transfer)

Politooth is a manufacturing facility in Thailand that produces custom made dental implants through the 3D printing process. Politooth has been contracted recently by the Thai government, which has been outsourcing the dental care it provides for its staff to private companies.

Politooth is deciding whether to invest in additional 3D printers. The printers cost 3 million THB and should provide at least five years of active use.

The net cash flows are as follows:

Year	1	2	3	4	5
Forecast annual net cash flow (in THB)	650000	790000	650000	800000	400000

Questions

1. Calculate
   - the payback period
   - the average rate of return (ARR)
   - NPV at a discount rate of 4% (HL only)

2. Comment on your answer from one of the calculations in question 1.

3. What qualitative data might Politooth use in conjunction with the investment appraisals above in order to make an investment decision?

Theory of Knowledge

In this subtopic you have been introduced to two (SL) or three (HL) quantitative investment appraisal methods. In addition to quantitative methods, companies also look at qualitative methods to make an investment decision.

- To what extent are the methods used to gain knowledge in investment appraisal 'scientific'? (IB Business Management guide)